Table Q. 4 Scoping Results (1)

Bridge SER No.	Environmental Examination Items	Evaluation	Recommendation of Environmental Consideration Items	Necessity for IEE
84	(i)Resettlement, Right of way (Right of common)	○	A－1, A－3, A－5, A－6	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	○	C－1	
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	○	D－2 (Botanical garden)	
1	(i)Resettlement, Right of way (Right of common)	×		◎
	(ii)River-use, Water right	○	B－3	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	○	C－1	
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	○	D－1 (Bronze statue) D－2	
27	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	○	C－1	
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	○	D－2	
75	(i)Resettlement, Right of way (Right of common)	○	A－1, A－2 (Railway), A－3, A－5	◎
	(ii)River-use, Water right	○	B－3	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	○	C－1	
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	○	D－2	
76	(i)Resettlement, Right of way (Right of common)	○	A－1, A－2 (Railway), A－3, A－5	◎
	(ii)River-use, Water right	○	B－3	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	○	C－1	
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	○	D－2	
86	(i)Resettlement, Right of way (Right of common)	×		△
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
87	(i)Resettlement, Right of way (Right of common)	×		△
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		

Table Q. 4 Scoping Results (2)

Bridge SER No.	Environmental Examination Items	Evaluation	Recommendation of Environmental Consideration Items	Necessity for IEE
79	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6	◎
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	○	C－1	
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
80	(i)Resettlement, Right of way (Right of common)	○	A－1, A－3, A－5, A－6	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
43	(i)Resettlement, Right of way (Right of common)	×		◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	○	D－2 (Water-fall)	
44	(i)Resettlement, Right of way (Right of common)	×		△
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
45	(i)Resettlement, Right of way (Right of common)	×		◎
	(ii)River-use, Water right	○	B－1 (Irrigation)	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
89	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6	◎
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
91	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		

Table Q. 4 Scoping Results (3)

Bridge SER No.	Environmental Examination Items	Evaluation	Recommendation of Environmental Consideration Items	Necessity for IEE
178	(i)Resettlement, Right of way (Right of common)	×		◎
	(ii)River-use, Water right	○	B－1 (Irrigation)	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
93	(i)Resettlement, Right of way (Right of common)	○	A－2, A－3, A－5	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	○	C－1	
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	○	D－2	
46	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6	◎
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
47	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6, A－7	◎
	(ii)River-use, Water right	○	B－1, B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
99	(i)Resettlement, Right of way (Right of common)	○	A－1, A－2 (Temple, School) A－3, A－5	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	○	C－1, C－2	
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	○	D－2	
2	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
36	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		

Table Q. 4 Scoping Results (4)

Bridge SER No.	Environmental Examination Items	Evaluation	Recommendation of Environmental Consideration Items	Necessity for IEE
102	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
65	(i)Resettlement, Right of way (Right of common)	×		◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
103	(i)Resettlement, Right of way (Right of common)	×		◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
52	(i)Resettlement, Right of way (Right of common)	○	A－1, A－3, A－5, A－6, A－7	◎
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
106	(i)Resettlement, Right of way (Right of common)	○	A－1, A－3, A－5, A－6	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
108	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－7	◎
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
119	(i)Resettlement, Right of way (Right of common)	○	A－1, A－2 (Temple), A－3, A－5	◎
	(ii)River-use, Water right	○	B－1 (Agricaltural), B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		

Table Q: 4 Scoping Results (5)

Bridge SER No.	Environmental Examination Items	Evaluation	Recommendation of Environmental Consideration Items	Necessity for IEE
175	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5	◎
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
120	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6, A－7	◎
	(ii)River-use, Water right	○	B－1	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
30	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－7	◎
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
122	(i)Resettlement, Right of way (Right of common)	×		△
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
123	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
55	(i)Resettlement, Right of way (Right of common)	○	A－1, A－3, A－5, A－6	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
56	(i)Resettlement, Right of way (Right of common)	○	A－1, A－3, A－5	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		

Table Q. 4 Scoping Results (6)

Bridge SER No.	Environmental Examination Items	Evaluation	Recommendation of Environmental Consideration Items	Necessity for IEE
127	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6	◎
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
128	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6	◎
	(ii)River-use, Water right	○	B－1 (Agricultural)	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
66	(i)Resettlement, Right of way (Right of common)	○	A－1, A－3, A－5, A－6	◎
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	○	C－1	
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
31	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－7	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
57	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－7	◎
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
129	(i)Resettlement, Right of way (Right of common)	○	A－1, A－3, A－5	◎
	(ii)River-use, Water right	○	B－1, B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
130	(i)Resettlement, Right of way (Right of common)	×		◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		

Table Q. 4 Scoping Results (7)

Bridge SER No.	Environmental Examination Items	Evaluation	Recommendation of Environmental Consideration Items	Necessity for IEE
131	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－7	◎
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
209	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－7	◎
	(ii)River-use, Water right	○	B－1 (Agricultural)	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
210	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5	◎
	(ii)River-use, Water right	○	B－1 (Agricultural)	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
58	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－7	◎
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
67	(i)Resettlement, Right of way (Right of common)	○	A－1, A－3, A－4, A－5, A－6	◎
	(ii)River-use, Water right	○	B－1 (Irrigation), B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
18	(i)Resettlement, Right of way (Right of common)	○	A－1, A－3, A－5	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
68	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		

Table Q. 4 Scoping Results (8)

Bridge SER No.	Environmental Examination Items	Evaluation	Recommendation of Environmental Consideration Items	Necessity for IEE
208	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6	◎
	(ii)River-use, Water right	○	B－1 (Irrigation)	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
69	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5	◎
	(ii)River-use, Water right	○	B－1 (Agricultural)	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
133	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－7	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
78	(i)Resettlement, Right of way (Right of common)	○	A－1, A－3, A－5, A－6, A－7	◎
	(ii)River-use, Water right	○	B－1 (Water supply), B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
19	(i)Resettlement, Right of way (Right of common)	×		△
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
71	(i)Resettlement, Right of way (Right of common)	×		◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
72	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6	◎
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		

Table Q. 4 Scoping Results (9)

Bridge SER No.	Environmental Examination Items	Evaluation	Recommendation of Environmental Consideration Items	Necessity for IEE
135	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5	◎
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
34	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
38	(i)Resettlement, Right of way (Right of common)	○	A－2 (Bo-tree), A－3, A－5, A－6	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
136	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6	◎
	(ii)River-use, Water right	○	B－1 (Agricultural)	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
195	(i)Resettlement, Right of way (Right of common)	○	A－2 (Temple), A－3, A－4, A－5, A－6, A－7	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	○	C－1	
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
197	(i)Resettlement, Right of way (Right of common)	○	A－2, A－3, A－4, A－5, A－6, A－7	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	○	C－1	
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
201	(i)Resettlement, Right of way (Right of common)	○	A－2, A－3, A－4, A－5, A－6, A－7	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	○	C－1	
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		

Table Q. 4 Scoping Results (10)

Bridge SER No.	Environmental Examination Items	Evaluation	Recommendation of Environmental Consideration Items	Necessity for IEE
60	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6	◎
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
138	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6	◎
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
173	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5	◎
	(ii)River-use, Water right	○	B－1 (Irrigation)	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
202	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
139	(i)Resettlement, Right of way (Right of common)	×		△
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
39	(i)Resettlement, Right of way (Right of common)	×		△
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
61	(i)Resettlement, Right of way (Right of common)	×		◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		

Table Q. 4 Scoping Results (11)

Bridge SER No.	Environmental Examination Items	Evaluation	Recommendation of Environmental Consideration Items	Necessity for IEE
144	(i)Resettlement, Right of way (Right of common)	×		△
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
147	(i)Resettlement, Right of way (Right of common)	×		△
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
148	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6, A－7	◎
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
21	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
40	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－7	◎
	(ii)River-use, Water right	○	B－1 (Agricultural)	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
62	(i)Resettlement, Right of way (Right of common)	×		◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
63	(i)Resettlement, Right of way (Right of common)	×		△
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		

Table Q. 4 Scoping Results (12)

Bridge SER No.	Environmental Examination Items	Evaluation	Recommendation of Environmental Consideration Items	Necessity for IEE
73	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
22	(i)Resettlement, Right of way (Right of common)	○	A－1, A－3, A－5	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
17	(i)Resettlement, Right of way (Right of common)	○	A－1, A－3, A－5	◎
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
32	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6	◎
	(ii)River-use, Water right	○	B－1	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
150	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5	◎
	(ii)River-use, Water right	○	B－1 (Agricultural), B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
151	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－7	◎
	(ii)River-use, Water right	○	B－1 (Agricultural), B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
154	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－7	◎
	(ii)River-use, Water right	○	B－1 (Agricultural), B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		

Table Q. 4 Scoping Results (13)

Bridge SER No.	Environmental Examination Items	Evaluation	Recommendation of Environmental Consideration Items	Necessity for IEE
24	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5	◎
	(ii)River-use, Water right	○	B－1 (Agricultural)	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
25	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
35	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
41	(i)Resettlement, Right of way (Right of common)	×		△
	(ii)River-use, Water right	×		
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
26	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
42	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－6	◎
	(ii)River-use, Water right	○	B－2	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		
74	(i)Resettlement, Right of way (Right of common)	○	A－3, A－5, A－7 Paddy	◎
	(ii)River-use, Water right	○	B－1 (Agricultural)	
	(iii)Traffic Obstruction (Vehicles and Pedestrians)	×		
	(iv)Others (Remains and cultural assets, Landscape/Scenary)	×		

Legends

○ : Selected as an environmental item ／ Proposed as an item for environmental consideration.

× : Not selected as an environmental item ／ Not proposed as an item for environmental consideration.

◎ : IEE is considered to be necessary.

△ : IEE is not considered to be necessary.

Appendix - R

DATA OF COST ESTIMATE FOR MAINTENANCE AND MANAGEMENT

LIST OF CONTENTS

Appendix-R Data of cost estimate for maintenance and management

The cost estimate was made in accordance with the following proposals.

1. Proposal

To establish new Maintenance Center in Engineering Services Division, in RDA Head Office and Maintenance Section at each Provincial Office.

1.1 Personnel

	Maintenance Center at Head Office	Maintenance Section at each Provisional Office
Chief Engineer	1	0
Engineer	2	9
Technical Officer	3	9
Draftsman	1	0
Clerk	1	0
Record Keeper	1	0
Operator	1	0
Total	10	18

1.2 Plant, Equipment & Tool

Bridge Inspection Vehicle	1	0
Ultrasonic Steel Thickness Meter	1	0
Ultrasonic Hardness Meter	1	0
Schmidt Hammer	2	0
Sedan and Van	2	
Total	7	0

1.3 Materials

Necessary materials, such as epoxy resin, coal tar epoxy or coal tar paint.

1.4 Duties of new maintenance center and maintenance section

(1) Bridge Maintenance Management (Inspection, Maintenance, Rehabilitation)

Details are as follows.

1) Inspection

* Preliminary Inspection (Visual Inspection) for and preparation of Bridge Inventory and Inspection Forms	4,430 bridges
* Detailed Inspection More careful inspection on specific bridge members	As required

* Detailed survey Approx.440 bridges

2) Maintenance

Maintenance with minor repairs.

3) Rehabilitation

Major repair, strengthening and functional improvement

2. Cost Estimate

2.1 Inspection

(1) Personnel (Cost per year)

* Maintenance Center at RDA Head Office

	No.	Rs/Mo		Rs.
Chief engineer	1	x25,000	x 12 =	300,000
Engineer	2	x20,000	x 12 =	480,000
Technical office	3	x15,000	x 12 =	540,000
Draftsman	1	x 8,000	x 12 =	96,000
Clerk	1	x 7,000	x 12 =	84,000
Operator	1	x12,000	x 12 =	144,000
Record keeper	1	x 8,000	x 12 =	96,000
Sub total				1,740,000

with others Rs. 2.0 mill./year

Maintenance Section at 9 Provisional Offices

	No.	Rs/Mo		Rs.
Engineer	9	x20,000	x 12 =	2,160,000
Technical office	9	x15,000	x 12 =	1,620,000
Sub total				3,780,000

With others the total is Rs.4.0 mill./year

(2) Plant Equipment and Tools

* At Maintenance Center

- Bridge inspection vehicle Brand new Rs. 12 million

  Transporft. Rs. 1 million

  (12+1) / 15years x (repair and operation 1.3) = Rs. 1.2 million

- Ultrasonic Steel Thickness & Hardness Meters and Schmidt Hammer

Rs. 0.3 million

- Vehicles, van and sedan Rs. 175, 000 x12 = Rs. 2.1 million

The total is Rs. 1.2 + 0.3 + 2.1 = Rs. 3.6 million

(3) Office Space (with running cost) for maintenance Center

- Office space with running cost

10 ^2 m2 x Rs.490.05 m2 x 12 months = Rs.0.6 million

- Furnitures

		In Rs.
Execution Desk	1 x 12,000	= 12,000
Desk	7 x 6,500	= 45,500
Arm Chair	8 x 1,500	= 12,000
Steel Cabinet	5 x 7,500	= 37,500
File Cabinet	7 x 7,000	= 49,000
Drafting Table	2 x 50,000	=100,000
Drafting Chair	2 x 1,500	= 3,000
Sub Total		259,000

The annual cost will be 259,000 x 1/15 x 1.3 =Rs. 0.3 million

The total with others will be (0.6 + 0.3) x 1.3 = Rs. 1.2 million

(4) Total Cost

Total cost is shown in Table R.1.

Table R.1 Total Cost of Bridge Maintenance and Management per year for inspection (Unit: Rs.million)

	Maintenance Center	Maintenance Section	Total
Personnel	2.0	4.0	6.0
Plant,equip.Tool	3.6	1.0	4.6
Office etc.	1.2	0.6	1.8
Contingency	0.4	0.6	1.0
Total	7.2	6.2	13.4

Notes 1. Depreciation of plant, equipment and tool shall be estimated for the duration of 15 years.
2. Repair fee is estimated by 20%.

The inspedtion cost would be about Rs. 13.4 million per year.

2.2 Maintenance

The annual cost of works of maintenance with minor repairs will be Rs 1.5 million being shown in the following.

Table R.2 Routine Maintenance with Minor Repairing

(Rs. per year)

1. Personnel			
	Tech. officer	1 x 15000/4 =3,750	
	Skilled labourer	1 x 8000/4 = 2,000	
	labourers	2 x 6000 /4 = 3,000	
	Total	8,750	
2. Material		14,000	Paint, brush,etc.
3. Facilities		2,000	
Total		Rs. 24,750	

The bridge length of average 62m per bridge was used.

The above total can be rounded at Rs 25,000, meaning the four persons will complete the maintenance and repair work on a bridge in a week. If 20 % of the whole bridge is inspected and maintained in 15 years, the cost per year will be as under;

4,430 bridges x 0.20 x 1/15 x 25000 = Rs. 1476,000 = Rs. 1.5 million

2.3 The Total Cost

The total cost of inspection and maintenance is estimated at Rs. 13.4 million + 1.5 million = Rs. 14.9 million.

Appendix - S

DATA OF COST ESTIMATE

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1. Unit Rate for Labour, Material and Equipment

Labour Unit Rate

Code	Description	Unit	Rate	Remark
1	Foreman	man/day	250.00	
2	Skilled labour A	man/day	207.00	
3	Skilled labour B	man/day	161.00	
4	Semi skilled	man/day	137.00	
5	Unskilled	man/day	123.00	

Hire Charges

Code	Description	Unit	Rate	Remark
101	Tar boiler	day	63.00	
102	Concrete and asphalt mixer (400 ltrs)	day	1,008.00	
103	Bitumen sprayer	day	63.00	
104	Water tank + 50mm. pump	day	252.00	
105	Welding plant with generator	day	1,260.00	
106	Porker vibrator	day	252.00	
107	Plate vibrator (90kg)	day	756.00	
108	Vibrating hammer (60kg)	day	403.00	
109	Vibrating roller (1/2 - 1 ton)	day	1,462.00	
110	Vibrating roller (smooth - 10 tons)	day	6,048.00	
111	Road roller (8 - 10 tons)	day	1,764.00	
112	Pneumatic road roller (7 - 12 tons)	day	5,040.00	
113	Motor grader (65hp)	day	4,536.00	
114	Motor grader (120 - 140 hp)	day	8,064.00	
115	Backhoe loader (.75cu.m)	day	4,620.00	
116	Wheel loader (1.7cu.m)	day	6,468.00	
117	Tractor & Trailer	day	800.00	
118	Dump truck / tipper	km/cu.m	5.25	
119	Dump truck / tipper	km/cu.m	5.90	
120	Transport of premix by dump truck	km/m.ton	3.15	
121	Sand / chip spreader - self propelled	day	4,032.00	
122	Farm tractor & broom	day	3,528.00	
123	Bitumen distributor (4000 ltrs)	day	6,048.00	
124	Wheel loader (2.7 - 3.1 cu.m)	day	10,500.00	
125	Lorry / tipper 3 ton (2.0cu.m)	km	8.20	
126	Lorry / tipper 5 ton (2.0cu.m)	km	10.50	
127	Lorry / tipper 7 ton (2.0cu.m)	km	14.20	
128	Water browser (4,000 ltrs)	day	1,575.00	
129	Asphalt raver (6m)	hour	1,522.50	
130	Tanker (20,000 ltrs) only	hour	1,323.00	
131	Prime mover	hour	1,827.00	
132	Baby dumper	hour	89.25	

133	Water pump 4"	hour	89.25	
134	Sludge pump 2"	hour	99.75	
135	Vibrating roller (smooth 7tons) tandem	hour	567.00	
136	Concrete mixer (weigh batch type) 400/300l	day	2,600.00	
137	Mobile crane 25ton	hour	1,522.50	
138	Low bed trailer 20ton	km	63.00	
139	Low bed trailer 30ton	km	94.50	
140	Low bed trailer 50ton	km	105.00	
141	Lorry / tipper 10ton	km	22.68	
142	Mobile crane (travelling)	km	36.75	
143	Air compressors 125cfm	hour	210.00	
144	Air compressors 250cfm	hour	504.00	
145	Air compressors 300cfm	hour	987.00	
146	Air compressors 600cfm	hour	1,176.00	
147	Track drill with compressor 750cfm	hour	1,638.00	
148	Crane and drop hammer for piling	hour	2,625.00	
149	Transport for crane & pile driving equipment	km	231.00	
150	Vibro hammer with generator	hour	1,496.25	
151	Transport for vibro hammer & generator	km	115.50	
152	Drawler crane	hour	1,601.25	

Material Unit Rate

Code	Description	Unit	Rate	Remark
201	(50mm) Aggregate	cu.m	555.52	
202	(37.5mm) Aggregate	cu.m	622.34	
203	(25mm) Aggregate	cu.m	733.32	
204	(19mm) Aggregate	cu.m	978.74	
205	Crusher fine (6.3mm downwards)	cu.m	255.80	
206	river sand for concrete & masonry work	cu.m	300.00	
207	Common burnt clay building bricks	1000 no.	1,600.00	
208	Asphalt con. surfacing material - dense (19mm)	m.ton	1,630.95	
209	Asphalt con. bound base material - dense (19mm)	m.ton	1,262.35	
210	Asphalt con. dense (cold mix with cut back) (19mm)	m.ton	1,455.00	
211	Sawn timber class 1 (local)	cu.deci	21.05	
212	Sawn timber class 2 (local)	cu.deci	16.45	
213	Firewood	cu.m	446.50	
214	Portland cement	bags	267.20	
215	Mild steel	kg	32.15	
216	Binding wire	kg	48.30	
217	Paint - anti corrosive	ltr	155.55	
218	Paint - reflective	ltr	1,156.50	
219	Paint - emulsion	ltr	181.80	
220	Emulsion for exterior use (wethersheild)	ltr	234.55	

221	Lubricant	ltr	48.00	
222	Diesel (Colombo)	ltr	12.00	
223	Petrol (Colombo)	ltr	35.00	
224	Barricading (small work items)	item	18.30	
225	Barricading, lighting, signalling etc for 100m	day	318.50	
226	Sand paper & cott. waste (per 9.29sq.m)	item	52.00	
227	53' - 0" long P.S.C. beam	nos.	38,161.50	
228	53' - 0" long P.S.C. beam for 62' - 6" beam	nos.	36,957.38	
229	44' - 0" long P.S.C. beam	nos.	25,650.95	
230	40' - 0" long P.S.C. beam	nos.	23,322.98	
231	35' - 0" long P.S.C. beam	nos.	17,763.01	
232	23' - 0" long P.S.C. beam	nos.	15,519.01	
233	27' - 0" long P.S.C. beam	nos.	13,500.00	
234	23' - 0" long P.S.C. beam	nos.	13,233.03	
235	20' - 0" long P.S.C. beam	nos.	11,738.68	
236	17' - 0" long P.S.C. beam	nos.	8,121.36	
237	14' - 0" long P.S.C. beam	nos.	6,493.63	
238	11' - 0" long P.S.C. beam	nos.	5,067.21	
239	Handrails	nos.	494.00	
240	Uprights for handrails	nos.	434.72	
241	Fascia slabs 914mm x 1219mm	nos.	597.74	
242	Fascia slabs 609mm x 1219mm	nos.	434.72	
243	Rainwater channels 610mm long	nos.	113.62	
244	Kerbs 915mm long	nos.	360.62	
245	Kerbs 1000mm long for roads	nos.	203.78	
246	Paving slabs 450mm x 450mm x 50mm	nos.	108.68	
247	Paving slabs 450mm x 450mm x 50mm (reinforced)	nos.	163.02	
248	R.C.C. piles 355mm x 355mm x 9144mm	nos.	22,628.91	
249	R.C.C. piles 355mm x 355mm x 10667mm	nos.	26,400.60	
250	R.C.C. sheet piles 304mm x 203mm x 6096mm	nos.	9,426.76	
251	Weepholes 457mm long	nos.	129.68	
252	Rails (used)	L.m	656.17	
253	50mm x 50mm x 6mm angle iron	kg	34.00	
254	12mm thick mild steel plates	sq.m	2,859.16	
255	75mm x 12mm rubber bearing pad	m	410.00	
256	610mm x 610mm x 12mm rubber sheet	sq.m	625.00	
257	160mm dia. P.V.C. pipes (type 250)	m	262.70	
258	110mm dia. P.V.C. pipes (type 250)	m	119.20	
259	50mm dia. P.V.C. pipes (type 400)	m	48.45	
260	25mm dia. P.V.C. pipes (type 1000)	m	26.00	
261	325mm dia. Polythene tubes	m	10.00	
262	150mm dia. Polythene tubes	m	5.00	
263	Primer for patching	sq.m	1,350.00	
264	Resin mortar	cu.cm	3.83	
265	Mat gabion	nos.	35,093.00	

266	Epoxy resin for crack injection	cu.cm	30.34	
267	Steel plate	ton	31,000.00	
268	Main beam	ton	31,000.00	

2. Work Item Rate

Work Item Rate

Code	Description	Unit	Rate	Remark
301	Class A cement concrete grade 50 (20) mixed and laid distance up to 30m. (including transport of aggregate up to 16km)	cu.m	5,920.00	
302	Class A cement concrete grade 45 (20) mixed and laid distance up to 30m. (including transport of aggregate up to 16km)	cu.m	5,712.00	
303	Class A cement concrete grade 40 (20) mixed and laid distance up to 30m. (including transport of aggregate up to 16km)	cu.m	5,510.00	
304	Class A cement concrete grade 30 (20) mixed and laid distance up to 30m. (including transport of aggregate up to 16km)	cu.m	5,319.00	
305	Class A cement concrete grade 25 (20) mixed and laid distance up to 30m. (including transport of aggregate up to 16km)	cu.m	5,054.00	
306	Class A cement concrete grade 25 (70% 40 + 30% 20) mixed and laid distance up to 30m. (including transport of aggregate up to 16km)	cu.m	4,826.00	
307	Class A cement concrete grade 20 (20) mixed and laid distance up to 30m. (including transport of aggregate up to 16km)	cu.m	4,708.00	
308	Class A cement concrete grade 20 (40) mixed and laid distance up to 30m. (including transport of aggregate up to 16km)	cu.m	4,294.00	
309	Class B cement concrete grade 20 (14) mixed and laid distance up to 30m. (including transport of aggregate up to 16km)	cu.m	3,693.00	

310	Class B cement concrete nominal mix 1:2:4 (20) mixed and laid distance up to 30m. (including transport of aggregate up to 16km)	cu.m	4,053.00	
311	Class B cement concrete nominal mix 1:2:4 (40) mixed and laid distance up to 30m (including transport of aggregate up to 16km)	cu.m	3,656.00	
312	Class C cement concrete nominal mix 1:3:6 (20) mixed and laid distance up to 30m. (including transport of aggregate up to 16km)	cu.m	3,565.00	
313	Class B cement concrete nominal mix 1:3:6 (40) mixed and laid distance up to 30m. (including transport of aggregate up to 16kg)	cu.m	3,124.00	
314	Rendering 12.5mm thick in cement sand mortar 1:2 mix rough finish	sq.m	116.50	
315	Rendering 12.5mm thick in cement sand mortar 1:2 mix smooth finish	sq.m	139.25	
316	Rendering 19mm thick in cement sand mortar 1:2 mix rough finish	sq.m	167.50	
317	Rendering 19mm thick in cement mortar 1:2 mix smooth finish	sq.m	190.25	
318	Lifting concrete or rubble for every 1.5m beyond initial 1.5m	cu.m	122.75	
319	Lowering concrete or rubble for every 1.5m beyond initial 1.5m	cu.m	61.40	
320	Transport of concrete. metal or rubble beyond 30m up to 100m	cu.m	61.40	
321	Transport of concrete. metal or rubble beyond 100m up to 200m	cu.m	153.50	
322	Curing of concrete decks & slabs by watering twice a day for 7 days and once a day for subsequent 7 days	cu.m	364.25	
323	Curing substructure concrete by watering twice a day for 7 days	cu.m	16.60	
324	Dewatering for concreting in excavated pit	cu.m	232.00	
325	Transport of material by dump truck/tipper excluding loading for distance less than or equal to 3km. (fixed rate up to 3km)	cu.m	24.40	
326	Transport of material by dump truck/tipper excluding loading for distance less than or equal to 10km. (rate for 1 cu.m per 1km distance)	km/cu.m	8.15	

327	Transport of material by dump truck/tipper excluding loading for distance more than 10km (rate for 1 cu.m per 1km distance)	km/cu.m	7.25	
328	Formwork smooth finish with class II timber inclusive of planks, joints, bearers props, etc. and dismantling (for 3 uses)	sq.m	772.00	
329	Formwork rough finish with class II timber inclusive of planks, joints, bearers props in foundation including removing (for 3 uses)	sq.m	698.00	
330	Hot rolled mild steel reinforcement supplying, cutting, bending, tying and fixing in position (including transport of steel)	kg	61.75	
331	Cold worked deformed high yield steel reinforcement supplying, cutting, bending, tying and fixing in position (including transport of steel)	kg	66.25	
332	Dewatering for laying and fixing steel reinforcement in excavated fit	kg	10.70	
333	Excavation and backfill for foundation in ordinary soil not exceeding 1.5m depth (including loading, unloading and transporting with in 25m)	cu.m backfilling (35%)	217.50	
334	Excavation and backfill for foundation in medium soil not exceeding 1.5m depth (including loading, unloading and transporting with in 25m)	cu.m backfilling (35%)	254.25	
335	Excavation and backfill for foundation in hard soil not exceeding 1.5m depth (including loading, unloading and transporting with in 25m)	cu.m backfilling (35%)	328.00	
336	Excavation and backfill for foundation in ordinary soil exceeding 1.5m and not exceeding 3.0m depth (including loading, unloading and transporting with in 25m)	cu.m backfilling (35%)	291.00	
337	Excavation and backfill for foundation in medium soil exceeding 1.5m and not exceeding 3.0m depth (including loading, unloading and transporting with in 25m)	cu.m backfilling (35%)	328.00	
338	Excavation and backfill for foundation in hard soil exceeding 1.5m and not exceeding 3.0m depth (including loading, unloading and transporting with in 25m)	cu.m backfilling (35%)	401.50	

339	Approved soil spread and compacted in places behind abutments and structures, shoulders and in service line trenches, using machine rammer including watering (rate for compacted volume)	cu.m of loose volume cu.m of compacted volume (95%)	167.50	
340	Excavation in soft rock not exceeding 1.5m (including loading, unloading and transporting with in 25m)	cu.m	255.50	
341	Excavation in soft rock exceeding 1.5m and not exceeding 3.0m depth (including loading, unloading and transporting with in 25m)	cu.m	316.50	
342	Lifting soil for every 1.5m beyond initial 1.5m	cu.m	61.40	
343	Casting and supplying of 355m x 355m RCC piles of 9,144m long (excluding transport of piles to the site)	L.m	3,530.00	
344	Transport of 355m x 355m x 9144m piles to the site (rate per 1 L.m/km distance)	L.m/km	3.60	
345	Casting and supplying of 305mm x 200mm R.C. sheet piles of 6.10m long (excluding transport of pile to the site)	L.m	2,214.00	
346	Transport of 305mm x 200mm x 6100mm sheet piles to the site (rate per 1 L.m/km distance)	L.m/km	1.20	
347	Driving 355mm x 355mm x 9.15m R.C.C. piles inclusive of piling equipment to the site and erection, shifting and dismantling same (including 100km travelling distance for piling equipment and cranes)	L.m	2,259.00	
348	Driving 305mm x 200mm x 6.10mm R.C.C. sheet piles using hard monkey	L.m	691.00	
349	Supplying and fixing precast weepholes in abutments and wingwalls with opening not less than 7500sq.mm and finished smooth (including transport of weepholes)	L.m	512.50	
350	Supplying and fixing 110mm diameter P.V.C. pipes in weepholes in abutments and wingwalls	per 1	224.50	
351	Forming weepholes in abutments and wingwalls	L.m	43.90	
352	50 - 200mm dry stone lining behind abutments and wingwalls (including transport of aggregate up to 16km)	cu.m	769.00	

353	75mm thick 40mm stone filter layer behind dry stone lining (including transport of aggregate up to 16km)	cu.m	990.00	
354	Clay puddled and laid behind abutments and wingwalls (including cost of clay and transport of clay up to 16km)	cu.m	496.50	
355	Supplying and fixing mild steel dowels, spliced and dove tailed with wedge at one end, 25mm diameter and 0.2m long, boring holes to 0.1m depth in fixing (approach slabs)	nos.	97.00	
356	Supplying and fixing mild steel dowels, spliced and dove tailed with wedge at one end, 20mm diameter and 1.8m long, boring holes to 0.9m depth in fixing	nos.	358.50	
357	Supplying and fixing mild steel dowels, spliced and dove tailed with wedge at one end, 20mm diameter and 0.76m long, boring holes to 0.38m depth in fixing	nos.	175.50	
358	Supplying and fixing mild steel dowels, spliced and dove tailed with wedge at one end, 20mm diameter and 0.90m long, boring holes to 0.45m depth in fixing	nos.	200.75	
359	Supplying and fixing mild steel dowels, spliced and dove tailed with wedge at one end, 16mm diameter and 0.76m long, boring holes to 0.38m depth in fixing	nos.	130.25	
360	Casting, supplying and stacking type P.S.C. beam 16.23m (53'0") long (excluding transport of beam to site)	nos.	54,819.00	
361	Transport of 16.23m long P.S.C. beam to the site (rate nos./km distance)	nos./km	65.10	
362	Casting, supplying and stacking type P.S.C. beam 13.48m (44'0") long (excluding transport of beam to site)	nos.	36,893.00	
363	Transport of 13.48m long P.S.C. beam to the site (rate nos./km distance)	nos./km	43.40	
364	Casting, supplying and stacking type P.S.C. beam 12.27m (40'0") long (excluding transport of beam to site)	nos.	33,687.00	
365	Transport of 12.27m long P.S.C. beam to the site (rate nos./km distance)	nos./km	43.40	
366	Casting, supplying and stacking type P.S.C. beam 10.74m (35'0") long (excluding transport of beam to site)	nos.	25,639.00	

367	Transport of 10.74m long P.S.C. beam to the site (rate nos./km distance)	nos./km	32.60	
368	Casting, supplying and stacking type P.S.C. beam 9.83m (32'0") long (excluding transport of beam to site)	nos.	22,549.00	
369	Transport of 9.83m long P.S.C. beam to the site (rate nos./km distance)	nos./km	32.60	
370	Casting, supplying and stacking type P.S.C. beam 8.23m (27'0") long (excluding transport of beam to site)	nos.	19,768.00	
371	Transport of 8.23m long P.S.C. beam to the site (rate nos./km distance)	nos./km	32.60	
372	Casting, supplying and stacking type P.S.C. beam 7.09m (23'0") long (excluding transport of beam to site)	nos.	19.008.00	
373	Transport of 7.09m long P.S.C. beam to the site (rate nos./km distance)	nos./km	21.70	
374	Internal transporting, launching and centering type P.S.C. beam 16,154m long on bearing pads (including 100km travelling distance to mobile crane)	nos.	3,882.00	
375	Internal transporting, launching and centering type P.S.C. beam 13,411m & 12,192m long on bearing pads (including 100km travelling distance to mobile crane)	nos.	3,122.00	
376	Internal transporting, launching and centering type P.S.C. beam 10,668m, 9,754m & 8,230m long on bearing pads (including 100km travelling distance to mobile crane)	nos.	2,230.00	
377	Internal transporting, launching and centering type P.S.C. beam 7,010m, 5,182m, 4,267m & 3,353m long on bearing pads (including 100km travelling distance to mobile crane)	nos.	1,785.00	
378	Supplying, fixing and painting precast handrails and uprights (excluding transport of precast products)	L.m	1,888.00	
379	Transport of precast handrails and uprights to the site (rate nos./km distance)	L.m/km	1.00	
380	Casting, smoothing and painting end pillasters in concrete of grade 25 (20) with foundation type I (pile foundation using 5m long rails) including 100km travelling distance for materials and machinery	nos.	57,589.00	

381	Casting, smoothing and painting end pillasters in concrete of grade 25 (20) with foundation type I (pile foundation using 3m long rails) including 100km travelling distance for materials and machinery	nos.	45,018.00	
382	Casting, smoothing and painting end pillasters in concrete of grade 25 (20) with foundation type II	nos.	16,861.00	
383	Casting, smoothing and painting end pillasters in concrete of grade 25 (20) with foundation type III	nos.	18,205.00	
384	Casting, smoothing and painting end pillasters in concrete of grade 25 (20) with foundation type IV	nos.	10,952.00	
385	Supplying and fixing precast kerbs using 1:2 cement mortar and painting (excluding transport of kerbs to the site)	L.m	696.00	
386	Transport of precast kerbs to the site (rate L.m/km distance)	L.m/km	0.70	
387	150mm wide 50mm thick lower kerb in grade 20 (14) concrete at the edge of the carriageway and finish smooth inclusive of shaping surface at rain water outlets	L.m	119.00	
388	25mm expansion joint supplied and fixed to deck inclusive of all incidental work required	L.m	1,780.00	
389	75mm x 12mm hard rubber bearing pads supplied and laid over capping beam	L.m	582.50	
390	20mm dia. stainless steel dowels supplied, fixed and grouted at fixed ends of deck	nos.	217.25	
391	20mm dia. jumper steel dowels supplied, fixed and grouted at fixed ends of deck	nos.	160.50	
392	bituminous sealing felt supplied and laid under beams	L.m	42.80	
393	325mm dia. Polythene displacers supplied and filled with saw dust or similar light material (including transport of saw dust up to 16km)	L.m	49.10	
394	150mm dia. Polythene displacers supplied and filled with saw dust or similar light material (including transport of saw dust up to 16km)	L.m	16.40	
395	Forming service duct in deck (rate m length / m height of duct)	sq.m	1,544.00	

396	50mm thick cover slabs for service ducts in grade 25 (20) concrete inclusive of light reinforcement (rate sq.m slab)	sq.m	1,121.50	
397	160mm dia. P.V.C. service duct supplying fixing in deck	L.m	385.25	
398	110mm dia. P.V.C. rain water outlets supplied and fixed through deck	L.m	213.00	
399	50mm dia. P.V.C. drain pipes supplied and fixed through deck	L.m	98.50	
400	25mm dia. P.V.C. drain pipes supplied and fixed through deck	L.m	58.90	
401	Tack coat using emulsion (CSS-1) at the rate of 0.45 ltrs/sq.m inclusive of brushing, cleaning concrete deck surface and cost of emulsion	sq.m	10.85	
402	Supply, lay and compact asphalt concrete cold mix using (10-20%) cut back bitumen and dense graded coarse aggregate of nominal size 20mm (exclusive of transport of asphalt concrete and inclusive of 2 days travelling time to road roller)	m.t	2,844.50	
403	Transport of asphalt concrete to the site (rate m.t/km distance)	km/m.ton	4.35	
404	Supplying and fixing precast concrete rainwater channels	nos.	385.50	
405	Bailey Bridge	sq.m.day	44.00	
406	Cement grouting	cu.m	3,565.00	
407	Demolish of existing deck	sq.m	2,887.00	
408	Main beam	ton	92,569.00	
409	Deck slab	sq.m	4,685.00	
410	Accessory	sq.m	2,746.00	
411	Widening of deck slab	sq.m	12,142.00	
412	Repaint	sq.m	1,120.00	
413	Patching for steel member	kg	100.00	

3. Unit Price

Derivation of Unit Price

Work Item : Concrete for abutment

Data for : Concrete 1.0 m3

	Description of Item	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
	Concrete	1.0	m3	5,054.00	5,054
	Formwork	2.0	m2	772.00	1,544
	Reinforcement	0.03	t	66,250.00	1,988
	Drainage Backfill Material	0.3	m3	1,000.00	300
	Miscellaneous(3% of above)	1.0	LS	-	267
	Indirect cost from preliminaries and management etc. (25% of abov	1.0	LS	-	2,288
	Total				11,440
	Rate per 1 m3				11,440
	Say				11,400

Work Item : Concrete for pier

Data for : Concrete 1.0 m3

	Description of Item	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
	Concrete	1.0	m3	5,054.00	5,054
	Formwork	2.0	m2	772.00	1,544
	Reinforcement	0.03	t	66,250.00	1,988
	Miscellaneous(3% of above)	1.0	LS	-	258
	Indirect cost from preliminaries and management etc. (25% of abov	1.0	LS	-	2,211
	Total				11,054
	Rate per 1 m3				11,054
	Say				11,100

Work Item : Excavation Open

Data for : Excavation B=4.0m, L=10.0m, h=3.5m, i=0.5 306.0 m3

	Description of Item	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
	Excavation (H≦1.5, Ordinal soil)	160.70	m3	217.50	34,952
	Excavation (1.5<H≦3.0, Ordinal soil)	115.70	m3	291.00	33,669
	Excavation (3.0<H≦4.5, Hard soil)	29.60	m3	316.50	9,368
	Preparation of Base	42.84	m3	500.00	21,420
	Dewatering	306.00	m3	232.00	70,992
	Miscellaneous(3% of above)	1.0	LS	-	5,112
	Indirect cost from preliminaries and management etc. (25% of abov	1.0	LS	-	43,878
	Total				219,392
	Rate per 1 m3				717
	Say				720

Work Item ; Excavation with Steel Sheet Piles

Data for : Excavation B=3.0m, L=10.0m, H=3.0m 180.0 m3

	Description of Item	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
	Excavation (H≦1.5, Ordinal soil)	90.00	m3	217.50	19,575
	Excavation (1.5<H≦3. 0, Ordinal soil)	90.00	m3	291.00	26,190
	Preparation of Base	30.00	m2	500.00	15,000
	Cofferdam Sheet pile Driving & Removal	510.00	m	450.00	229,500
	Sheet piles hire(2month)	73.78	t month	12,500.00	922,250
	Support(H-300*300)(2month)	7.80	t month	8,000.00	62,400
	Dewatering	180.00	m3	232.00	41,760
	Miscellaneous(3% of above)	1.0	LS	-	39,500
	Indirect cost from preliminaries and management etc. (25% of abov	1.0	LS	-	339,044
	Total				1,695,219
	Rate per 1 m3				9,418
	Say				9,400

Work Item : Driving Piles

Data for : Diving of piles 355*355 10.0 m

	Description of Item	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
	Product of Pile (L=10.667m)	1.0	Nos	26,400.60	26,401
	Transport of Pile (Distance 100km)	1066.7	m*km	3.60	3,840
	Driving	10.667	m	2,259.00	24,097
	Miscellaneous(3% of above)	1.0	LS	-	1,630
	Indirect cost from preliminaries and management etc. (25% of abov	1.0	LS	-	13,992
	Total				69,959
	Rate per 1 m				6,996
	Say				7,000

Work Item : Caisson

Data for : Caisson 3.5m*3m, L=7m 90.0 m3

	Description of Item	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
	Concrete	49.87	m3	5,054.00	252,053
	Formwork	193.04	m2	772.00	149,027
	Reinforcement	2.99	t	66,250.00	198,241
	Excavation (H≦1.5, Ordinal soil)	18.00	m3	652.50	11,745
	Excavation (1.5<H≦3. 0, Ordinal soil)	18.00	m3	873.00	15,714
	Excavation (3.0<H≦4. 5, Ordinal soil)	18.00	m3	1,093.50	19,683
	Excavation (4.5<H≦6. 0, Ordinal soil)	18.00	m3	1,314.00	23,652
	Excavation (6.0<H≦7. 5, Ordinal soil)	12.00	m3	1,534.50	18,414
	Excavation (6.0<H≦7. 5, Hard soil)	6.00	m3	1,866.00	11,196
	Dewatering	90.00	m3	232.00	20,880
	Miscellaneous(10% of above)	1.0	LS	-	72,061
	Indirect cost from preliminaries and management etc. (25% of abov	1.0	LS	-	198,166
	Total				990,832
	Rate per 1 m3				11,009
	Say				11,000

Work Item : Stone Masonry

Data for : Stone Masonry (H=5.0m, i=0.5) 5.6 m2

	Description of Item	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
	Stone Masonry (Result of interview)	5.6	m2	4,200.00	23,520
	Cofferdam Sheet pile Driving & Removal	15.00	m	450.00	6,750
	Sheet piles hire(1month)	1.09	t.month	12,500.00	13,563
	Indirect cost from preliminaries and management etc. (25% of abov	1.0	LS	-	10,958
	Total				54,791
	Rate per 1 m3				9,784
	Say				9,800

Work Item : Mat Gabion

Data for : Mat gabion 2.0*1.2*0.5 1.0 Nos

	Description of Item	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
	Result of interview				
	Mat gabions(CIF Colombo)	1.0	Nos	9,000.00	9,000
	Mat gabions(Customs Duties, Transportation)	1.0	Nos	10,000.00	10,000
	Boulders	1.44	m3	2,000.00	2,880
	Skilled A	2.0	Day	500.00	1,000
	Skilled B	7.0	Day	350.00	2,450
	Unskilled	7.0	Day	250.00	1,750
	Crane 15t	0.3	Day	28,000.00	8,400
	Boom Truck	0.2	Day	20,000.00	4,000
	Indirect cost from preliminaries and management etc. (25% of abov	1.0	LS	-	9,870
	Total				49,350
	Rate per 1 No.				49,350
	Say				49,400

Work Item : Approach Road

Data for : Approach Road W=9.2m (6.8m + 2*1.2m) 150.0 m

	Description of Item	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
	RDA Estimation	1.0	LS		2,136,073
	Indirect cost from preliminaries and management etc. (25% of abov	1.0	LS	-	534,018
	Total				2,670,091
	Rate per 1 m				17,801
	Say				17,800

Work Item : Temporary Jetty

Data for : Temporary Jetty W=6.0m, L=12m 72.0 m2

	Description of Item	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
	Result of interview				
	1. Material				4,257,960
	H-300*300(CIF Colombo)	62.0	t	33,000.00	2,046,000
	H-300*300(Customs duties, Transportation)	62.0	t	11,500.00	713,000
	Cover Deck 2.0*1.0*0.2 (CIF Colombo)	36.0	Nos	24,000.00	864,000
	Cover Deck (Customs duties, Transportation)	36.0	Nos	11,500.00	414,000
	L-50*50 (CIF Colombo)	0.4	t	34,000.00	13,600
	L-50*50 (Customs duties, Transportation)	0.4	t	11,500.00	4,600
	Miscellaneous Material	1.0	LS		202,760
	2. Machinery				467,250
	Crawler Crane 40t	5.0	Day	60,000.00	300,000
	Vibro-pile hammer 80k	3.0	Day	16,000.00	48,000
	Generator 250kVA	3.0	Day	19,000.00	57,000
	Boom Track	2.0	Day	20,000.00	40,000
	Others	1.0	LS		22,250
	3. Labour				35,000
	Skilled A	10.0	Day	500.00	5,000
	Skilled B	50.0	Day	350.00	17,500
	Unskilled	50.0	Day	250.00	12,500
	Indirect cost from preliminaries and management etc. (25% of abo	1.0	LS		1,190,053
	Total				5,950,263
	Rate per 1 m2				82,643
	Say				82,600

Work Item : Land Acquisition

Data for : Land Acquisition 1.0 m2

	Description of Item	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
	Results of Interview from RDA	1.0	m2	400.00	400
	Total				400
	Rate per 1 m2				400
	Say				400

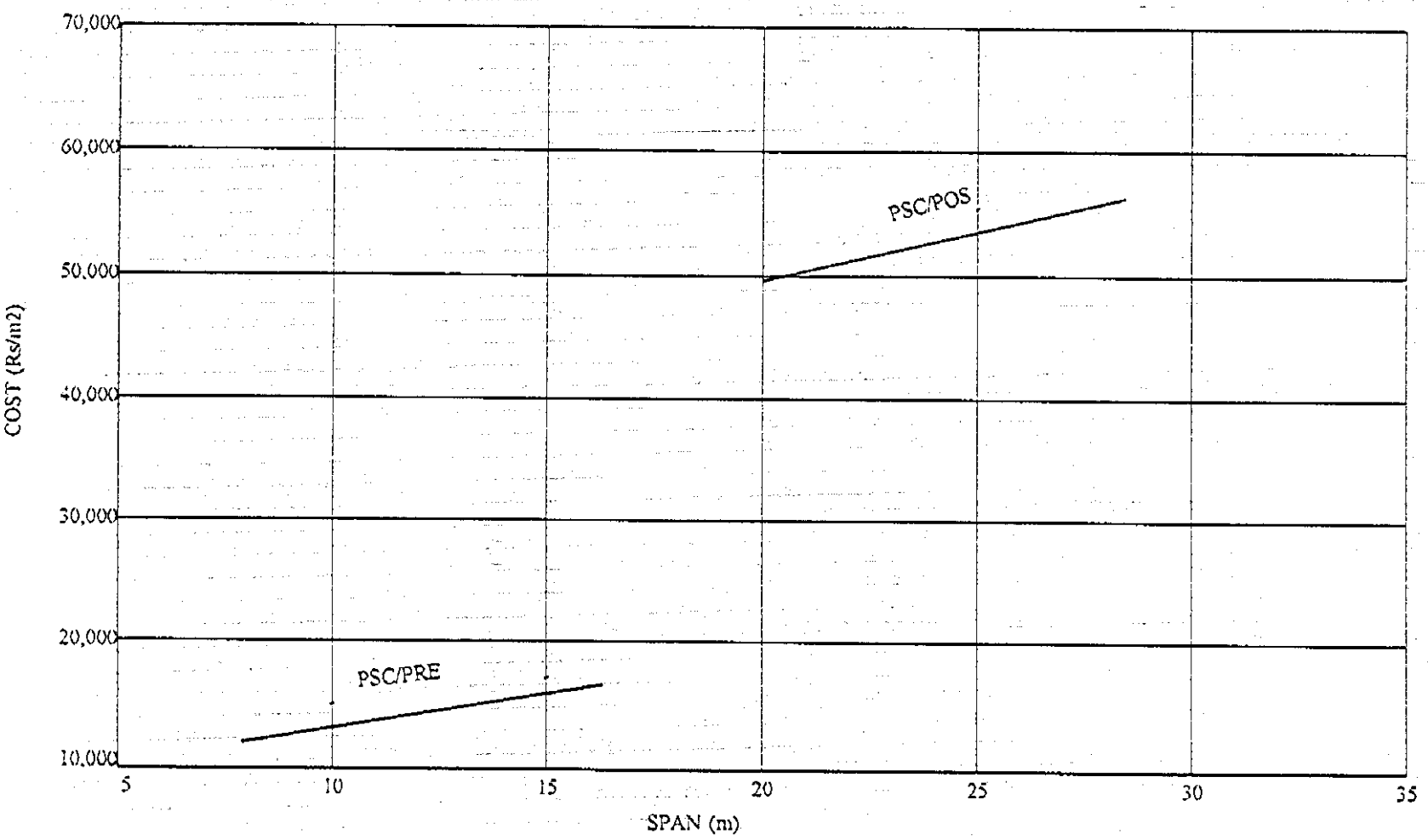

Figure S.1 Construction Cost of PC Bridge

Work Item : Superstructure PSC/PRE L=16.23m

Data for : 3 spans of 16.23m W=9.2m 448.0 m2

	Description of Item	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
	Concrete ClassA Grade 40(20)	185.0	m3	5,900.00	1,091,500
	Concrete ClassA Grade 25(20)	40.0	m3	5,440.00	217,600
	Formwork	198	m2	772.00	152,856
	Reinforcement Grade 250	6.41	t	61,750.00	395,972
	Reinforcement Grade 460	1.85	t	66,250.00	122,231
	PSC/PRE Beam Supplied	42	Nos	64,584.00	2,712,528
	PSC/PRE Beam Launched into position	42	Nos	5,719.50	240,219
	Railing RC Precast Railing	120.4	m	2,088.00	251,395
	End Pillasters Type1	2	Nos	45,018.00	90,036
	End Pillasters Type3	2	Nos	18,205.00	36,410
	Bridge Surface	448.0	m3	1,260.00	564,480
	Indirect cost from preliminaries and management etc. (25% of abov	1.0	LS	-	1,468,807
	Total				7,344,034
	Rate per 1 m2				16,393
	Say				16,400

Work Item : Superstructure PSC/PRE L=9.83m

Data for : 3 spans of 9.83m W=9.2m 272.2 m2

	Description of Item	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
	Concrete ClassA Grade 40(20)	80.0	m3	5,900.00	472,000
	Concrete ClassA Grade 25(20)	22.0	m3	5,440.00	119,680
	Formwork	105	m2	772.00	81,060
	Reinforcement Grade 250	2.91	t	61,750.00	179,507
	Reinforcement Grade 460	0.84	t	66,250.00	55,412
	PSC/PRE Beam Supplied	42	Nos	27,439.00	1,152,438
	PSC/PRE Beam Launched into position	42	Nos	3,278.10	137,680
	Railing RC Precast Railing	82	m	2,088.00	171,216
	End Pillasters Type1	2	Nos	45,018.00	90,036
	End Pillasters Type3	2	Nos	18,205.00	36,410
	Bridge Surface	272.2	m3	1,260.00	342,972
	Indirect cost from preliminaries and management etc. (25% of abov	1.0	LS	-	709,603
	Total				3,548,014
	Rate per 1 m2				13,035
	Say				13,000

Work Item : Superstructure PSC/POS L=28.2m

Data for : 3 spans of 28.2m W=9.2m 779.0 m2

	Description of Item	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
	Main Structure				
	Production of Main Beam	15	Nos	1,590,000.00	23,850,000
	Bearing	15	Nos	92,300.00	1,384,500
	Slab and Cross beam	3.0	Spans	3,650,000.00	10,950,000
	Railing RC Precast Railing	192	m	2,088.00	400,896
	End Pillasters Type1	2	Nos	45,018.00	90,036
	End Pillasters Type3	2	Nos	18,205.00	36,410
	Bridge Surface	779.0	m3	1,260.00	981,540
	Indirect cost from preliminaries and management etc. (25% of abov	1.0	LS	-	5,962,500
	Total				43,655,882
	Rate per 1 m2				56,041
	Say				56,000

Work Item : Superstructure PSC/POS L=23.14m

Data for : 3 spans of 23.14m W=9.2m 639.6 m2

	Description of Item	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
	Main Structure				
	Production of Main Beam	15	Nos	1,220,000.00	18,300,000
	Bearing	15	Nos	74,800.00	1,122,000
	Slab and Cross beam	3.0	Spans	2,700,000.00	8,100,000
	Railing RC Precast Railing	161.84	m	2,088.00	337,922
	End Pillasters Type1	2	Nos	45,018.00	90,036
	End Pillasters Type3	2	Nos	18,205.00	36,410
	Bridge Surface	639.6	m3	1,260.00	805,876
	Indirect cost from preliminaries and management etc. (25% of abov	1.0	LS	-	4,575,000
	Total				33,367,244
	Rate per 1 m2				52,170
	Say				52,200

Break down : Production of Main Beam L=28.2m

Data for : 3 spans, 15.0 Nos

Item	Specification	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
Concrete	ClassA Grade45	182.7	m3	6,100.00	1,114,690
Formwork		1,744.7	m2	2,849.00	4,970,713
Reinforcement		20,101.0	kg	114.95	2,310,605
PC Cable	12-ϕ7	3,807.0	m	2,029.50	7,726,307
Prestressing		135.0	cable	15,950.00	2,153,250
Falsework		87.6	m	880.00	77,088
Machinary for above		15.0	Nos	143,770.00	2,156,550
Treatment of MB stand		87.6	m	341.00	29,872
MB stand		87.6	m	24,024.00	2,104,502
Temporary stock		12.0	Nos	79,750.00	957,000
Gantry crane		1.0	Nos	124,300.00	124,300
Rail for above		29.2	m	2,750.00	80,300
Total					23,805,176
Rate per 1 Nos					1,587,012
Say					1,590,000

Break down : Slab and Cross beam L=28.2m

Data for : 3 spans, 3.0 Spans

Item	Specification	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
Concrete	ClassA Grade40	189.6	m3	6,100.00	1,156,560
Formwork		948.1	m2	6,380.00	6,048,878
Reinforcement		17,064.0	kg	87.45	1,492,247
PC Cable	12-ϕ7	662.4	m	1,419.00	939,946
Prestressing		72.0	cable	9,460.00	681,120
Falsework for safety		84.7	m2	880.00	74,536
Machinary for prestressing		15.0	Nos	37,730.00	565,950
Total					10,959,236
Rate per 1 Span					3,653,079
Say					3,650,000

Break down : Production of Main Beam L=23.14m

Data for : 3 spans, 15.0 Nos

Item	Specification	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
Concrete	ClassA Grade45	128.8	m3	6,100.00	785,522
Formwork		1,109.4	m2	2,849.00	3,160,551
Reinforcement		14,165.2	kg	114.95	1,628,284
PC Cable	12-ϕ7	2,776.8	m	2,029.50	5,635,516
Prestressing		120.0	cable	15,950.00	1,914,000
Falsework		72.4	m	880.00	63,730
Machinary for above		15.0	Nos	143,770.00	2,156,550
Treatment of MB stand		72.4	m	341.00	24,695
MB stand		72.4	m	24,024.00	1,739,818
Temporary stock		12.0	Nos	79,750.00	957,000
Gantry crane		1.0	Nos	124,300.00	124,300
Rail for above		24.1	m	2,750.00	66,385
Total					18,256,350
Rate per 1 Nos					1,217,090
Say					1,220,000

Break down : Slab and Cross beam L=13.14m

Data for : 3 spans, 3.0 Spans

Item	Specification	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
Concrete	ClassA Grade40	93.4	m3	6,100.00	569,740
Formwork		731.4	m2	6,380.00	4,666,332
Reinforcement		8,406.0	kg	87.45	735,105
PC Cable	12-ϕ7	662.4	m	1,419.00	939,946
Prestressing		60.0	cable	9,460.00	567,600
Falsework for safety		69.5	m2	880.00	61,178
Machinary for prestressing		15.0	Nos	37,730.00	565,950
Total					8,105,850
Rate per 1 Span					2,701,950
Say					2,700,000

Work Item : Superstructure Steel Box Beam L=50.00m

Data for : 1 spans of 50.00m W=9.2m 460.0 m2

	Description of Item	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
	Steel (Fablication)	145.0	t	298,000.00	43,210,000
	Steel (Transportation from Japan)	145.0	t	117,000.00	16,965,000
	Erection (Cable erection)	145.0	t	515,500.00	74,747,500
	Steel (Custom duties, Domestic transportation)	145.0	t	11,500.00	1,667,500
	Concrete	160	m3	5,054.00	808,640
	Reinforcement	35.2	t	66,250.00	2,332,000
	Formwork	280	m2	772.00	216,160
	End Pillasters Type1	2	Nos	45,018.00	90,036
	End Pillasters Type3	2	Nos	18,205.00	36,410
	Bridge Surface	460.0	m3	1,260.00	579,600
	Indirect cost from preliminaries and management etc. (25% of abo	1.0	LS	-	35,163,212
	Total				175,816,058
	Rate per 1 m2				382,209
	Say				382,000

Break down : Fablication of Str. Box beam L=50.00m

Data for : 1 span 145.0 ton

Item	Specification	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
Material					11,718,600
Steel plate	SM 490Y	95.0	t	67,500.00	6,412,500
Steel plate	SS400	45.0	t	67,500.00	3,037,500
HTB M22	F10T	4.0	t	137,500.00	550,000
Stud ϕ22*120		1.0	t	400,000.00	400,000
Bearing	BPA 125ton	8.0	Nos	156,250.00	1,250,000
Expantion Joint l=9.2m	Neoplane	2.0	Nos	34,300.00	68,600
Fablication		140.0	t	164,300.00	23,002,000
Painting (Inside)	Tar-epoxy paint	1,770.0	m2	1,470.00	2,601,900
Painting (Outside)	B1	985.0	m2	1,980.00	1,950,300
Asministration (10%)					3,927,280
Total					43,200,080
Rate per 1 ton					297,932
Say					298,000

Break down : Transportation of Str. Box beam L=50.00m

Data for : 1 span 145.0 ton

Item	Specification	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
Transportation in Japan		1.0	LS	500,000.00	500,000
Packing (Bridge & Erection)		1.0	LS	2,500,000.00	2,500,000
Custom		1.0	LS	5,000.00	5,000
Loading to ship		1,400.0	m3	3,750.00	5,250,000
Marine Transportation		1,400.0	m3	4,460.00	6,244,000
Insurance	BPA 125ton	1.0	LS	2,500,000.00	2,500,000
Total					16,999,000
Rate per 1 ton					117,234
Say					117,000

Break down : Election of Str. Box beam L=50.00m

Data for : Cable crane, 1 span 145.0 ton

Item	Specification	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
Equipment		1.0	LS	55,500,000.00	55,500,000
Anchorage and foundation of pylon		1.0	LS	5,000,000.00	5,000,000
Election of main beam		1.0	LS	5,000,000.00	5,000,000
Instration of Bearings		1.0	LS	550,000.00	550,000
Bolt up		1.0	LS	950,000.00	950,000
Falsework		1.0	LS	7,000,000.00	7,000,000
Painting (Inside)	Tar-epoxy paint	55.0	m2	8,200.00	451,000
Painting (Outside)	F2	55.0	m2	5,450.00	299,750
Total					74,750,750
Rate per 1 ton					515,522
Say					515,500

Note : Volume of transportion

Steel members of main beam	145 t * 5.0 m3/t =	725 m3
Facilities for erection		675 m3
	TOtal	1,400 m3

Work Item : RC Retaining wall H=5.0m

Data for Retaining Wall H=5.0m 10.0 m

	Description of Item	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
	Concrete	31.6	m3	5,054.00	159,706
	Formwork	106.4	m2	772.00	82,141
	Reinforcement	1.0	t	66,250.00	66,250
	Drainage Backfill Material	27	m3	1,000.00	27,000
	Excavation (Open)	110	m3	800.00	88,000
	Miscellaneous(3% of above)	1.0	LS	-	12,693
	Indirect cost from preliminaries and management etc. (25% of abov	1.0	LS	-	108,948
	Total				544,738
	Rate per 1 m				54,474
	Say				54,500

Work Item : RC Retaining wall H=4.0m

Data for Retaining Wall H=4.0m 10.0 m

	Description of Item	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
	Concrete	24.9	m3	5,054.00	125,845
	Formwork	82.5	m2	772.00	63,690
	Reinforcement	0.7	t	66,250.00	46,375
	Drainage Backfill Material	21	m3	1,000.00	21,000
	Excavation (Open)	98	m3	800.00	78,400
	Miscellaneous(3% of above)	1.0	LS	-	10,059
	Indirect cost from preliminaries and management etc. (25% of abov	1.0	LS	-	86,342
	Total				431,711
	Rate per 1 m				43,171
	Say				43,200

Work Item : RC Retaining wall H=3.0m

Data for Retaining Wall H=3.0m 10.0 m

	Description of Item	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
	Concrete	20.6	m3	5,054.00	104,112
	Formwork	62.1	m2	772.00	47,941
	Reinforcement	0.6	t	66,250.00	39,750
	Drainage Backfill Material	15	m3	1,000.00	15,000
	Excavation (Open)	98	m3	800.00	78,400
	Miscellaneous(3% of above)	1.0	LS	-	8,556
	Indirect cost from preliminaries and management etc. (25% of abov	1.0	LS	-	73,440
	Total				367,200
	Rate per 1 m				36,720
	Say				36,700

Summary of Construction Cost for Representative Bridges

SER No.	Bridge Length L (m)	Width W (m)	Area=L*B A (m2)	Cost (MRs.)	Rate per m2 (TRs.)	Type of structure		Remark
						Superstructure	Foundation	
212	48.790	9.80	478	49.5	104	3*PSC/PRE 16.23m	Existing Caisson	Alternative 1
212	48.790	9.80	478	51.5	108	3*PSC/PRE 16.23m	Piled	Alternative 2
77	120.000	9.80	1176	121.2	103	2*PSC/POS 20.0m 2*4*PSC/PRE 10.0m	Spread	
53	46.355	9.20	426	67.3	158	2*PSC/POS 23.14m	Caisson	
211	23.275	9.80	228	38.8	170	2*PSC/PRE 11.6m	Piled	
33	76.000	9.20	699	252.6	361	Stl.Box 50.0m PSC/PRE 16.0m PSC/PRE 10.0m	Caisson	
59	45.100	9.20	415	59.3	143	3*PSC/PRE 15.0m	Piled	
20	18.075	9.20	166	19.4	116	2*PSC/PRE 9.0m	Spread	
70	43.600	11.00	480	64.7	135	3*PSC/PRE 14.5m	Caisson	
7	146.320	9.20	1346	166.8	124	9*PSC/PRE 16.23m	Piled	

Cost Estimate for Representative Bridges

Ser. No. 212 Alternative 1

	Item	Qty	Unit	Rate (Rs)	Amount (Rs)
	Superstructure				7,839,200
	PSC/PRE L=16.23m	478.00	m2	16,400.00	7,839,200
	Substructure				15,618,000
	A1	1.00	Nos	5,445,000.00	5,445,000
	A2	1.00	Nos	5,445,000.00	5,445,000
	P1	1.00	Nos	2,364,000.00	2,364,000
	P2	1.00	Nos	2,364,000.00	2,364,000
	Approach Road	30.00	m	17,800.00	534,000
	Masonry	134.00	m2	9,800.00	1,313,200
	Matgabion	0.00	Nos	49,400.00	0
	Temporary Jetty W=6.0m	293.00	m2	82,600.00	24,201,800
	Total				49,506,200
	Rate per m2				103,569

Ser. No. 212 Alternative 2

	Item	Qty	Unit	Rate (Rs)	Amount (Rs)
	Superstructure				7,839,200
	PSC/PRE L=16.23m	478.00	m2	16,400.00	7,839,200
	Substructure				17,644,000
	A1	1.00	Nos	4,988,000.00	4,988,000
	A2	1.00	Nos	5,303,000.00	5,303,000
	P1	1.00	Nos	3,414,000.00	3,414,000
	P2	1.00	Nos	3,939,000.00	3,939,000
	Approach Road	30.00	m	17,800.00	534,000
	Masonry	134.00	m2	9,800.00	1,313,200
	Matgabion	0.00	Nos	49,400.00	0
	Temporary Jetty W=6.0m	293.00	m2	82,600.00	24,201,800
	Total				51,532,200
	Rate per m2				107,808

Ser. No. 77

	Item	Qty	Unit	Rate (Rs)	Amount (Rs)
	Superstructure				29,792,000
	PSC/PRE L=10.0m	784.00	m2	13,100.00	10,270,400
	PSC/POS L=20,0m	392.00	m2	49,800.00	19,521,600
	Substructure				30,927,000
	A1	1.00	Nos	2,944,000.00	2,944,000
	A2	1.00	Nos	3,005,000.00	3,005,000
	P1, P2, P3, P7, P8, P9	6.00	Nos	2,516,000.00	15,096,000
	P4. P6	2.00	Nos	3,102,000.00	6,204,000
	P5	1.00	Nos	3,678,000.00	3,678,000
	Concrete Wall (H ave.=3m)	14.00	m	36,700.00	513,800
	Approach Road	30.00	m	17,800.00	534,000
	Masonry	0.00	m2	9,800.00	0
	Matgabion	0.00	Nos	49,400.00	0
	Temporary Jetty W=6.0m	720.00	m2	82,600.00	59,472,000
	Total				121,238,800
	Rate per m2				103,094

Ser. No. 53

	Item	Qty	Unit	Rate (Rs)	Amount (Rs)
	Superstructure				22,237,200
	PSC/POS L=23.14m	426.00	m2	52,200.00	22,237,200
	Substructure				17,777,000
	A1	1.00	Nos	6,089,000.00	6,089,000
	A2	1.00	Nos	6,439,000.00	6,439,000
	P1	1.00	Nos	5,249,000.00	5,249,000
	Approach Road	60.00	m	17,800.00	1,068,000
	Masonry	335.00	m2	9,800.00	3,283,000
	Matgabion	0.00	Nos	49,400.00	0
	Temporary Jetty W=6.0m	278.00	m2	82,600.00	22,962,800
	Total				67,328,000
	Rate per m2				158,047

Ser. No. 211

	Item	Qty	Unit	Rate (Rs)	Amount (Rs)
	Superstructure				3,169,200
	PSC/PRE L=11.6m	228.00	m2	13,900.00	3,169,200
	Substructure				14,171,000
	A1	1.00	Nos	5,169,000.00	5,169,000
	A2	1.00	Nos	4,875,000.00	4,875,000
	P1	1.00	Nos	4,127,000.00	4,127,000
	Approach Road	40.00	m	17,800.00	712,000
	Masonry	179.00	m2	9,800.00	1,754,200
	Matgabion	150.00	Nos	49,400.00	7,410,000
	Temporary Jetty W=6.0m	140.00	m2	82,600.00	11,564,000
	Total				38,780,400
	Rate per m2				170,089

Ser. No. 33

	Item	Qty	Unit	Rate (Rs)	Amount (Rs)
	Superstructure				179,321,300
	PSC/PRE L=16.0m	147.00	m2	16,300.00	2,396,100
	PSC/PRE L=10.0m	92.00	m2	13,100.00	1,205,200
	Steel Box L=50.0m	460.00	m2	382,000.00	175,720,000
	Substructure				29,891,000
	A1	1.00	Nos	6,536,000.00	6,536,000
	A2	1.00	Nos	5,932,000.00	5,932,000
	P1	1.00	Nos	8,445,000.00	8,445,000
	P2	1.00	Nos	8,978,000.00	8,978,000
	Approach Road	135.00	m	17,800.00	2,403,000
	Masonry	335.00	m2	9,800.00	3,283,000
	Matgabion	0.00	Nos	49,400.00	0
	Temporary Jetty W=6.0m	456.00	m2	82,600.00	37,665,600
	Total				252,563,900
	Rate per m2				361,322

Ser. No. 59

	Item	Qty	Unit	Rate (Rs)	Amount (Rs)
	Superstructure				6,515,500
	PSC/PRE L=15.0m	415.00	m2	15,700.00	6,515,500
	Substructure				21,322,000
	A1	1.00	Nos	6,988,000.00	6,988,000
	A2	1.00	Nos	6,652,000.00	6,652,000
	P1	1.00	Nos	3,841,000.00	3,841,000
	P2	1.00	Nos	3,841,000.00	3,841,000
	Approach Road	30.00	m	17,800.00	534,000
	Masonry	112.00	m2	9,800.00	1,097,600
	Matgabion	150.00	Nos	49,400.00	7,410,000
	Temporary Jetty W=6.0m	271.00	m2	82,600.00	22,384,600
	Total				59,263,700
	Rate per m2				142,804

Ser. No. 20

	Item	Qty	Unit	Rate (Rs)	Amount (Rs)
	Superstructure				2,091,600
	PSC/PRE L=9.0m	166.00	m2	12,600.00	2,091,600
	Substructure				4,288,000
	A1	1.00	Nos	1,507,000.00	1,507,000
	A2	1.00	Nos	1,437,000.00	1,437,000
	P1	1.00	Nos	1,344,000.00	1,344,000
	Approach Road	105.00	m	17,800.00	1,869,000
	Masonry	224.00	m2	9,800.00	2,195,200
	Matgabion	0.00	Nos	49,400.00	0
	Temporary Jetty W=6.0m	108.00	m2	82,600.00	8,920,800
	Total				19,364,600
	Rate per m2				116,654

Ser. No. 70

	Item	Qty	Unit	Rate (Rs)	Amount (Rs)
	Superstructure				7,440,000
	PSC/PRE L=14.5m	480.00	m2	15,500.00	7,440,000
	Substructure				25,956,000
	A1	1.00	Nos	7,237,000.00	7,237,000
	A2	1.00	Nos	7,793,000.00	7,793,000
	P1	1.00	Nos	5,240,000.00	5,240,000
	P2	1.00	Nos	5,686,000.00	5,686,000
	Approach Road	30.00	m	17,800.00	534,000
	Masonry	179.00	m2	9,800.00	1,754,200
	Matgabion	150.00	Nos	49,400.00	7,410,000
	Temporary Jetty W=6.0m	262.00	m2	82,600.00	21,641,200
	Total				64,735,400
	Rate per m2				134,865

Ser. No. 7

	Item	Qty	Unit	Rate (Rs)	Amount (Rs)
	Superstructure				22,074,400
	PSC/PRE L=16.23m	1,346.00	m2	16,400.00	22,074,400
	Substructure				62,314,000
	A1	1.00	Nos	6,719,000.00	6,719,000
	A2	1.00	Nos	6,131,000.00	6,131,000
	P1 - P8	8.00	Nos	6,183,000.00	49,464,000
	Approach Road	30.00	m	17,800.00	534,000
	Masonry	201.00	m2	9,800.00	1,969,800
	Matgabion	150.00	Nos	49,400.00	7,410,000
	Temporary Jetty W=6.0m	878.00	m2	82,600.00	72,522,800
	Total				166,825,000
	Rate per m2				123,941

Cost Estimation for Substructure and Foundation

Str. No. 212 A1 Alternative 1

	Item	Qty	Unit	Rate	Amount
	Concrete	81.16	m3	11,400.00	925,181
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	480.85	m3	9,400.00	4,519,990
	Subtotal				5,445,171
	Foundation (Existing caisson)	0.00	m		0
	Total				5,445,171

Str. No. 212 A2 Alternative 1

	Item	Qty	Unit	Rate	Amount
	Concrete	81.16	m3	11,400.00	925,181
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	480.85	m3	9,400.00	4,519,990
	Subtotal				5,445,171
	Foundation (Existing caisson)	0.00	m	0.00	0
	Total				5,445,171

Str. No. 212 P1 Alternative 1

	Item	Qty	Unit	Rate	Amount
	Concrete	73.20	m3	11,100.00	812,520
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	165.00	m3	9,400.00	1,551,000
	Subtotal				2,363,520
	Foundation (Existing caisson)	0.00	m	0.00	0
	Total				2,363,520

Str. No. 212 P2 Alternative 1

	Item	Qty	Unit	Rate	Amount
	Concrete	73.20	m3	11,100.00	812,520
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	165.00	m3	9,400.00	1,551,000
	Subtotal				2,363,520
	Foundation (Existing caisson)	0.00	m	0.00	0
	Total				2,363,520

Cost Estimate for Substructure and Foundation

Ser No. 212 A1 Alternative 2

	Item	Qty	Unit	Rate	Amount
	Concrete	67.66	m3	11,400.00	771,281
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	348.10	m3	9,400.00	3,272,140
	Subtotal				4,043,421
	Foundation Piles 355*355	135.00	m	7,000.00	945,000
	Total				4,988,421

Ser No. 212 A2 Alternative 2

	Item	Qty	Unit	Rate	Amount
	Concrete	67.66	m3	11,400.00	771,281
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	348.10	m3	9,400.00	3,272,140
	Subtotal				4,043,421
	Foundation Piles 355*355	180.00	m	7,000.00	1,260,000
	Total				5,303,421

Ser No. 212 P1 Alternative 2

	Item	Qty	Unit	Rate	Amount
	Concrete	73.20	m3	11,100.00	812,520
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	165.00	m3	9,400.00	1,551,000
	Subtotal				2,363,520
	Foundation Piles 355*355	150.00	m	7,000.00	1,050,000
	Total				3,413,520

Ser No. 212 P2

	Item	Qty	Unit	Rate	Amount
	Concrete	73.20	m3	11,100.00	812,520
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	165.00	m3	9,400.00	1,551,000
	Subtotal				2,363,520
	Foundation Piles 355*355	225.00	m	7,000.00	1,575,000
	Total				3,938,520

Cost Estimate for Substructure and Foundation

Ser. No. 77 A1

	Item	Qty	Unit	Rate	Amount
	Concrete	191.49	m3	11,400.00	2,182,993
	Excavation Open	1,057.32	m3	720.00	761,270
	Excavation Cofferdam	0.00	m3	9,400.00	0
	Subtotal				2,944,264
	Foundation	0.00	m		0
	Total				2,944,264

Ser. No. 77 A2

	Item	Qty	Unit	Rate	Amount
	Concrete	196.81	m3	11,400.00	2,243,671
	Excavation Open	1,057.32	m3	720.00	761,270
	Excavation Cofferdam	0.00	m3	9,400.00	0
	Subtotal				3,004,941
	Foundation	0.00	m		0
	Total				3,004,941

Ser No. 77 P1, P2, P3, P7, P8, P9

	Item	Qty	Unit	Rate	Amount
	Concrete	203.04	m3	11,100.00	2,253,744
	Excavation Open	364.70	m3	720.00	262,584
	Excavation Cofferdam	0.00	m3	9,400.00	0
	Subtotal				2,516,328
	Foundation	0.00	m		0
	Total				2,516,328

Ser. No. 77 P4, P6

	Item	Qty	Unit	Rate	Amount
	Concrete	257.27	m3	11,100.00	2,855,642
	Excavation Open	342.75	m3	720.00	246,780
	Excavation Cofferdam	0.00	m3	9,400.00	0
	Subtotal				3,102,422
	Foundation	0.00	m		0
	Total				3,102,422

Ser. No. 77 P5

	Item	Qty	Unit	Rate	Amount
	Concrete	303.38	m3	11,100.00	3,367,562
	Excavation Open	430.85	m3	720.00	310,212
	Excavation Cofferdam	0.00	m3	9,400.00	0
	Subtotal				3,677,774
	Foundation		m		0
	Total				3,677,774

Cost Estimation for Substructure and Foundation

Str. No. 53 A1

	Item	Qty	Unit	Rate	Amount
	Concrete	147.71	m3	11,400.00	1,683,885
	Excavation Open	343.32	m3	720.00	247,190
	Excavation Cofferdam	0.00	m3	9,400.00	0
	Subtotal				1,931,076
	Foundation Caisson	378.00	m3	11,000.00	4,158,000
	Total				6,089,076

Str. No. 53 A2

	Item	Qty	Unit	Rate	Amount
	Concrete	147.71	m3	11,400.00	1,683,885
	Excavation Open	829.48	m3	720.00	597,227
	Excavation Cofferdam	0.00	m3	9,400.00	0
	Subtotal				2,281,113
	Foundation Caisson	378.00	m3	11,000.00	4,158,000
	Total				6,439,113

Str. No. 53 P1

	Item	Qty	Unit	Rate	Amount
	Concrete	189.04	m3	11,100.00	2,098,344
	Excavation Open	250.50	m3	720.00	180,360
	Excavation Cofferdam	0.00	m3	9,400.00	0
	Subtotal				2,278,704
	Foundation Caisson	270.00	m3	11,000.00	2,970,000
	Total				5,248,704

Cost Estimation for Substructure and Foundation

Str. No. 211 A1

	Item	Qty	Unit	Rate	Amount
	Concrete	72.37	m3	11,400.00	824,965
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	328.13	m3	9,400.00	3,084,381
	Subtotal				3,909,345
	Foundation Piles 355*355	180.00	m	7,000.00	1,260,000
	Total				5,169,345

Str. No. 211 A2

	Item	Qty	Unit	Rate	Amount
	Concrete	68.66	m3	11,400.00	782,741
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	328.13	m3	9,400.00	3,084,381
	Subtotal				3,867,122
	Foundation Piles 355*355	144.00	m	7,000.00	1,008,000
	Total				4,875,122

Str. No. 211 P1

	Item	Qty	Unit	Rate	Amount
	Concrete	126.96	m3	11,100.00	1,409,256
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	154.00	m3	9,400.00	1,447,600
	Subtotal				2,856,856
	Foundation Piles 355*355	181.50	m	7,000.00	1,270,500
	Total				4,127,356

Cost Estimation for Substructure and Foundation

Str. No. 33 A1

	Item	Qty	Unit	Rate	Amount
	Concrete	113.04	m3	11,400.00	1,288,599
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	300.16	m3	9,400.00	2,821,504
	Subtotal				4,110,103
	Foundation Caisson	220.50	m3	11,000.00	2,425,500
	Total				6,535,603

Str. No. 33 A2

	Item	Qty	Unit	Rate	Amount
	Concrete	96.99	m3	11,400.00	1,105,663
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	255.36	m3	9,400.00	2,400,384
	Subtotal				3,506,047
	Foundation Caisson	220.50	m3	11,000.00	2,425,500
	Total				5,931,547

Str. No. 33 P1

	Item	Qty	Unit	Rate	Amount
	Concrete	209.95	m3	11,100.00	2,330,478
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	229.25	m3	9,400.00	2,154,950
	Subtotal				4,485,428
	Foundation Caisson	360.00	m3	11,000.00	3,960,000
	Total				8,445,428

Str. No. 33 P2

	Item	Qty	Unit	Rate	Amount
	Concrete	207.56	m3	11,100.00	2,303,861
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	183.40	m3	9,400.00	1,723,960
	Subtotal				4,027,821
	Foundation Caisson	450.00	m3	11,000.00	4,950,000
	Total				8,977,821

Cost Estimation for Substructure and Foundation

Str. No. 59 A1

	Item	Qty	Unit	Rate	Amount
	Concrete	63.17	m3	11,400.00	720,094
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	488.04	m3	9,400.00	4,587,589
	Subtotal				5,307,683
	Foundation Piles 355*355	240.00	m	7,000.00	1,680,000
	Total				6,987,683

Str. No. 59 A2

	Item	Qty	Unit	Rate	Amount
	Concrete	63.17	m3	11,400.00	720,094
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	488.04	m3	9,400.00	4,587,589
	Subtotal				5,307,683
	Foundation Piles 355*355	192.00	m	7,000.00	1,344,000
	Total				6,651,683

Str. No. 59 P1,P2

	Item	Qty	Unit	Rate	Amount
	Concrete	122.74	m3	11,100.00	1,362,414
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	143.00	m3	9,400.00	1,344,200
	Subtotal				2,706,614
	Foundation Piles 355*355	162.00	m	7,000.00	1,134,000
	Total				3,840,614

Cost Estimation for Substructure and Foundation

Str. No. 20 A1

	Item	Qty	Unit	Rate	Amount
	Concrete	100.27	m3	11,400.00	1,143,115
	Excavation Open	505.28	m3	720.00	363,802
	Excavation Cofferdam	0.00	m3	9,400.00	0
	Subtotal				1,506,917
	Foundation	0.00	m		0
	Total				1,506,917

Str. No. 20 A2

	Item	Qty	Unit	Rate	Amount
	Concrete	94.75	m3	11,400.00	1,080,173
	Excavation Open	495.08	m3	720.00	356,458
	Excavation Cofferdam	0.00	m3	9,400.00	0
	Subtotal				1,436,630
	Foundation	0.00	m		0
	Total				1,436,630

Str. No. 20 P1

	Item	Qty	Unit	Rate	Amount
	Concrete	111.98	m3	11,100.00	1,242,978
	Excavation Open	140.60	m3	720.00	101,232
	Excavation Cofferdam	0.00	m3	9,400.00	0
	Subtotal				1,344,210
	Foundation	0.00	m		0
	Total				1,344,210

Cost Estimation for Substructure and Foundation

Str. No. 70 A1

	Item	Qty	Unit	Rate	Amount
	Concrete	82.54	m3	11,400.00	940,933
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	338.00	m3	9,400.00	3,177,200
	Subtotal				4,118,133
	Foundation Caisson	283.50	m3	11,000.00	3,118,500
	Total				7,236,633

Str. No. 70 A2

	Item	Qty	Unit	Rate	Amount
	Concrete	116.12	m3	11,400.00	1,323,802
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	338.00	m3	9,400.00	3,177,200
	Subtotal				4,501,002
	Foundation Caisson	299.25	m3	11,000.00	3,291,750
	Total				7,792,752

Str. No. 70 P1

	Item	Qty	Unit	Rate	Amount
	Concrete	132.36	m3	11,100.00	1,469,196
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	180.00	m3	9,400.00	1,692,000
	Subtotal				3,161,196
	Foundation Caisson	189.00	m3	11,000.00	2,079,000
	Total				5,240,196

Str. No. 70 P2

	Item	Qty	Unit	Rate	Amount
	Concrete	132.36	m3	11,100.00	1,469,196
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	180.00	m3	9,400.00	1,692,000
	Subtotal				3,161,196
	Foundation Caisson	229.50	m3	11,000.00	2,524,500
	Total				5,685,696

Cost Estimation for Substructure and Foundation

Str. No. 7 A1

	Item	Qty	Unit	Rate	Amount
	Concrete	72.87	m3	11,400.00	830,684
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	313.60	m3	9,400.00	2,947,840
	Subtotal				3,778,524
	Foundation Piles 355*355	420.00	m	7,000.00	2,940,000
	Total				6,718,524

Str. No. 7 A2

	Item	Qty	Unit	Rate	Amount
	Concrete	72.87	m3	11,400.00	830,684
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	313.60	m3	9,400.00	2,947,840
	Subtotal				3,778,524
	Foundation Piles 355*355	336.00	m	7,000.00	2,352,000
	Total				6,130,524

Str. No. 7 P1 - P8

	Item	Qty	Unit	Rate	Amount
	Concrete	144.70	m3	11,100.00	1,606,126
	Excavation Open	0.00	m3	720.00	0
	Excavation Cofferdam	192.00	m3	9,400.00	1,804,800
	Subtotal				3,410,926
	Foundation Piles 355*355	396.00	m	7,000.00	2,772,000
	Total				6,182,926

4. Construction Cost for 100 Bridges

SER No.86

- Patching for soffit of beam

  A = $1.0 \times 0.5 = 0.5 m^2$

  depth = 0.03m

  V = $0.5 \times 0.03 = 0.015 m^3$

- Primar (¥5,100,000/m^2)

- Resin Morter (¥180,000/m^3) …… SHO-BOND #101

- Tax & Transportation (50% of Material Cost)

- Labour Foreman …… 2Days
  Skilled A …… 1Days
  Skilled B …… 2Days

- Work Cost

  P1 = $\{(0.5 \times 900 + 0.015 \times 2,550,000) \times 1.50 + (250 \times 2 + 270 \times 1 + 161 \times 2)\} \times 1.25$

  = 73,849

SER No.202

- Protection for Abutment against souring

  Vc = $2.0 \times 2.0 \times 2.0m \times 2sides$

  = $16m^3$

- Mat Gabion (2.0×1.2×0.5m)

- N = Vc/1.44 = 12nos

- Work Cost

  P = (49,400) × 12

  = 592,800

SER №212

■ Patching for soffit of beam

A =17.5m²

depth=0.05m

V =17.5×0.05=0.875m³

■ Crack Injection for Super & Substructure

Width(mm)	L(m)	depth(mm)
0.8	1.1	50
4	1.8	
3	3.1	

■ Primer (¥180,000/100m²)

■ Resin Morter (¥5,100,000/m³) …… SHO-BOND #101

■ Epoxy Resin (L=100m, W=0.3m, d=0.3m)

(¥364,020 →¥40,447,000/m³) …… SHO-BOND BL-Seal

BL-Grout

BL-Injector

■ Tax & Transportation(50% of Material Cost)

■ Labour Foreman …… 3days

Skilled A …… 5days

Skilled B …… 9days

SemiSkilled …… 9days

■ Work Cost

P1 = {(17.5×900+0.875×2,550,000+0.001×20,224,000)×150+(250×3+207×5+161×9+137×9)} ×1.25

= 4,256,629

SER No.91

■ Grouting and Injection for crack of Main Slab

■ Grouting

V1 $=1/2\times0.03\times7.30\times0.35\times2$

$=0.077m^3$

■ Crack Injection for Main Slab

width=0.3mm

depth=1.1m

L =2 m

V $=0.0007m^3$

■ Resin Mortar (¥5,100,000/m^3) …… SHO-BOND #101

■ Epoxy Resin (L=100m, W=0.3, d=0.3m)

(¥364,020 →¥40,447,000/m^3) …… SHO-BOND BL-Seal
BL-Grout
BL-Injector

■ Labour Foreman …… 1days
Skilled A …… 2days
Skilled B …… 2days

■ Work Cost

P1 = $((0.007\times2,550,000+0.0007\times20,224,000)\times1.50+$
$(250\times1+207\times2+161\times2))\times1.25$
= 395,932

SER No.7

■ Prepacked Concrete for RC-beams, Patching for Substructure and Crack Injenction for Superstructure & Substructure.

■ Rehabilitation cost for each typical method is calculated by using one sample and them the calculation result is reflected to the other same types.

■ Prepacked Concrete for RC-T beam (A1~P1).

■ Reinforcement Bars

Primer $4,992 \times \frac{180,000}{100} = 8,986 \rightarrow$ 4,493

Concrete → 597,411

Form 14,598×300Rs/m³ → 4,379

Rebar 112kg×66.7 → 7,470

Tipping …… 9Days

0.817m³ 6,4137

hired truck	1,500Rs×9days= 135.00		6,4137
Generator	1,200Rs×9days= 108.00		
Foreman	4×250	4,717	
Skilled A	5×207		
Skilled B	9×161		
SemiSkilled	9×137		
Boat	1,000Rs×2nos×9days = 18,000		
Air Corb	210×8hr ×9days = 15,120		
Mixer	1,000Rs ×2days = 20,00Rs		

■ RC-T beam

0.817m³ (L=21.6m, L'=22.7m)

P1 =((4,493+597,411)×1.50+4,379+
7,470+64,137)×1.25

=1,223,553Rs → 56,646Rs/m

■ RC-T beam Total

L =286.7m

A =0.230×286.7=65.9m²

P2 =286.7×56,646

16,240,408Rs

■ RC-B Total

A =0.302×3.7=1.1m²

P3 =16,240,408×1.1/65.9

=271,084Rs

■ Patching for Substructure

A1 =6.586m²

A2 =0.400m²

depth1=0.05m

depth2=0.01m

V1 =6.586×0.05=0.329m³

V2 =0.4 ×0.01=0.004m³

■ Crack Injection for Substructure

V =0.03326m³

■ Primer (¥180,000/100m²)

■ Resin Morter (¥5,100,000/m³) …… SHO-BOND #101

■ Epoxy Resin (L=100m, W=0.3m, d=0.3m)

(¥364,020 →¥40,447,000/m³) …… SHO-BOND BL-Seal
BL-Grout
BL-Injector

■ Tax & Transportation(50% of Material Cost)

■ Labour Foreman …… 3days
Skilled A …… 8days
Skilled B …… 24days
SemiSkilled …… 24days

■ Work Cost

P1 = { {(6.6×0.4)×900+(0.329×0.004)×2,550,000+0.033×20,224,000)×
150+(250×3+207×8+161×24+137×24)} ×1.25

= 2,867,276Rs

ΣP = 16,240,408+271,084+2,867,276

= 19,378,768Rs

SER №20

■ Redeck of existing bridge, byusing RC-Slab replacement of damaged girder and widening of superstructure & substructure.

■ Demalish of parement, handril and deck

-parement :V =0.05×3.97×14.35
=2.05m³ (4man days)

-handrail :L =14.35×2
=28.7m (2man days)

-deck :V =(0.16×0.135×2+4.30×0.17)×14.35
=11.1m³ (66man days)

-corrngate:W =4.29×(14.35×1.6)×0.006×7850
=4,647kg

■ Additional Girder(L=7.2m, W12-12×6·1/2-305×165-54kg/m)

Replacement −2nos
Additional −nsos
Total 8nos

W =54×7.2×8
=3,110kg

Transportation
:120km

Pant Area : Ap=0.155×4+0.300×2=1.22m
ΣAp=1.22×7.20×8 =70m²

■ Redeck

-Concrete :Vc =(0.5×0.2×2+7.0×0.18)×14.35
=21.0m³

-From A :A =(0.38×2+(7.00−0.15×8))×14.35+
=(0.50×0.20×2+7.00×0.18)×2
=97.1m²

-Reinforcement Bar(200kg/m³)
:W =200.0×21.0
=4,200kg

■ Accessory

-Pavement :A =6.00×14.35=86.1m²(Tack Coat)

V =0.050×6.00×14.35×2.3=9.9t

-Curb :L =14.35×2=28.7m

-Handrail :L =14.35×2=28.7m

-End Pillaster :N =2nos×2

-Expansion Joint:L =7.00×2×2=28.0m

-Rubber Bearing :L =0.40×8nos×4=12.8m

■ Cost of Demolish

-Removal of Pavement

:P1 =137Rs/day×4+52(Tools) = 600Rs/2.05m³

-Removal of Handrails

:P2 =137Rs/day×2+26(Tools) = 300Rs/28.7m³

-Removal of Deck

:P3 =137Rs/day×66 = 9,042

-Generator(3,300Rs/days)

:P4 =3,300Rs/day×(2+17) = 62,700

-Removal of Corrugate Plate

: Foreman ····· 250Rs/day× 4= 1,000
Semi S ····· 161Rs/day×20= 3,220 } 5,220
Tools ····· = 1,000
Unik ····· 20,000Rs/day×5

= 100,000

-Sub Total:P5 = 600+300+9,042+62,700+
5,220+100,000 = 177,862Rs

(A = 4.29×14.35=61.6m² → 2,887Rs/m²

■ Cost for Main Girder

Price :P6 =3.11×31,000Rs/t = 96,422

Transportation(120km)

:P7 =33Rs/km·nos×8×120 = 31,680

Erection(1Piece=389kg,Unik:2days)

:P8 =4,000×2 = 8,000

Pepainting of Existing Girder

:AP1=1.22m/nos×7.20m×(10-2)×1,120

= 78,705

AP2=1.22m/nos×7.20m×(10-2)×1,040

= 73,083

Sub Total :P9 = 287,890Rs(3.11t→92,569Rs/t)

■ Deck

Concrete	:P10=21.0m³×5,440Rs/m³	=	114,240
Reinforcement Bar			
	:P11=4,200kg×67Rs/kg	=	281,400
From	:P12=97.1m²×772Rsm²	=	74,961
Sub Total	:P13=470,601Rs(100.45m² → 4,685Rs/m²)		

■ Bearing(400×32,L=12.8m)

:P14=7,456Rs(12.8m →)

■ Accessory :Refter the example given by R.D.A

End Pillaster(1)	:45,018×2	=	90,036
End Pillaster(2)	:18,205×2	=	36,410
Curb	: 801Rs/m×28.7m	=	22,989
Hand Rails	: 2,088Rs/m×28.7m	=	59,926
Expansion	:7.0×3=21.0m		
	1,780Rs/m×21.0m	=	37,380
Pavement(tack Coat	):10.9Rs/m²×86.1m²	=	938
(Cold Mixing)	:2,845Rs/t×9.9t	=	28,166
			275,845Rs

(A=7.0×14.35=100.45m² → 2,746Rs/m²)

■ Sub Total①

Demolis	=	177,862Rs(2,887Rs/m²)
Main Girder	=	287,890 (92,569Rs/t)
Deck	=	470,601 (4,685Rs/m²)
Bearing	=	7,456
Accessory	=	275,845 (2,746Rs/m²)
		1,219,654Rs(12,142Rs/m²)

■ Substructure

Refer the example given by R.D.A

-Cost for Abutment(B=9.2m, H=10.1m 2nos)

:P01 = 3,736,658Rs(Spread foundation)

-Cost for Pier (B=9.2m, H=10.1m 2nos)

:P02 = 1,624,634Rs(Spread foundation)

-Cost for additional abutment(△B=4.0m, H=5.0m)

$$:P1 = 3,736,658 \times \frac{4.0}{9.2} \times \frac{5.0}{10.1} = 804,274Rs(2nos)$$

-Cost for additional abutment(△B=4.0m, H=5.0m)

$$:P2 = 1,624,634 \times \frac{4.0}{9.2} \times \frac{5.0}{10.1} \times \frac{1}{2} = 87,421Rs(1nos)$$

-Total :P = 891,695Rs(A1 + P1 + A2)

■ Sub Total②

P1 =1,219,654Rs(12,142Rs/m² ··· 100.45m²)

P2 = 891,695Rs(8,877Rs/m² ··· 100.45m²)

P3 =2,111,349×1.25 = 2,639,186Rs

■ Bailey Bridge

Refer the example in Japan

(3months, B=6.0m, L=12.0m, A=72.0m² ¥=570,000 α=1.25)

Po' =570,000×1/72.0m²×1/90days×1/1.25

=70.4yen(→35.2Rs/m²·day)

Po =35.2×1.25=44Rs/m²·day(including α)

P =6.0×14.35×44×10months×30days = 1,136,520Rs

■ Total

P = 2,639,186

P = 1,136,520

3,775,706Rs(100.45m²→37,600Rs/m²)

SER No.129

■ Reconst

A =9.2×4.6=42.3m²(RC)

P1 =42.3×70,000 = 2,961,000

P2 =6.0×4.6×44×6.0month×30days = 218,592

Total = 3,179,592Rs

SER No.33

■ Reconst =252,600,000Rs

SER No.18

■ Reconst

A	=9.2×31.2=287.0m²	
P1	=287.0×15.700	= 4,505,900
A1+A2+P1		= 17,491,000
Mas		= 1,097,600
Mat		= 7,410,000
Jetty	=6.0×31.2×44×17.5months×30days	= 4,324,320
Total		= 34,828,820

SER No.1

■ Reconstruction

A	=11.0×30.0=33.0m²	
L	=30.0m	
P1	=330.0×89.780	= 29,627,400
P2	=6.0×30.0×44×17.5months×30days	= 30,513,450
Total		= 33,785,400

SER No.175

■ Reconst

A	=9.8×4.4=43.1m²	
P1	=43.1×70,000	= 3,017,000
P2	=44×6.0×4.4×6×30	= 209,088
Total		= 3,226,088

SER No.122

■ Reconst

A	=9.2×18.5=170.2m²	
P1	=170.2×50,000	= 8,475,960
P2	=3,005000×2×	= 6,010,000
Jetty	=6.0×18.5×44×13.0months×30days	= 1,904,760
Total		= 16,390,720

SER №72

■ Reconst

A =9.2×12.1=111.3m²

H(Under the Bridge)=7.3m→Ref №20

P1 =111.3×13,900Rs/m²	=	1,547,070
P2 =1,507,000+1,437,000	=	2,944,000(A1+A2)
Masonry	=	2,195,200
Jetty=6.0×12.1×44×12.0months×30days	=	1,149,984
Total	=	7,836,254Rs

SER №38

■ Reconst

A =9.2×17.0=156.4m²

PSC/POS 23.14m;52,200Rs/m²
PSC/PRE 16.23m;16,400Rs/m² } →20,400Rs/m²

P1 =156.4×20,400Rs/m²	=	3,190,560

H(Under the Bridge)=6.0m→Ref №20

P2 =1,507,000+1,437,000	=	2,944,000(A1+A2)
Masonry	=	2,195,200
Jetty=6.0×17.0×44×13.0months×30days	=	1,750,320
Total	=	10,080,080Rs

SER №144

■ Reconst

A =9.8×3.1=30.4m²

Reconst of RCbeam;	=	70,000
P1 =30.4×70,000/m²	=	2,128,000
Jetty=6.0×3.1×44×6.0months×30days	=	147,312
Total	=	2,275,312Rs

SER №31

■ Reconst

A =9.2×12.4=114.1m²

H(Under the Bridge)=3～4m→Ref №20

P1	=114.1×14,300Rs/m²	= 1,631,630
P2	=(A1+A2)	= 2,944,000
Masonry		= 2,195,200
Jetty	=6.0×12.4×44×12.0months×30days	= 1,178,496
Total		= 7,949,326Rs

SER №32

■ Reconst

A =9.2×10.2=93.8m²

H(Under the Bridge)=2～2.5m→Ref №20(about half of №20height)

P1	=93.8×13,100Rs/m²	= 1,228,780
P2	=2,944,000×1/2	= 1,472,000
Masonry	=2,195,200×1/2	= 1,097,600
Jetty	=6.0×10.2×44×12.0months×30days	= 969,408
Total		= 4,767,788Rs

SER №35

■ Reconst

A =9.2×22.3=205.2m²

Refer №20

P1	=205.2×13,900Rs/m²	= 2,852,280
P2	=1,507,000+1,437,000+1,344,000	= 4,288,000
Masonry		= 2,195,200
Jetty	=6.0×22.3×44×13.0months×30days	= 2,296,008
Total		= 11,631,488Rs

SER №150

■ Redeck and Widen of Super & Substructure

A =7.0×7.9=55.3m²

P	=55.3×37,600Rs/m²	= 2,079,280Rs

SER No.61

■ Steel Plate for deck(t=20mmplate)

B =4.75m(Overall width)

A =4.75×33.5=159.0m²

W =159.0×0.020×7,850kg/m³=24,963kg

P1 =24,963×31,000Rs/t = 773,853

■ Transportation

P2 =11Rs/tkm×150×25.0t = 41,250

■ Erection of steel plate

Unik 5days

P3 =4,000Rs×5 = 20,000

■ Welding

P4 =1,260Rs/day×2 = 2,520

■ Labour

Foremam =250Rs× 7days
Skilled A =207Rs× 7days
Skilled B =161Rs× 4days
SemiSkilled =137Rs×28days
} = 7,679

■ Total=845,302×1.25 = 1,056,628Rs

SER No.62

■ Reconstructuion(Refter No.211)

A =9.2×24.0=220.8m²

P1 =220.8×119,370Rs/m² = 26,356,896

Jetty=6.0×24.0×44×11.0months×30days = 2,090,880

Total = 28,447,776Rs

SER No.63

■ Reconstruction(Refter No.211)

A =9.2×20.0=184.0m²

P1 =184.0×119,370Rs/m² = 21,964,080

Jetty=6.0×20.0×44×9.0months×30days = 1,425,600

Total = 23,389,680Rs

SER No.68

■ Redeck & Widen of Super & Substructure

A =6.14×46.9=288.0m²

P =288.0×37,600Rs/m² = 10,028,800

SER №128

■ Redeck and Repair of Substructure

A	=3.09×14.67=45.3m²(Refter №20)		
Demolish	=45.3 ×2,887Rs/m²×1.25	=	163,476
Deck	=45.3 ×4,685Rs/m²×1.25	=	265,288
Accesso	=45.3 ×2,746Rs/m²×1.25	=	155,492
Repaint	=250m²×1,120Rs/m²×1.25	=	350,000
Patching	=140kg× 100Rs/m²×1.25	=	17,500
Jetty	=6.0×14.67×44×4.0months×30days	=	464,746
Total		=	1,416,502Rs

SER №208

■ Redeck of Timber

■ Steel Plate for deck

A	=4.12×(8.0+8.3+8.0)=100.1m²		
t	=20mmplate		
W	=100×0.020×7,850kg=15,700kg		
P1	=15.7×31,000Rs/t	=	486,700

■ Transportation

P2	=11Rs/tkm×110km×15.7	=	18,997

■ Erection of steel plate

Unik 4days

P3	=4,000×4	=	16,000

■ Welding

P4	=1,260Rs/days×2	=	2,520

■ Labour

Foremam	=250Rs× 4days	=	4,664
Skilled A	=207Rs× 4days		
Skilled B	=161Rs× 4days		
SemiSkilled	=137Rs×16days		

■ Mat gabion for Scouring

1Pcs = 49,400

Nos =1side×6×2×2=24nos

P6 = = 1,185,600

■T otal

P =1,714,481×1.25 = 2,143,101Rs

SER №119

■ Reconst

Refer №77

A =9.2×10.87=100.0m²

P1 =100.0×13,100Rs/m² = 1,310,000

P2 = = 5,949,000(A1+A2)

Jetty=6.0×10.87×44×12.0months×30days= 1,033,085

Total = 8,292,085Rs

SER №78

■ Redeck and Widen of Super & Substructure

■ Amendment for Substructure

H(Under the Bridge)=9m→(Refter №20 H=5m)

P' =891,695×1.25/100.45m² = 11,096

ΣP' = 37,600

△P =11,096×9/5 = 19,973(○8,877→8,900)

ΣP =37,600+8,900 = 46,500

Total

P =6.0×124.4×46,500 = 34,707,600Rs

SER №80

■ Redeck and Repair of Main Frame

A	=4.24×104.03=441.1m²	
Demolish	=441.1×2,887Rs/m²×1.25	= 1,591,820
Deck	=441.1×4,685Rs/m²×1.25	= 2,583,192
Accesso	=441.1×2,746Rs/m²×1.25	= 1,514,076
Sub Total		= 5,689,088
Repaint	=2,000m²×1,120Rs/m²×1.25	= 2,800,000
Patching	= 700kg× 100Rs/kg×1.25	= 87,500
Jetty	=6.0×104.03×44×10.5months×30days	= 8,651,135
Sub Total		= 11,538,635
Total	=5,689,088+11,538,635	= 17,227,723Rs

SER №34

■ Redeck and Repair of Main Frame

A	=4.33×27.23=117.9m²	
Demolish	=117.9×2,887Rs/m²×1.25	= 425,472
Deck	=117.9×4,685Rs/m²×1.25	= 690,452
Accesso	=117.9×2,746Rs/m²×1.25	= 404,692
Repaint	=250m²×2×1,120Rs/m²×1.25	= 700,000
Patching	=130kg×2× 100Rs/kg×1.25	= 32,500
Jetty	=6.0×27.23×44×5.0months×30days	= 1,078,308
Total		= 3,331,424Rs

SER №40

■ Redeck and Widen of Super & Substructure

A	=7.0×21.0=147.0m²(Refter №20)	
P	=147.0×37,600Rs/m²	= 5,527,200Rs

SER No.42

■ Redeck and Repair of Main Frame

A	=4.29×59.20=254.0m²	
Demolish	=254.0×2,887Rs/m²×1.25	= 916,623
Deck	=254.0×4,685Rs/m²×1.25	= 1,487,488
Accesso	=254.0×2,746Rs/m²×1.25	= 871,855
Repaint	=380m²×3×1,120Rs/m²×1.25	= 1,596,000
Patching	=160kg×3× 100Rs/kg×1.25	= 60,000
Jetty	=6.0×59.2×44×7.0months×30days	= 3,282,048
Total		= 8,214,013Rs

SER No.44

■ Reconst

A	=9.2×31.15=286.6m²	
P1	=286.6×89,800Rs/m²	= 25,736,680
P2	=6.0×31.15×44×17.0months×30days	= 4,194,036
Total		= 29,930,716Rs

SER No.87

■ Repair of Substructure(Grouting for loose stone of abutment)

Class C concrete Vc=2m³

P	=	= 7,130Rs

SER No.178

■ Redeck and Repair of Main Frame

A	=4.60×43.6=200.6m²	
Demolish	=200.6×2,887Rs/m²×1.25	= 723,916
Deck	=200.6×4,685Rs/m²×1.25	= 1,174,764
Accesso	=200.6×2,746Rs/m²×1.25	= 688,560
Repaint	=190m²×4×1,120Rs/m²×1.25	= 1,064,000
Patching	=125kg×4× 100Rs/kg×1.25	= 62,500
Jetty	=6.0×43.6×44×6.5months×30days	= 2,244,528
Total		= 5,958,268Rs

SER №21

■ Redeck and Repair of Main Frame(for Truss)

A	=4.22×26.22=110.6m²		
Demolish	=110.6×2,887Rs/m²×1.25	=	399,128
Deck	=110.6×4,685Rs/m²×1.25	=	647,701
Accesso	=110.6×2,746Rs/m²×1.25	=	379,635
Repaint	=510m²×1,120Rs/m²×1.25	=	714,000
Patching	=175kg× 100Rs/kg×1.25	=	21,875
Jetty	=6.0×26.22×44×7.0months×30days	=	1,453,637
Sub Total		=	3,615,976Rs

■ Redeck(for RSJ/BUC)

A	=4.22×10.5=44.3m²		
AP1	=0.17×4+0.410×2=1.5m		
AP2	=1.5×5nos×10.5=79.0m²		
Demolish	=44.3×2,887Rs/m²×1.25	=	159,868
Deck	=44.3×4,685Rs/m²×1.25	=	259,432
Accesso	=44.3×2,746Rs/m²×1.25	=	152,060
Repaint	=79.0m²×1,120Rs/m²×1.25	=	110,600
Jetty	=6.0×10.5×44×7.0months×30days	=	582,120
Sub Total		=	1,264,080Rs
Total		=	4,880,056Rs

SER №24

■ Redeck and Widen of Super & Substructure

Demolish of Timber

A1	=3.23×13.6=43.9m²	
A2	=5.0 ×13.6=68.0m²	
Wt	=0.150×43.9×0.80t/m³=5.3t	
Ws	=48.3kg/m×2nos×13.6m=1,314kg	

■ Demolish of Timber

Unik 2days

P	=4,000×2=8,000	

■ Labour

Foreman	=250Rs× 1days	=	1,394
Skilled B	=161Rs× 2days		
SemiSkilled	=137Rs× 6days		

■ Main girder =1.3t×92,569Rs/t = 120,340

■ Deck =68.0m²×4,685Rs/m² = 318,580

■ Bearing(400×32)=3.2m×583Rs/m = 1,866

■ Accesso =68.0m²×2,746Rs/m² = 186,728

■ Sub Total P1=636,908×1.25 = 796,135Rs

■ Amendment for Substructure

H(Under the Bridge)=2.5m→(Refter №20 H=5m)

P'	=891,695×1.25/100.45m²	= 11,096
ΣP'		= 37,600
△P	= 11,096×2.5/5.0	= 5,548
ΣP	= 11,096−5,548	= 5,600
P2	=68.0×5,600	= 380,800

■ Total

P =796,135+380,800 = 1,176,935Rs

SER №55

■ Redeck and Widen of Superstructure

B	=4.5m→5.0m(Non Additional Girder)		
A1	=4.5×20.9= 94.1m²		
A2	=5.0×20.9=104.5m²		
AP'	=0.155×4+0.400×2=1.42m		
AP	=1.42×5nos×20.9=148.4m²		
Demolish	= 94.1×2,887Rs/m²×1.25	=	339,583
Deck	=104.5×4,685Rs/m²×1.25	=	611,978
Accesso	=104.5×2,746Rs/m²×1.25	=	358,696
Repaint	=148.4m²×1,120Rs/m²×1.25	=	207,760
Jetty	=6.0×20.9×44×5.0months×30days	=	827,640
Total		=	2,345,659Rs

SER No.56

■ Redeck and Widen of Superstructure

Non Additional Girder

A1	=4.57×10.10=46.2m²		
A2	=5.0 ×10.10=50.5m²		
AP'	=0.155×4+0.400×2=1.42m		
AP	=1.42×10.1×5nos=72.0m²		
Demolish	=46.2×2,887Rs/m²×1.25	=	166,724
Repaint	=72 ×1,120Rs/m²×1.25	=	100,800
Deck	=50.5×4,685Rs/m²×1.25	=	295,741
Accesso	=50.5×2,746Rs/m²×1.25	=	173,341
Jetty	=6.0×10.1×44×4.0months×30days		
		=	319,968
Total		=	1,056,574Rs

SER No.74

■ Redeck and Widen of Superstructure

Non Additional Girder

A	=5.6 ×10.3=57.7m²		
AP'	=0.170×4+0.410×2=1.50m		
AP	=1.50×5nos×10.3=77.3m²		
Demolish	=57.7×2,887Rs/m²×1.25	=	208,225
Repaint	=77.3×1,120Rs/m²×1.25	=	108,220
Deck	=57.7×4,685Rs/m²×1.25	=	337,906
Accesso	=57.7×2,746Rs/m²×1.25	=	198,055
Jetty	=6.0×10.3×44×4.0months×30days		
		=	326,304
Total		=	1,178,710Rs

SER №127

■ Redeck and Widen of Superstructure

A1	=4.25×10.20=43.4m²		
A2	=5.0 ×10.20=51.0m²		
AP'	=0.150×4+0.400×2=1.40m		
AP	=1.40×10.2×5nos=71.4m²		
Demolish	=43.4×2,887Rs/m²×1.25	=	156,620
Repaint	=71 ×1,120Rs/m²×1.25	=	99,400
Deck	=51.0×4,685Rs/m²×1.25	=	298,669
Accessory	=51.0×2,746Rs/m²×1.25	=	175,058
Jetty	=6.0×10.2×44×4.0months×30days		
		=	323,136
Total		=	1,052,883Rs

SER №133

■ Redeck and Widen of Super & Substructure

A1 =5.0×9.0 =45.0m²

■ Amendment for Substructure

H(Under the Bridge)=4.0m→(Refter №20 H=5m)

P'	=891,695×1.25/100.45m²	=	11,096
ΣP'		=	37,600
△P	=11,096×4.0/5.0	=	8,877(△2,200)
ΣP	=37,600−2,200	=	35,400
Total			
P	=45.0×35,400	=	1,593,000Rs

SER №27

■ Reconst

A	=9.8×35.2 =345.0m²		
P1	=345.0×89,800	=	30,981,000
Jetty	=6.0×35.2×44×17.0months×30days	=	4,739,328
Total		=	35,720,328Rs

SER No.66

■ Repair of Main Frame

Repaint	=710m² × 1,120Rs/m² × 1.25	=	994,000
Patching	=300kg × 100Rs/kg × 1.25	=	37,500
Total		=	1,031,500Rs

SER No.70

■ Redeck and Widen of Super & Substructure

A1 =7.5 × 42.5=318.8m²

A2 =(7.5 − 5.93) × 42.5=67m²

AP1' =0.150 × 3 + 0.400 × 2=1.25m

AP1 =(1.25 × 2nos + 1.25 × 5nos) × 42.5

=106.25(New) + 265.63(Exist)m²

WS1 =9.58kg/m × 42.5m × 2nos=4,072kg(Main beam)

WS2 =95.8kg/m × (2.0m × 8 + 1.4m × 16)=3,679kg(Sub)

AP2' =0.150 × 4 + 0.400 × 2=1.40m

AP2 =1.40 × (2.0 × 8 + 1.4 × 16)=53.8m²

ΣWS =4,072 + 3,679=7,751kg

Transportation(20km)

Steel Member

	:P1 =7.751 × 31,000RS/t	=	240,281

Transportation

	:P2 =20km × 5nos × 33Rs/km•nos	=	3,300

Erection(Unik:2days)

	:P3 =4,000 × 2	=	8,000
Paint	:AP1=(106.3 + 53.8) × 1,120Rs/m²	=	179,312
	AP2=265.6 × 1,040Rs/m²	=	276,224

Deck	:P7 = 67.0 × 4,685Rs/m²	=	313,895
Accessory	:P8 =318.0 × 2,746Rs/m²	=	875,425
Sub Total	:1,899,352 × 1.25	=	2,374,190
Jetty	:6.0 × 42.5 × 44 × 9.0months × 30days	=	3,029,400
Bearing(400 × 32 …… 583Rs/m³)			
	:P6 =0.4 × 20nos × 583	=	2,915
Repair of Substructure(Vc=1m³)		=	3,565

■ Total :P = = 5,407,155Rs

SER №75

■ Redeck and Repair of Main Frame

A	=5.68×40.5=230.0m²		
Demolish	=230.0×2,887Rs/m²×1.25	=	830,013
Deck	=230.0×4,685Rs/m²×1.25	=	1,346,938
Accessory	=230.0×2,746Rs/m²×1.25	=	789,475
Repaint	=800m²×1,120Rs/m²×1.25	=	1,120,000
Patching	=225kg× 100Rs/kg×1.25	=	28,125
Jetty	=6.0×40.5×44×6.5months×30days	=	2,084,940
Total		=	6,199,491Rs

SER №108

■ Redeck and Widen of Super & Substructure

A =7.5×5.7=42.8m²

■ Amendment for Substructure

H(Under the Bridge)=3.0m→(Refter №20)

P'	=891,695×1.25/100.45m²	=	11,096
ΣP'		=	37,600
△P	=11,096×3.0/5.0	=	6,658(△4,400)
ΣP	=37,600−4,400	=	33,200
Total			
P	=42.8×33,200	=	1,420,960Rs

SER №120

■ Repair of Superstructure

P1	=622,995×1.25	=	778,744
Jetty	=6.0×8.5×44×2.0months×30days	=	148,104
Total		=	926,848Rs

SER №197

■ Repair of Main Frame

Repaint	=500m²×2×1,120Rs/m²×1.25	=	1,400,000
Patching	=175kg×2× 100Rs/kg×1.25	=	43,750
Total		=	1,443,750Rs

SER №17

■ Redeck and Widen of Super & Subatructure

A =5.0×10.35=51.8m²

■ Amendment for Substructure

H(Under the Bridge)=4.0m→(Refter №20)

P'	=891,695×1.25/100.45m²	=	11,096
ΣP'		=	37,600
△P	=11,096×4.0/5.0	=	8,877(△2,200)
ΣP	=37,600−2,200	=	35,400
P	=51.8×35,400	=	1,833,720Rs

SER №47

■ Widen of Arch and Repair of Subatructure

A =7.5×14.57=109.3m²

Vc1 =0.5×0.8×20.0=8m³(Demolish of curb)

Vc2 $=\{14.6\times7.0-(1/2\times\frac{\pi\times10^2}{4}+10.0\times1.0\}\times1.20$

=63.5m³(Widen of arch)

Vc3 =0.80×18.0m²×2=28.8m³(Wing wall)

■ Demolish of curb

16man•day=	137Rs/day×16	=	2,192
Generator=3,300Rs/day×8		=	26,400

■ Concrete for arch

P =63.5m³×22,410Rs/m³ = 1,423,035(Refter №20 Deck)

■ Accessory

P =109.3×2,746Rs/m² = 300,138

■ Concrerte for wing wall

P =28.8×10,000Rs/m³ = 288,000

■ Sub Total

P =2,039,765×1.25 = 2,549,706

■ Jetty

=6.0×14.6×44×4.0months×30days = 462,528

■Total

P = = 3,012,234Rs

SER №93

■ Repair of Main Frame

Repaint	=900m²×2×1,120Rs/m²×1.25	=	2,744,000
Patching	=255kg×2× 100Rs/kg×1.25	=	63,750
Total		=	2,807,750Rs

SER №102

■ Redeck and Widen of Superstructure

A	=7.5×17.20=129.0m²		
P	=129.0×12,142Rs/m²×1.25	=	1,957,898
Jetty	=6.0×17.2×44×11.0months×30days	=	1,498,464
Total		=	3,456,362Rs

SER №123

■ Widen of Super & Substructure

Ac =0.131m²/each×5nos×12.02=7.9m³(RC-Beam)

A =7.0×12.02=84.1m²

■ Amendment for Substructure

H(Under the Bridge)=6.0m→(Refter №20)

P'	=891,695×1.25/100.45m²	=	11,096
ΣP'		=	37,600
△P	=11,096×6.0/5.0	=	13,315

■ Addutuonal Main Beam

P =7.9×22,410Rs/m³×1.25 = 221,299

■ Substructure

P =84.1×13,315Rs/m³ = 1,119,792

■ Accessory

P =84.1× 2,746 ×1.25 = 288,673

■ Jetty=6.0×12.0×44×1.0months×30days = 95,040

■ Total= = 1,724,804Rs

SER №151

■ Redeck and Widen of Super & Substructure

A =7.5×10.1=75.8m²

■ Amendment for Substructure

H(Under the Bridge)=4.0m→(Refter №20)

P'	=891,695×1.25/100.45m²	=	11,096
ΣP'		=	37,600
△P	=11,096×4.0/5.0	=	8,877(△2,200)
ΣP	=37,600−2,200	=	35,400
P	=75.8×35,400	=	2,683,320Rs

SER №154

■ Redeck and Widen of Superstructure

A	=5.0 ×10.35=51.8m²		
AP'	=0.150×4+0.400×2=1.4m		
AP	=1.4×5nos×10.35=72.5m²		
Redeck	=51.8m²×9,276Rs/m²×1.25	=	600,621
Repaint	=72.5m²×1,120Rs/m²×1.25	=	101,500
Jetty	=6.0×10.35×44×4.0months×30days		
		=	327,888
Total		=	1,030,000Rs

SER №65

■ Redeck and Widen of Super & Substructure

A =7.5×9.7=72.8m²

H(Under the Bridge)=4.0m→(Refter №151)

P	=72.8×35,400	=	2,577,120Rs

SER №77

■ Reconstruction

P		=121,238,800Rs

SER №89

■ Redeck and Widen of Super & Substructure

A =7.5×4.8=36.0m²

H(Under the Bridge)=5.0m→(Refter №20)

P =36.0×37,600 = 1,353,600Rs

SER №147

■ Redeck and Widen of Super & Substructure

A =7.0×9.84=68.9m²

■ Amendment for Substructure

H(Under the Bridge)=2.5m→(Refter №20)

P' =891,695×1.25/100.45m² = 11,096

ΣP' = 37,600

△P =11,096×2.5/5.0 = 5,548(△5,500)

ΣP =37,600−5,500 = 32,100

P =68.9×32,100 = 2,211,690Rs

SER №148

■ Reconstruction

A =9.2×8.40=77.3m²

■ Amendment for Substructure

H(Under the Bridge)=3.5m abut 70% of height of SER №20

P1 =77.3×12,600Rs/m² = 973,980

P2 =(1,507,000+1,437,000)×0.7 = 2,060,800

Masonry = 2,195,200

Jetty =6.0×8.4×44×7.0months×30days

= 465,696

Total = 5,695,676Rs

SER №173

■ Redeck and Widen of Super & Substructure

A =7.0×6.80=47.6m²

■ Amendment for Substructure

H(Under the Bridge)=2.0m→(Refter №20)

P'	=891,695×1.25/100.45m²	=	11,096
ΣP'		=	37,600
△P	=11,096×2.5/5.0	=	4,438(△6,700)
ΣP	=37,600−6,700	=	30,900
P	=47.6×30,900	=	1,470,840Rs

SER №209

■ Redeck

A1	=2.6 ×4.40 =11.4m²		
A2	=7.26×4.40 =31.9m²		
AP'	=0.155×4+0.340×2=1.30m		
AP	=1.30×4.4×4nos=23.0m²		
Demolish	=11.4×2,887Rs/m²×1.25	=	41,140
Repaint	=23.0×1,120Rs/m²×1.25	=	32,200
Deck	=11.4×4,685Rs/m²×1.25	=	66,761
Accessory	=31.9×2,746Rs/m²×1.25	=	109,497
Jetty	=6.0×4.4 ×44×3.5months×30days		
		=	121,968
Total		=	371;566Rs

SER №19

■ Repair of Main Frame

Repaint	=640m²×1,120Rs/m²×1.25	=	896,000
Patching	=195kg× 100Rs/kg×1.25	=	24,375
Total		=	920,375Rs

SER №26

■ Redeck and Repair of Main Frame

A	=4.26×19.0=80.9m²		
Demolish	=80.9×2,887Rs/m²×1.25	=	291,948
Deck	=80.9×4,685Rs/m²×1.25	=	473,771
Accessory	=80.9×2,746Rs/m²×1.25	=	277,689
Repaint	=370m²×1,120Rs/m²×1.25	=	518,000
Patching	=155kg× 100Rs/kg×1.25	=	19,375
Jetty	=6.0×19.0×44×4.5months×30days		
		=	677,160
Total		=	2,257,943Rs

SER №30

■ Redeck and Repair of Substructure

A1	=5.6 ×20.7 =115.9m²		
A2	=7.0 ×20.7 =144.9m²		
AP'	=0.190×4+0.610×2=1.98m		
AP	=1.98×20.7×5nos=204.9m²		
Demolish	=115.9×2,887Rs/m²×1.25	=	418,254
Deck	=144.9×4,685Rs/m²×1.25	=	848,571
Accessory	=144.9×2,746Rs/m²×1.25	=	497,369
Repaint	=204.9×1,120Rs/m²×1.25	=	286,860
Repaire of Sub			
	=3m³ ×3,565Rs/m³	=	10,695
Jetty	=6.0×20.7×44×5.0months×30days		
		=	819,720
Total		=	2,881,469Rs

SER №39

■ Redeck and Widen of Super & Substructure

A	=7.0×23.1=161.7m²		
AP'	=0.150×4+0.480×2=1.56m		
AP	=1.56×2.5×2=7.8m²		
Vc	$=\frac{\pi \times d^2}{4}\times 8.9=15.1m^3$(Additional Caison)		
Ws	=95.8kg/m×2.5m×2nos=479kg(H-400)		
P1	=161.7×12,142Rs/m²	=	1,963,361
P2	=0.479×31,000Rs/t	=	14,849(Sub)

■ Transportation

P3 =1nos × 150km × 33Rs/km・nos = 4,950

■ Erection(Unik 2days)

P4 =4,000Rs × 2 = 8,000

■ Painting

P5 =1.56 × 1,040 = 8,112

■ Sub Total

P6 =1,999,272 × 1.25 = 2,499,090

■ Substructure

P7 =15.1 × 11,400Rs/m³ = 172,140

■ Jetty

P8 =6.0 × 23.1 × 44 × 8.0months × 30days = 1,463,616

■ Total

P = 4,134,846Rs

SER №57

■ Redeck and Widen of Super & Substructure

A =6.0 × 9.2 =55.2m²

H(Under the Bridge)=4.0m→(Refter №151)

P =55.2 × 35,400 = 1,954,080Rs

SER №131

■ Reconstruction

A =7.0 × 4.73 =33.1m²

Reconst of RC beam : = 70,000

P1 =33.1 × 70,000 = 2,317,000

Jetty=6.0 × 4.7 × 44 × 4.0months × 30days

= 148,896

Total = 2,465,896Rs

SER No.135

■ Redeck and Widen of Superstructure

A1 =4.6 ×9.30 =42.8m²

A2 =5.0 ×9.30 =46.5m²

Nor Additional Main girder

AP' =0.150×4+0.400×2=1.4m

AP =1.4×9.30×5nos=65.1m²

Demolish	=42.8×2,887Rs/m²×1.25	=	154,455
Repaint	=65.1×1,120Rs/m²×1.25	=	91,140
Deck	=46.5×4,685Rs/m²×1.25	=	272,316
Accessory	=46.5×2,746Rs/m²×1.25	=	294,611
Jetty	=6.0×20.7×44×5.0months×30days	=	294,624
Total		=	972,147Rs

SER No.136

■ Widen of Super & Substructure

△A =(7.0×4.28)×30.5=83.0m²

■ Caisson

$$Vc = \frac{\pi \times d^2}{4} \times 5.0 \times 2 \times 4 = 45.2m^3 (d=1.2m)$$

■ Steel Member

Ws1 =65.5kg/m×2nos×30.5m=3,996kg→4.0t
(H-150×300)

Ws2 =38.3kg/m×(1.5m×2)×8nos×44.1kg/m×3.5m×2×4=2,154kg→2.2t
(H-125×250) (H-175×250)

P1	=83.0m²×4,685Rs/m²×1.25	=	486,069
P2	=(4.0+2.2)×92,569Rs/t×1.25	=	717,410
Bearing	=8.0m×583Rs/m×1.25 (400×32;20nos×0.4)	=	5,830
Accessory	=83.0×2,746Rs/m²×1.25	=	284,898
P3	=45.2m³×11,400Rs/³	=	515,280
Jetty	=6.0×30.5×44×7.5months×30days	=	1,811,700
Total	=	=	3,821,187Rs

SER №25

■ Reconst

A =5.0×24.2=121.0㎡ (Refter №20)

P =121.0×117,000 = 14,157,000Rs

SER №41

■ Repair of Handrails

P = = 1,000,000Rs

SER №67

■ Redeck and Widen of Super & Substructure

A	=5.0 ×19.0 =95.5m² (Refter №59 Abutment: W=9.2m, P=6,988,000Rs)		
△W	=5.0−3.34=1.7m		
P'	=1.7/9.2×6,988,000	=	1,291,262
Redeck	=95.5×12,142Rs/m²×1.25	=	1,449,451
Substructre		=	2,582,522
Jetty	=6.0×19.1 ×44×8.0months×30days		
		=	1,210,176
Total		=	5,242,149Rs

SER №69

■ Repair of Main Frame

Repaint	=230m²×1,120Rs/m²×1.25	=	322,000
Patching	=130kg× 100Rs/kg×1.25	=	16,250
Total		=	338,250Rs

SER №76

■ Repair of Main Frame

Repaint	=900m²×2×1,120Rs/m²×1.25	=	2,520,000
Patching	=250kg×2× 100Rs/kg×1.25	=	62,550
Total		=	2,582,500Rs

SER №79

■ Repair of Main Frame

Repaint	=450m²×3×1,120Rs/m²×1.25	=	1,890,000
Patching	=170kg×3× 100Rs/kg×1.25	=	63,750
Total		=	1,953,750Rs

SER №84

■ Redeck

A	=5.5×68.3=375.7m² (Refter №20)		
P'	=1,219,654−287,890−7,456	=	924,308
P	=924,308×1/100.45m²	=	9,202
α	=1.5(extra coefficient considering height)		
P	=375.7×(9,202×1.5)×1.25	=	6,482,234Rs

SER No.85

■ Widen of Super & Substruture for Footways

A = 1.2m × 2 × 16.23 × 4 = 155.8m²

Vc1 = 2.61 × 1.20 × 8.00m × 2sides × 3

= 150.3m³(Substructure)

Vc2 = 0.6 × 1.2 × 68.9m × 2sides

= 99.2m³(Curb, Handrail)

■ Demolish of Curb, Handrail

Labour

Foremam	=250Rs ×	5days	
Skilled A	=207Rs ×	5days	= 82,945
SemiSkilled	=161Rs ×	50days	
Un Skilled	=137Rs ×	530days	

Generator

3,300Rs/day × 53days = 174,900

Unik

4,000Rs/day × 10days = 40,000

Sub Total

Pl =297,845 × 1.25 = 372,306

■ Super = 155.8m² × 16,400Rs/m² = 2,555,120

■ Sub = 150.3m³ × 11,400Rs/m³ = 1,713,420

■ Accessory

= 1.80 × 68.90m × 2 × 2.746Rs/m² × 1.25 = 851,397

■ Total = = 5,492,243Rs

SER No.99

■ Redeck and Repair of Main Frame

A =6.7×124.8=836.2m²

Demolish =836.2×2,887Rs/m²×1.25 = 3,017,637

Deck =836.2×4,685Rs/m²×1.5×1.25 = 7,345,494
(α)

Accessory=836.2×2,746Rs/m²×1.25 = 2,870,257

Repaint =390m²×6×1,120Rs/m²×1.25 = 3,276,000

Patching =160kg×6× 100Rs/kg×1.25 = 120,000

Total = 16,629,388Rs

SER No.195

■ Redecck and Widen of Super & Substructure

A =7.5×5.5 =41.3m²

H(Under the Bridge)=4.0m→(Refter No.151)

P =41.3 ×35,400 = 1,462,020Rs

SER No.201

■ Repair of Substructure

Grouting for wing wall Rs= 7,000Rs

SER No.36

■ Reconst

A =9.8×31.12=305.0m²

P1 =305.0×89,800Rs/m² = 27,389,000

Jetty=6.0×31.12×44×17.0months×30days = 4,189,997

Total= = 31,578,997Rs

SER No.138

■ Redeck and Widen of Super & Substructure

A =7.0×10.3=72.1m² (Refter No.20)

P =72.1×37,600Rs/m² = 2,710,960Rs

SER №211

■ Redeck and Widen of Super & Substructure

A1 =7.0×23.6=165.2m²

A2 =(7.0−3.83)×23.6=74.8m²

Ws =176kg/m×23.6×3nos=12,461kg
(H-600×230)

■ Substructure

△B =7.0−3.83=3.2m (Refter Reconst Plan of №211)

P	=14,171,000×3.2/9.8m	= 4,627,265
Main Beam	=12,461t×92,569Rs/t ×1.25	= 1,441,878
Deck	= 74.8m²× 4,685Rs/m²×1.25	= 438,408
Accessory	= 74.8m²× 2,746Rs/m²×1.25	= 256,751
Sub		= 4,627,265
Masonry		= 1,754,200
Mat gabion		= 7,410,000
Jetty	=6.0×23.6×44×8.0months×30days	= 1,495,296
Total		= 17,423,798Rs

SER №210

■ Redeck and Widen of Super & Substructure

△A =(7.0−4.20)×23.7=66.4m²

Ws =176kg/m×23.7m×3nos=12,514kg
(H-600×230)

Main Beam	=12,514t×92,569Rs/t ×1.25	= 1,448,011
Deck	= 66.4m²× 4,685Rs/m²×1.25	= 388,855
Accessory	= 66.4m²× 2,746Rs/m²×1.25	= 227,918
Sub	=14,171,000×2.8/9.8m (Refter Reconst Plan of №211)	= 4,048,857
Jetty	=6.0×23.7×44×8.0months×30days	= 1,501,632
Total		= 7,615,273Rs

SER №2

■ Redeck and Widen of Super & Substructure

A =7.5×122.6=919.5m²

■ Substructure

(Refter Reconst Plan of №77)

P	=30,927,000×2.0×9.8m	= 6,311,633
Redeck	=919.5×12,142Rs/m²×1.25	= 13,955,711
Sub		= 6,311,633
Jetty	=6.0×122.6×44×16.0months×30days	= 15,535,872
Total		= 35,803,216Rs

SER №43

■ Repair of Substructure

P = = 1,000,000Rs

SER №45

■ Repair of Substructure

P = = 1,000,000Rs

SER №58

■ Reconst

A =5.0×10.35=51.8m²

Sub,Super : PSC/PRE 11.6m(13,900Rs/m²)

Refter Reconst Plan of №59

P1	=51.8×13,900Rs/m²	= 720,020
P2	=	= 6,988,000(A1)
P3	=	= 6,652,000(A2)
Masonry		= 1,097,600
Mat gabion		= 7,410,000
Jetty	=6.0×10.35×44×14.0months×30days	= 1,147,608
Total		= 24,015,228Rs

SER №59

■ Redeck and Widen of Super & Substructure

A =5.0×51.0=255.0m²

■ Substructure

Cross beam =48.3kg/m×2.0m×8nos = 773kg
(H-200×125)

Pier =95.8kg/m×2.0m×4nos×2=1,533kg
(H-400×150)

Brance =48.3kg/m×3.0m×8nos =1,159kg

Sub Total :P1 =3.465t×31,000Rs/t×1.25 = 134,269

Transportation
:P2 =33Rs/km·nos×75km×8nos×1.25
= 24,750

Erection(Unik 4days)
:P3 =4,000×4×1.25 = 20,000

Cylinder :

$$Vc = \frac{\pi \times 0.75^2}{4} \times 12.0m \times 4nos = 21.2m^3$$

P4 =21.2×11,400Rs/m³ = 241,680

Paint :P5 =65.0m²×1,040Rs/m²×1.25 = 84,500

Sub Total :P6 = = 505,199

■ Redeck :P7 =255.0×12,142Rs/m²×1.25 = 3,870,263

■ Jetty :P8 =6.0×51.0×44×8.0months×30days
= 3,231,360

■ Total :P = = 7,606,822Rs

SER №130

■ Repair of Main Frame

Repaint =470m²×1,120Rs/m²×1.25 = 658,000

Patching =170kg× 100Rs/kg×1.25 = 21,250

Total = 679,250Rs

SER No.53

■ Repair of Main Frame

Repaint =800m² × 1,120Rs/m² × 1.25 = 1,120,000

Patching =225kg × 100Rs/kg × 1.25 = 28,125

Total = 1,148,125Rs

SER No.60

■ Reconst

Refter No.20

P = = 19,364,600Rs

SER No.46

■ Widen

$$Ac = 11.7 \times (7.5 + 0.8)\left(\frac{\pi \times 6.0^2}{4} \times \frac{1}{2} + 4.5 \times 6.0\right)$$

$$= 56.0m^2$$

$Vc = 56.0 \times 1.7 = 95.2m^3$

P =95.2 × 11,400Rs/m³ = 1,085,280Rs

SER No.106

■ Redeck and Widen of Super & Substructure

A =(7.5 − 4.7) × 16.3 = 45.6m²

Main Beam:

Ws =95.8kg/m × 16.3m × 2nos = 3,123kg
(H-400×150)

Main Beam =3,123 × 92,569Rs/t × 1.25 = 361,366

Deck =45.6 × 4,685Rs/m² × 1.25 = 267,045

Accessory =45.6 × 2,746Rs/m² × 1.25 = 156,522

Total = 784,933Rs

SER No.73

■ Repair of Substructure

Grouting with cement

P =3,565Rs/nos × 2 = 7,000Rs