

Apéndice 6-4 Desglose de Construcción de Puentes

1.

Unit : \$

Name of Bridges		L. C.		F. C.	Total
		Duties	Others		
Point A Br. ( $\varnothing = 132.5m$ )	Spr.S (B)	174074	195257	516789	886120
	Sub.S (A)	4125	12273	10146	26544
	(P)	37114	89325	97655	224094
	Subtotal	215313	296855	624590	1136758
Putini Br. ( $\varnothing = 40.0m$ )	Spr.S (B)	21502	34974	62124	118600
	Sub.S (A)	4612	18446	14121	37179
	(P)	3368	9156	8478	21002
	Subtotal	29482	62576	84723	176781
Challa Br. ( $\varnothing = 20.0m$ )	Spr.S (I)	10839	17006	31660	59505
	Sub.S (A)	5287	15470	13714	34471
	Subtotal	16126	32476	45374	93976
Cascada Br. ( $\varnothing = 18.0m$ )	Spr.S (I)	8877	14953	25813	49643
	Sub.S (A)	3973	12531	9459	25963
	Subtotal	12850	27484	35272	75606
Alto Choro Br. ( $\varnothing = 50.0m$ )	Spr.S (B)	41236	53891	128976	224103
	Sub.S (A)	5930	17769	14547	38246
	(P)	2989	7949	7587	18525
	Subtotal	50155	79609	151110	280874
Pto Leon Br. ( $\varnothing = 75.0m$ )	Spr.S (B)	40733	65842	117659	224234
	Sub.S (A)	8169	24891	19871	52931
	(P)	6030	16404	15170	37604
	Subtotal	54932	107137	152700	314769
Cajones Br. ( $\varnothing = 25.0m$ )	Spr.S (I)	13612	21701	39678	74991
	Sub.S (A)	4725	14555	12383	31663
	Subtotal	18337	36256	52061	106654
Chojna Br. ( $\varnothing = 22.0m$ )	Spr.S (I)	9528	15165	27768	52461
	Sub.S (A)	4492	12598	11341	28431
	Subtotal	14020	27763	39109	80892
San Silverio Br. ( $\varnothing = 50.0m$ )	Spr.S (B)	41236	53891	128976	224103
	Sub.S (A)	9740	28516	24135	62391
	(P)	4258	11507	10742	26507
	Subtotal	55234	93914	163853	313001
San Lorenzo Br. ( $\varnothing = 52.0m$ )	Spr.S (B)	43347	56709	135550	235606
	Sub.S (A)	7669	23526	18614	49809
	(P)	7602	18473	19305	45380
	Subtotal	58618	98708	173469	330795

2.

Unit : \$

Name of Bridges		L. C.		F. C.	Total
		Duties	Others		
Espiritu Br. ( $\ell = 52.0\text{m}$ )	Spr.S (B)	43347	56709	135550	235606
	Sub.S (A)	6245	19416	15069	40730
	(P)	8639	22555	22069	53263
	Subtotal	58231	98680	172688	329599
Carrasco Br. ( $\ell = 30.0\text{m}$ )	Spr.S (I)	21917	34423	64125	120465
	Sub.S (A)	14358	43862	34718	92938
	Subtotal	36275	78285	98843	213403
Avaroa Br. ( $\ell = 25.0\text{m}$ )	Spr.S (I)	20878	27006	65476	113360
	Sub.S (A)	2354	7572	5583	15509
	Subtotal	23232	34578	71059	128869

note Spr.S : Superstructure  
 Sub.S : Substructure  
 I : PCI-compsite Girder  
 B : Box Girder  
 A : Abutment  
 P : Pier



Patuni Bridge ( $\varnothing=40.0m$ )										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
I-Girder	Type-P	m <sup>3</sup>	70.8	142.55	177.84	416.83	10092.54	12591.07	29511.56	
Cross Beam	Type-A	m <sup>3</sup>	22.324	48.71	122.24	120.49	1087.40	2728.89	2689.82	
Slab	Type-A	m <sup>3</sup>	88.974	70.61	153.98	178.50	6282.45	13700.22	15881.86	
Erection		Ton	177	10.99	15.66	45.11	1945.23	2771.82	7984.47	
Shoe		Set	10	42.66	15.36	126.77	426.6	153.6	1267.7	
Handrail		m	79.76	16.66	35.43	42.38	1328.80	2825.90	3380.23	
Expansion Joint		m	24.8	9.12	3.60	25.00	226.18	89.28	620.0	
Drainage		Set	10	0.58	5.02	-	5.8	50.2	-	
Newel Post		Set	1.0	107.17	63.08	788.83	107.17	63.08	788.83	
Total							21502.0	34974.0	62124.0	

Challa Bridge ( $\varnothing=20.0m$ )										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
I- Girder	Type-P	m <sup>3</sup>	35.4	142.55	177.84	416.83	5046.27	6295.54	14755.78	
Cross Beam	Type-A	m <sup>3</sup>	11.162	48.71	122.24	120.49	543.70	1364.44	1344.91	
Slab	Type-A	m <sup>3</sup>	40.339	70.61	153.98	178.50	2848.34	6211.40	7200.51	
Shoe		Set	10	42.66	15.36	126.77	426.6	153.6	1267.7	
Handrail		m	39.88	16.66	35.43	42.38	664.40	1412.95	1690.11	
Expansion Joint		m	24.8	9.12	3.60	25.00	226.18	89.28	620.0	
Drainage		Set	6	0.58	5.02	-	3.48	30.12	-	
Newel Post		Set	1	107.17	63.08	788.83	107.17	63.08	788.83	
Erection		Ton	88.5	10.99	15.66	45.11	972.62	1385.91	3992.24	
Total							10839.0	17006.0	31660.0	

Cascada Bridge (Ø=18.5m)										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
I-Girder	Type-P	m³	26.912	142.55	177.84	416.83	3836.30	4786.03	11217.73	
Cross Beam	Type-A	m³	9.761	48.71	122.24	120.49	475.46	1193.18	1176.10	
Slab	Type-A	m³	36.234	70.61	153.98	178.50	2558.48	5579.31	6467.77	
Shoe		Set	8	42.66	15.36	126.77	341.28	122.88	1014.16	
Handrail		m	36.88	16.66	35.43	42.38	614.42	1306.66	1562.97	
Expansion Joint		m	22.0	9.12	3.60	25.00	290.64	79.20	550.0	
Drainage		Set	6	0.58	5.02	-	3.48	30.12	-	
Neswel		Set	1.0	107.17	63.08	788.83	107.17	63.08	788.83	
Erection		Ton	67.28	10.99	15.66	45.11	739.41	1793.01	3035.0	
Total							8877.0	14953.0	25813.0	

Alto Choro Bridge (Ø=50m)										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Main Girder	Type-P	m³	280.218	109.73	137.75	319.08	30748.32	38600.03	89411.96	
Pavement		m²	9.13	15.38	61.57	37.73	140.42	562.13	344.47	
Shoe		set	9	79.91	15.72	240.26	719.19	141.48	2162.34	
Handrail		m	96.076	16.66	35.43	42.38	1600.63	3403.97	4071.70	
Exponson Joint		m	23.0	9.12	3.60	25.00	209.76	82.8	575.0	
Drainage		set	12	0.58	5.02	-	6.96	60.24	-	
Newel Post		set	1.0	107.17	63.08	788.83	107.17	63.08	788.83	
Erection		Ton	701	10.99	15.06	45.11	7703.99	10977.66	31622.11	
Total							41236.0	53891.0	128976.0	

Pto Leon Bridge (Ø=75.0m)										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
I-Girder	Type-P	m³	138.0	142.55	177.84	416.83	19671.90	24541.92	57522.54	
Cross Beam	Type-A	m³	40.569	48.71	122.24	120.49	1976.12	4959.15	4888.16	
Slab	Type-A	m³	162.732	70.61	153.98	178.50	11490.51	25057.47	29047.66	
Shoe		Set	24	42.66	15.36	126.77	1023.84	368.64	3042.48	
Handrail		m	149.64	16.66	35.43	42.38	2993.00	5301.75	6341.74	
Expansion Joint		m	18.60	9.12	3.60	25.00	169.63	66.96	465.0	
Drainage		Set	16	0.58	5.02	-	9.28	80.32	-	
Neswel		Set	1.0	107.17	63.08	788.83	107.17	63.08	788.83	
Erection		Ton	345	10.99	15.66	45.11	3791.55	5402.70	15562.95	
Total							40733.0	65842.0	117659.0	

Cajones Bridge (Ø=25.0m)										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
I-Girder	Type-P	m³	46.0	142.55	177.84	416.83	6557.30	8180.64	19174.18	
Cross Beam	Type-A	m³	16.30	48.71	122.24	120.49	793.973	1992.51	1963.99	
Slab	Type-A	m³	49.775	70.61	153.98	178.50	3514.61	7664.35	8884.84	
Shoe		Set	8	42.66	15.36	126.77	341.28	122.88	1014.16	
Handrail		m	49.88	16.66	35.43	42.38	831.00	1767.25	2113.91	
Expansion Joint		m	22.0	9.12	3.60	25.00	200.64	79.2	550.0	
Drainage		Set	6	0.58	5.02	-	3.48	30.12	-	
Neswel		Set	1.0	106.17	63.08	788.83	106.17	63.08	788.83	
Erection		Ton	115	10.99	15.66	45.11	1263.85	1800.9	5187.65	
Total							13612.0	21701.0	39678.0	

Chojña Bridge (Ø=22.0m)										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
I-Girder	Type-P	m <sup>3</sup>	30.028	142.55	177.84	416.83	4280.49	5340.18	12516.57	
Cross Beam	Type-A	m <sup>3</sup>	10.785	48.71	122.24	120.49	525.34	1318.36	1299.48	
Slab	Type-A	m <sup>3</sup>	35.593	70.61	153.98	178.50	2513.22	5480.61	6353.35	
Shoe		Set	8	42.06	15.36	126.77	341.28	122.88	1014.16	
Handrail		m	43.88	16.66	35.43	42.38	731.04	1554.67	1859.63	
Expansion Joint		m	22.0	9.12	3.60	25.00	200.64	79.20	550.0	
Drainage		Set	6	0.58	5.02	-	3.48	30.12	-	
Neswel		Set	1.0	107.17	63.08	788.83	107.17	63.08	788.83	
Erection		Ton	75.07	10.99	15.66	45.11	825.02	1175.80	3386.41	
Total							9528.0	15165.0	27768.0	

San Silverio Bridge (Ø=50m)										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Main Girder	Type-P	m <sup>3</sup>	280.218	109.73	137.75	319.08	30748.32	38600.03	89411.96	
Pavement		m <sup>2</sup>	9.13	15.38	61.57	37.73	140.42	562.13	344.47	
Shoe		set	9	79.91	15.72	240.26	719.19	141.48	2162.34	
Handrail		m	96.076	16.66	35.43	42.38	1600.63	3403.97	4071.70	
Exponson Joint		m	23.0	9.12	3.60	25.00	209.76	82.8	575.0	
Drainage		set	12	0.58	5.02	-	6.96	60.24	-	
Newel Post		set	1.0	107.17	63.08	788.83	107.17	63.08	788.83	
Erection		Ton	701	10.99	15.06	45.11	7703.99	10977.66	31622.11	
Total							41236.0	53891.0	128976.0	

San Lorenzo Bridge (Ø=50m)										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Main Girder	Type-P	m <sup>3</sup>	294.94	109.73	137.75	319.08	32363.77	40627.99	94109.46	
Pavement		m <sup>2</sup>	9.65	15.38	61.57	37.73	148.42	594.15	364.09	
Shoe		set	9.00	79.91	15.72	240.26	719.19	141.48	2162.34	
Handrail		m	101.556	16.66	35.43	42.38	1691.92	3598.13	4303.94	
Expension Joint		m	23.0	9.12	3.60	25.0	209.76	82.8	575	
Drainage		set	12	0.58	5.02	-	6.96	60.24	-	
Newel Post		set	1.0	107.17	63.08	788.83	107.17	63.08	788.83	
Erection		Ton	737	10.99	15.66	45.11	8099.63	11541.42	33246.07	
Total							43347.0	56709.0	135550.0	

Espiritu Bridge (Ø=50m)										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Main Girder	Type-P	m <sup>3</sup>	294.94	109.73	137.75	319.08	32363.77	40627.99	94109.46	
Pavement		m <sup>2</sup>	9.65	15.38	61.57	37.73	148.42	594.15	364.09	
Shoe		set	9.00	79.91	15.72	240.26	719.19	141.48	2162.34	
Handrail		m	101.556	16.66	35.43	42.38	1691.92	3598.13	4303.94	
Expension Joint		m	23.0	9.12	3.60	25.0	209.76	82.8	575	
Drainage		set	12	0.58	5.02	-	6.96	60.24	-	
Newel Post		set	1.0	107.17	63.08	788.83	107.17	63.08	788.83	
Erection		Ton	737	10.99	15.66	45.11	8099.63	11541.42	33246.07	
Total							43347.0	56709.0	135550.0	



Carrasco Bridge (Ø=30.0m)										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
T-Girder	Type-P	m³	80.385	142.55	177.84	416.83	11458.88	14295.67	33506.88	
Cross Beam	Type-A	m³	25.585	48.71	122.24	120.49	1246.25	3127.51	3082.74	
Slab	Type-A	m³	73.952	70.61	153.98	178.50	5221.75	11387.13	13200.43	
Shoe		Set	10	42.06	15.36	126.77	426.6	153.6	1267.7	
Handrail		m	59.88	16.66	35.43	42.38	997.60	2121.55	2537.71	
Expansion Joint		m	27.0	9.12	3.60	25.00	246.24	97.2	675.0	
Drainage		Set	6	0.58	5.02	-	3.48	30.12	-	
Newel Post		Set	1.0	107.17	63.08	788.83	107.17	63.08	788.83	
Erection		Ton	200.96	10.99	15.66	45.11	2208.55	3147.03	9065.31	
Total							21917.0	34423.0	64125.0	

Avaroa Bridge (Ø=25m)										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Main Girder	Type-P	m³	140.109	109.73	137.75	319.08	15374.16	19300.01	44705.98	
Pavement		m²	4.50	15.38	61.57	37.73	69.21	277.07	169.79	
Shoe		set	6	79.91	15.72	240.06	479.46	94.32	1441.56	
Handrail		m	47.338	16.66	35.43	42.38	788.65	1677.19	2006.18	
Exponcion Joint		m	23.0	9.12	3.60	25.00	209.76	82.8	575.0	
Drainage		set	6	0.58	5.02	-	3.48	30.12	-	
Newel Post		set	1	107.17	63.08	788.83	107.17	63.08	788.83	
Erection		Ton	350	10.99	15.66	45.11	3846.5	5481.0	15788.50	
Total							20878.0	27006.0	65476.0	

II. Substructure

Point A Abutment										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Excavation		m <sup>3</sup>	247.4	1.65	6.98	3.31	408.21	1726.85	818.89	
Concrete	Type-A	m <sup>3</sup>	122.10	13.49	49.85	34.71	1647.13	6086.69	4238.09	
Leveling Concrete	Type-D	m <sup>3</sup>	6.60	5.27	34.35	8.14	34.78	226.71	53.72	
Concrete Mixing		m <sup>3</sup>	122.10	0.84	5.71	0.78	102.56	697.19	95.24	
Concrete Placing		m <sup>3</sup>	122.10	0.75	3.15	1.51	91.58	384.62	184.37	
Reinforcement Bar		Ton	6.72	233.81	127.98	694.18	1571.20	860.03	4664.89	
Form		m <sup>2</sup>	236.86	0.67	6.23	0.04	158.70	1475.64	9.47	
Staging		Spc·m <sup>3</sup>	181.06	0.61	4.50	0.45	110.45	814.77	81.48	
Total							4125.0	12273.0	10146.0	

Point A Pier										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Excavation		m <sup>3</sup>	334.00	1.65	6.98	3.31	551.10	2331.32	1105.54	
Concrete	Type-A	m <sup>3</sup>	1117.10	13.49	49.85	34.71	15069.68	55687.44	38774.54	
Leveling Concrete	Type-D	m <sup>3</sup>	28.62	5.27	34.35	8.14	150.83	983.10	232.97	
Concrete Mixing		m <sup>3</sup>	1117.10	0.84	5.71	0.78	938.36	6378.64	871.34	
Concrete Placing		m <sup>3</sup>	1117.10	0.75	3.15	1.51	837.83	3518.87	1686.82	
Reinforcement Bar		Ton	78.20	233.81	127.98	694.18	18283.34	10008.04	54284.88	
Form		m <sup>2</sup>	742.60	0.67	6.23	0.04	497.54	4626.40	29.70	
Staging		Spc·m <sup>3</sup>	1287.00	0.61	4.50	0.45	785.07	5791.50	579.15	
Total							37114.0	89325.0	97655.0	

Patuni Abutment										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Excavation		m <sup>3</sup>	851.00	1.65	6.98	3.31	1404.15	5939.98	2816.81	
Concrete	Type-A	m <sup>3</sup>	147.71	13.49	49.85	34.71	1992.61	7363.34	5127.01	
Leveling Concrete	Type-D	m <sup>3</sup>	12.83	5.27	34.35	8.14	67.61	440.71	104.40	
Concrete Mixing		m <sup>3</sup>	147.71	0.84	5.71	0.78	124.08	843.42	115.21	
Concrete Placing		m <sup>3</sup>	147.71	0.75	3.15	1.51	110.78	465.29	223.04	
Reinforcement Bar		Ton	8.12	233.81	127.98	694.18	1898.54	1039.20	5636.74	
Form		m <sup>2</sup>	236.76	0.67	6.23	0.04	158.63	1475.01	9.47	
Staging		Spc·m <sup>3</sup>	195.28	0.61	4.50	0.45	119.12	878.76	87.88	
Total							4612.0	18446.0	14121.0	

Patuni Pier										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Excavation		m <sup>3</sup>	205.20	1.65	6.98	3.31	338.58	1432.30	679.21	
Concrete	Type-A	m <sup>3</sup>	89.98	13.49	49.85	34.71	1213.83	4485.50	3123.21	
Leveling Concrete	Type-D	m <sup>3</sup>	3.00	5.27	34.35	8.14	15.81	103.05	24.42	
Concrete Mixing		m <sup>3</sup>	89.98	0.84	5.71	0.78	75.58	513.79	70.18	
Concrete Placing		m <sup>3</sup>	89.98	0.75	3.15	1.51	67.49	283.44	135.87	
Reinforcement Bar		Ton	6.30	233.81	127.98	694.18	1473.00	806.27	4373.33	
Form		m <sup>2</sup>	139.58	0.67	6.23	0.04	93.52	869.58	5.58	
Staging		Spc·m <sup>3</sup>	147.12	0.61	4.50	0.45	89.74	662.04	66.20	
Total							3368.0	9156.0	8478.0	

Challa Abutment										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Excavation		m <sup>3</sup>	279.70	1.65	6.98	3.31	461.51	1952.31	925.81	
Concrete	Type-A	m <sup>3</sup>	159.14	13.49	49.85	34.71	2146.80	7933.13	5523.75	
Leveling Concrete	Type-D	m <sup>3</sup>	8.07	5.27	34.35	8.14	42.53	227.20	65.69	
Concrete Mixing		m <sup>3</sup>	159.14	0.84	5.71	0.78	133.68	908.69	124.13	
Concrete Placing		m <sup>3</sup>	159.14	0.75	3.15	1.51	119.36	501.29	240.30	
Reinforcement Bar		Ton	8.75	233.81	127.98	694.18	2045.84	1119.83	6074.08	
Form		m <sup>2</sup>	262.07	0.67	6.23	0.04	175.59	1632.70	10.48	
Staging		Spc·m <sup>3</sup>	265.52	0.61	4.50	0.45	161.97	1194.84	119.48	
Total							5287.0	15470.0	13714.0	

Cascada Abutment										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Excavation		m <sup>3</sup>	506.70	1.65	6.98	3.31	836.06	3536.77	1617.18	
Concrete	Type-A	m <sup>3</sup>	102.36	13.49	49.85	34.71	1380.84	5102.65	3552.92	
Leveling Concrete	Type-D	m <sup>3</sup>	8.06	5.27	34.35	8.14	42.48	276.86	65.61	
Concrete Mixing		m <sup>3</sup>	102.36	0.84	5.71	0.78	85.98	584.48	79.84	
Concrete Placing		m <sup>3</sup>	120.36	0.75	3.15	1.51	76.77	322.43	154.56	
Reinforcement Bar		Ton	5.63	233.81	127.98	694.18	1316.35	720.53	3908.23	
Form		m <sup>2</sup>	202.38	0.67	6.23	0.04	135.59	1260.83	8.10	
Staging		Spc·m <sup>3</sup>	161.40	0.61	4.50	0.45	98.45	726.30	72.63	
Total							3973.0	12531.0	9459.0	

Alto Choro Abutment										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Excavation		m <sup>3</sup>	534.70	1.65	6.98	3.31	882.26	3732.21	1769.86	
Concrete	Type-A	m <sup>3</sup>	167.71	13.49	49.85	34.71	2262.41	8360.34	5821.21	
Leveling Concrete	Type-D	m <sup>3</sup>	7.70	5.27	34.35	8.14	40.58	264.50	62.68	
Concrete Mixing		m <sup>3</sup>	167.71	0.84	5.71	0.78	140.88	957.62	130.81	
Concrete Placing		m <sup>3</sup>	167.71	0.75	3.15	1.51	125.78	528.29	253.24	
Reinforcement Bar		Ton	9.22	233.81	127.98	694.18	2155.73	1179.98	6400.34	
Form		m <sup>2</sup>	283.90	0.67	6.23	0.04	190.21	1768.70	11.36	
Staging		Spc·m <sup>3</sup>	217.28	0.61	4.50	0.45	132.54	977.76	97.78	
Total							5930.0	17769.0	14547.0	

Alto Choro Pier										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Excavation		m <sup>3</sup>	113.90	1.65	6.98	3.31	187.94	795.02	377.01	
Concrete	Type-A	m <sup>3</sup>	83.18	13.49	49.85	34.71	1122.10	4146.52	2887.18	
Leveling Concrete	Type-D	m <sup>3</sup>	3.20	5.27	34.35	8.14	16.86	109.92	26.05	
Concrete Mixing		m <sup>3</sup>	83.18	0.84	5.71	0.78	69.87	474.96	64.88	
Concrete Placing		m <sup>3</sup>	83.18	0.75	3.15	1.51	62.39	262.02	125.60	
Reinforcement Bar		Ton	5.82	233.81	127.98	694.18	1360.77	744.84	4040.13	
Form		m <sup>2</sup>	129.03	0.67	6.23	0.04	86.45	803.86	5.16	
Staging		Spc·m <sup>3</sup>	136.00	0.61	4.50	0.45	82.96	612.00	61.20	
Total							2989.0	7949.0	7587.0	

Pto Leon Abutment										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Excavation		m <sup>3</sup>	712.40	1.65	6.98	3.31	1175.46	4972.55	2358.04	
Concrete	Type-A	m <sup>3</sup>	228.73	13.49	49.85	34.71	3085.57	11402.19	7939.22	
Leveling Concrete	Type-D	m <sup>3</sup>	9.68	5.27	34.35	8.14	51.01	332.51	78.80	
Concrete Mixing		m <sup>3</sup>	228.73	0.84	5.71	0.78	192.13	1306.05	178.41	
Concrete Placing		m <sup>3</sup>	228.73	0.75	3.15	1.51	171.55	720.50	345.38	
Reinforcement Bar		Ton	12.58	233.81	127.98	694.18	2941.33	1609.99	8732.78	
Form		m <sup>2</sup>	370.54	0.67	6.23	0.04	248.26	2308.46	14.82	
Staging		Spc·m <sup>3</sup>	497.56	0.61	4.50	0.45	303.51	2239.02	223.90	
Total							8169.0	24891.0	19871.0	

Pto Leon Pier										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Excavation		m <sup>3</sup>	318.00	1.65	6.98	3.31	524.70	2219.64	1052.58	
Concrete	Type-A	m <sup>3</sup>	162.21	13.49	49.85	34.71	2188.21	8086.17	5630.31	
Leveling Concrete	Type-D	m <sup>3</sup>	6.00	5.27	34.35	8.14	31.62	206.10	48.87	
Concrete Mixing		m <sup>3</sup>	162.21	0.84	5.71	0.78	136.26	926.22	126.52	
Concrete Placing		m <sup>3</sup>	162.21	0.75	3.15	1.51	121.66	510.96	244.94	
Reinforcement Bar		Ton	11.35	233.81	127.98	694.18	2653.74	1452.57	7878.94	
Form		m <sup>2</sup>	192.04	0.67	6.23	0.04	128.67	1196.41	7.68	
Staging		Spc·m <sup>3</sup>	401.28	0.61	4.50	0.45	244.78	1805.76	180.58	
Total							6030.0	16404.0	15170.0	

Cajones Abutment										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Excavation		m <sup>3</sup>	161.60	1.65	6.98	3.31	266.64	1127.97	543.90	
Concrete	Type-A	m <sup>3</sup>	154.88	13.49	49.85	34.71	2089.33	7720.77	5375.88	
Leveling Concrete	Type-D	m <sup>3</sup>	7.36	5.27	34.35	8.14	38.79	252.82	59.91	
Concrete Mixing		m <sup>3</sup>	154.88	0.84	5.71	0.78	130.10	884.36	120.81	
Concrete Placing		m <sup>3</sup>	154.88	0.75	3.15	1.51	116.16	487.87	233.87	
Reinforcement Bar		Ton	8.52	233.81	127.98	694.18	1992.06	1091.39	5914.41	
Form		m <sup>2</sup>	266.80	0.67	6.23	0.04	178.76	1662.16	10.67	
Staging		Spc·m <sup>3</sup>	295.27	0.61	4.50	0.45	180.11	1328.72	132.87	
Total							4992.0	14555.0	12383.0	

Chojña Abutment										
Por pilote										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Excavation		m <sup>3</sup>	142.60	1.65	6.98	3.31	235.29	995.35	472.01	
Concrete	Type-A	m <sup>3</sup>	142.88	13.49	49.85	34.71	1927.45	7122.57	4959.36	
Leveling Concrete	Type-D	m <sup>3</sup>	8.40	5.27	34.35	8.14	44.27	288.54	68.38	
Concrete Mixing		m <sup>3</sup>	142.88	0.84	5.71	0.78	120.02	815.84	111.45	
Concrete Placing		m <sup>3</sup>	142.88	0.75	3.15	1.51	107.16	450.07	215.75	
Reinforcement Bar		Ton	7.86	233.81	127.98	694.18	1837.75	1005.92	5456.25	
Form		m <sup>2</sup>	229.65	0.67	6.23	0.04	153.86	1430.72	9.19	
Staging		Spc·m <sup>3</sup>	108.66	0.61	4.50	0.45	66.28	488.97	48.90	
Total							4492.0	12598.0	11341.0	

San Silverio Abutment										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Excavation		m <sup>3</sup>	748.30	1.65	6.98	3.31	1234.70	5223.13	2476.87	
Concrete	Type-A	m <sup>3</sup>	284.48	13.49	49.85	34.71	3837.64	14181.33	9874.30	
Leveling Concrete	Type-D	m <sup>3</sup>	11.00	5.27	34.35	8.14	57.97	377.85	89.54	
Concrete Mixing		m <sup>3</sup>	284.48	0.84	5.71	0.78	238.96	1624.38	221.89	
Concrete Placing		m <sup>3</sup>	284.48	0.75	3.15	1.51	213.36	896.11	429.56	
Reinforcement Bar		Ton	15.65	233.81	127.98	694.18	3659.13	2002.89	10863.92	
Form		m <sup>2</sup>	414.46	0.67	6.23	0.04	277.69	2582.09	16.58	
Staging		Spc·m <sup>3</sup>	361.84	0.61	4.50	0.45	220.72	628.28	162.83	
Total							9740.0	28516.0	24135.0	

San Silverio Pier										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Excavation		m <sup>3</sup>	209.70	1.65	6.98	3.31	346.01	1463.71	694.11	
Concrete	Type-A	m <sup>3</sup>	115.83	13.49	49.85	34.71	1562.55	5774.13	4020.46	
Leveling Concrete	Type-D	m <sup>3</sup>	4.00	5.27	34.35	8.14	21.08	137.40	32.56	
Concrete Mixing		m <sup>3</sup>	115.83	0.84	5.71	0.78	97.30	661.39	90.35	
Concrete Placing		m <sup>3</sup>	115.83	0.75	3.15	1.51	86.87	364.86	174.90	
Reinforcement Bar		Ton	8.11	233.81	127.98	694.18	1896.20	1037.92	5629.80	
Form		m <sup>2</sup>	183.02	0.67	6.23	0.04	122.62	1140.21	7.32	
Staging		Spc·m <sup>3</sup>	206.00	0.61	4.50	0.45	125.66	927.00	92.70	
Total							4258.0	11507.0	10742.0	



San Lorenzo Abutment										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Excavation		m <sup>3</sup>	912.10	1.65	6.98	3.31	1504.80	6365.76	3018.72	
Concrete	Type-A	m <sup>3</sup>	204.58	13.49	49.85	34.71	2759.78	10198.31	7100.97	
Leveling Concrete	Type-D	m <sup>3</sup>	9.35	5.27	34.35	8.14	49.27	321.17	76.11	
Concrete Mixing		m <sup>3</sup>	204.58	0.84	5.71	0.78	171.85	1168.15	159.57	
Concrete Placing		m <sup>3</sup>	204.58	0.75	3.15	1.51	153.44	644.43	308.92	
Reinforcement Bar		Ton	11.25	233.81	127.98	694.18	2630.36	1439.78	7809.53	
Form		m <sup>2</sup>	340.60	0.67	6.23	0.04	228.20	2121.94	13.62	
Staging		Spc·m <sup>3</sup>	281.52	0.61	4.50	0.45	171.73	1266.84	126.68	
Total							7669.0	23526.0	18614.0	

San Lorenzo Pier										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Excavation		m <sup>3</sup>	370.40	1.65	6.98	3.31	611.16	2585.39	1226.02	
Concrete	Type-A	m <sup>3</sup>	205.50	13.49	49.85	34.71	2772.20	10244.18	7132.91	
Leveling Concrete	Type-D	m <sup>3</sup>	4.80	5.27	34.35	8.14	25.30	164.88	39.07	
Concrete Mixing		m <sup>3</sup>	205.50	0.84	5.71	0.78	172.62	1173.41	160.29	
Concrete Placing		m <sup>3</sup>	205.50	0.75	3.15	1.51	154.13	647.33	310.31	
Reinforcement Bar		Ton	14.39	233.81	127.98	694.18	3364.53	1841.63	9989.25	
Form		m <sup>2</sup>	295.57	0.67	6.23	0.04	296.24	301.80	295.61	
Staging		Spc·m <sup>3</sup>	336.60	0.61	4.50	0.45	205.33	1514.70	151.47	
Total							7602.0	18473.0	19305.0	

Espiritu Abutment										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Excavation		m <sup>3</sup>	878.20	1.65	6.98	3.31	1449.03	6129.84	2906.84	
Concrete	Type-A	m <sup>3</sup>	159.52	13.49	49.85	34.71	2151.92	7952.07	5536.94	
Leveling Concrete	Type-D	m <sup>3</sup>	9.35	5.27	34.35	8.14	49.27	321.17	76.11	
Concrete Mixing		m <sup>3</sup>	159.52	0.84	5.71	0.78	134.00	910.86	124.43	
Concrete Placing		m <sup>3</sup>	159.52	0.75	3.15	1.51	119.64	502.49	240.88	
Reinforcement Bar		Ton	8.77	233.81	127.98	694.18	2050.51	1122.38	6087.96	
Form		m <sup>2</sup>	259.88	0.67	6.23	0.04	174.12	1619.05	10.40	
Staging		Spc·m <sup>3</sup>	190.78	0.61	4.50	0.45	116.38	858.51	85.85	
Total							6245.0	19416.0	15069.0	

Espiritu Pier										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Excavation		m <sup>3</sup>	307.40	1.65	6.98	3.31	507.21	2145.65	1017.49	
Concrete	Type-A	m <sup>3</sup>	243.24	13.49	49.85	34.71	3281.31	12125.51	8442.86	
Leveling Concrete	Type-D	m <sup>3</sup>	5.60	5.27	34.35	8.14	29.51	192.36	45.58	
Concrete Mixing		m <sup>3</sup>	243.24	0.84	5.71	0.78	204.32	1388.90	189.73	
Concrete Placing		m <sup>3</sup>	243.24	0.75	3.15	1.51	182.43	766.21	367.29	
Reinforcement Bar		Ton	17.03	233.81	127.98	694.18	3981.78	2179.50	11821.89	
Form		m <sup>2</sup>	327.72	0.67	6.23	0.04	219.57	2041.70	13.11	
Staging		Spc·m <sup>3</sup>	381.10	0.61	4.50	0.45	232.47	1714.95	171.50	
Total							8639.0	22555.0	22069.0	

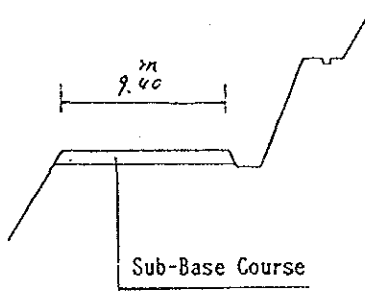
Carasco Abutment										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Excavation		m <sup>3</sup>	1962.70	1.65	6.98	3.31	3238.46	13699.65	6496.54	
Concrete	Type-A <sub>m</sub>	m <sup>3</sup>	370.14	13.49	49.85	34.71	4993.19	18451.48	12847.56	
Leveling Concrete	Type-D	m <sup>3</sup>	15.67	5.27	34.35	8.14	82.58	538.26	127.55	
Concrete Mixing		m <sup>3</sup>	370.14	0.84	5.71	0.78	310.92	2113.50	288.71	
Concrete Placing		m <sup>3</sup>	370.14	0.75	3.15	1.51	277.61	1165.94	558.91	
Reinforcement Bar		Ton	20.36	233.81	127.98	694.18	4760.37	2605.67	14133.50	
Form		m <sup>2</sup>	545.21	0.67	6.23	0.04	365.29	3396.66	21.81	
Staging		Spc·m <sup>3</sup>	540.13	0.61	4.50	0.45	329.48	2430.59	243.06	
Total							14358.0	43862.0	34718.0	

Avaroa Abutment										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Duties	Others		
Excavation		m <sup>3</sup>	219.20	1.65	6.98	3.31	361.68	1530.02	725.55	
Concrete	Type-A	m <sup>3</sup>	62.86	13.49	49.85	34.71	847.98	3133.57	2181.87	
Leveling Concrete	Type-D	m <sup>3</sup>	6.26	5.27	34.35	8.14	32.99	215.03	50.96	
Concrete Mixing		m <sup>3</sup>	62.86	0.84	5.71	0.78	52.80	358.93	49.03	
Concrete Placing		m <sup>3</sup>	62.86	0.75	3.15	1.51	47.15	198.01	94.92	
Reinforcement Bar		Ton	3.46	233.81	127.98	694.18	808.98	442.81	2401.86	
Form		m <sup>2</sup>	155.30	0.67	6.23	0.04	104.05	967.52	6.21	
Staging		Spc·m <sup>3</sup>	161.40	0.61	4.50	0.45	98.45	726.30	72.63	
Total							2354.0	7572.0	5583.0	

Apéndice 6-5 Costo de Mantenimiento

B-201

Gravel Road Maintenance										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Ditoes	Others		
Clearing of Surface		Km	107	299	1,187	635	31,993	127,009	67,945	B-203
Clearing of Structure		Total	1.00	1,070	5,423	1,763	1,070	5,423	1,763	-204
Rehabilitation of Shoulder		Km	107	19	46	54	2,033	4,922	5,778	-05
Patrol		Total	1.00	3,098	10,292	7,298	3,098	10,292	7,298	-206
Sub Total							38,194	147,646	82,784	
Contingency		%	5.00				1,910	7,382	4,139	
Rehabilitaion of Surface	2 Times/Year	Km	107×2 214	406	430	1,375	86,884	92,020	294,250	473,154 207
Total							126,988	247,048	381,173	755,209
Per Km	108.63 <sup>Km</sup>						1,169	2,274	3,509	(6,952)

Condition	Calculation	Remarks
		

Asphalt Road Maintenance										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Ditoes	Others		
Clearing of Surface		Km	107	299	1,187	635	31,993	127,009	67,945	B-203
Clearing of Structure		Total	1.00	1,070	5,423	1,763	1,070	5,423	1,763	-204
Rehabilitation of Shoulder		Km	107	19	46	54	2,033	4,922	5,778	-05
Patrol		Total	1.00	3,098	10,292	7,298	3,098	10,292	7,298	-206
Sub Total							38,194	147,646	82,784	
Contingency		%	5.00				1,910	7,382	4,139	
Rehabilitaion of Surface		Km	107	118.75	123	364.5	12,706	13,161	39,001	209
Total							52,810	168,189	125,924	346,923
Per Km	108.63 <sup>Km</sup>						486	1,548	1,159	(3,193)

Condition	Calculation	Remarks

Asphalt Macadam Road Maintenance										
Name of Work	Size and Type	Unit	Volume	Unit Cost			Cost			Remarks
				L.C.		F.C.	L.C.		F.C.	
				Duties	Others		Ditoes	Others		
Clearing of Surface		Km	107	299	1,187	635	31,993	127,009	67,945	A-203
Clearing of Structure		Total	1.00	1,070	5,423	1,763	1,070	5,423	1,763	-204
Rehabilitation of Shoulder		Km	107	19	46	54	2,033	4,922	5,778	-205
Patrol		Total	1.00	3,098	10,292	7,298	3,098	10,292	7,298	-206
Sub Total							38,194	147,646	82,784	
Contingency		%	5.00				1,910	7,382	4,139	
Rehabilitaion of Surface		Km	107	621	932	1,797	66,447	99,724	192,279	-212
Total							106,551	254,752	279,202	640,505
Per Km	108.63 <sup>Km</sup>						981	2,345	2,570	(5,896)

Condition	Calculation	Remarks
<p>7.0<sup>m</sup></p> <p>Surface Course</p> <p>Binder Course</p> <p>Base Course</p> <p>Sub-Base Course</p>		

Appendix 6-6 Compensation Costs

(Local Currency, Dthers)

Unit : US\$

	Unit	Unit Costo	Section 1		Section 2		Section 3	
			Volumen	Costo	Volumen	Costo	Volumen	Costo
Houses	hou.	1,500	36	54,000	23	34,500	13	19,500
Farm & Orchard	ha	477	3.0	1,431	3.9	1,860	4.6	2,194
Total				55,431		36,360		21,694

	Unit	Unit Costo	Section 4		Section 5		Section 6		Total
			Volumen	Costo	Volumen	Costo	Volumen	Costo	
Houses	hou.	1,500	15	22,500	1	1,500	3	45,000	136,500
Farm & Orchard	ha	477	6.3	3,005	1.1	525	0.3	143	9,158
Total				25,505		2,025		4,643	145,658





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