

**Democratic Socialist Republic of Sri Lanka
Sri Lanka Land Development Corporation**

**THE PROJECT FOR STORM WATER
DRAINAGE PLAN
IN SELECTED AREAS
IN COLOMBO METROPOLITAN REGION**

FINAL REPORT

Volume 2 Appendix

February 2023

JAPAN INTERNATIONAL COOPERATION AGENCY

CTI ENGINEERING INTERNATIONAL CO., LTD.

NIPPON KOEI CO., LTD.

EARTH SYSTEM SCIENCE CO., LTD.

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**CURRENCY EXCHANGE RATES USED IN THE
REPORT:**

US\$ 1.00 = LKR. 181.06 = JpY. 109.12
LKR 1.00 = JpY. 0.603
AS of 31 December 2022^{*1}

*1: Since price fluctuations caused by the recent economic crisis in exchange rates and price increases in recent years regarding the Sri Lankan Rupee are not taken into account. Specifically, the exchange rate was set based on the average value from November 11, 2019 to February 10, 2020, and price increases after this period were not considered.

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Appendix-1
Cost Estimate

Table 1 Construction Cost for the Kalu Oya and Mudun Ela Basin Improvement (1/2) (M/P)

Kalu Oya

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	60,147,602	149,030,606	209,178,208
Earth work	199,938,060	163,504,427	363,442,487
Sheet Pile Work	436,589,720	2,063,680,040	2,500,269,760
Gabion Wall	281,980,484	79,344,200	361,324,684
Parapet Wall	19,136,628	9,808,648	28,945,276
U-Ditch	40,785,604	15,158,939	55,944,543
Other Concrete Work	34,945,216	19,560,874	54,506,090
Foot Protection with Riprap	22,575,500	0	22,575,500
Road Work	13,364,032	15,007,797	28,371,829
Bridge Works	153,636,799	614,547,190	768,183,989
Others	120,295,204	298,061,212	418,356,416
Total	1,383,394,849	3,427,703,933	4,811,098,782

Natha Canal

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	5,695,133	2,006,145	7,701,278
Earth work	18,644,587	11,078,422	29,723,009
Sheet Pile Work	0	0	0
Gabion Wall	83,467,568	21,100,291	104,567,859
Parapet Wall	0	0	0
U-Ditch	3,571,856	1,327,565	4,899,421
Other Concrete Work	5,328,527	2,982,687	8,311,214
Foot Protection with Riprap	0	0	0
Road Work	2,890,116	3,633,930	6,524,046
Bridge Works	0	0	0
Others	11,390,265	4,012,290	15,402,555
Total	130,988,052	46,141,330	177,129,382

Old Dutch Canal with Diversion

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	45,191,695	91,394,488	136,586,183
Earth work	240,785,086	215,029,500	455,814,586
Sheet Pile Work	266,057,760	1,251,764,160	1,517,821,920
Gabion Wall	205,737,356	46,044,798	251,782,154
Parapet Wall	12,945,366	6,635,263	19,580,629
U-Ditch	43,277,597	16,085,148	59,362,745
Other Concrete Work	17,348,690	9,711,073	27,059,763
Foot Protection with Riprap	14,334,750	0	14,334,750
Stone Masonry Work	16,999,916	13,335,408	30,335,324
Road Work	27,498,199	33,887,684	61,385,883
Bridge Works	58,849,183	235,396,731	294,245,914
Others	90,383,390	182,788,977	273,172,367
Total	1,039,408,988	2,102,073,230	3,141,482,218

Mudun Ela (downstream, 10yr)

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	25,607,654	28,218,151	53,825,805
Earth work	89,475,274	58,444,748	147,920,022
Sheet Pile Work	40,415,700	184,854,540	225,270,240
Gabion Wall	262,915,673	99,191,992	362,107,665
Parapet Wall	2,435,752	1,243,259	3,679,011
U-Ditch	24,089,258	8,953,345	33,042,603
Other Concrete Work	31,103,720	17,410,565	48,514,285
Foot Protection with Riprap	0	0	0
Road Work	19,173,525	24,087,820	43,261,345
Bridge Works	37,173,816	148,695,263	185,869,079
Gate works	5,370,370	21,481,481	26,851,851
Others	51,215,309	56,436,301	107,651,610
Total	588,976,051	649,017,465	1,237,993,516

Mudun Ela (upstream, 25yr)

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	16,325,138	18,279,343	34,604,481
Earth work	139,408,793	159,542,882	298,951,675
Gabion Wall	9,526,301	1,862,693	11,388,994
U-Ditch	83,584,916	28,959,792	112,544,708
Road Work	53,993,030	15,262,613	69,255,643
Bridge Works	30,323,053	121,292,210	151,615,263
Gate works	9,666,667	38,666,667	48,333,334
Others	32,650,276	36,558,686	69,208,962
Total	375,478,174	420,424,886	795,903,060

Peliyagoda

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	660,240	2,040,179	2,700,419
Earth works	1,735,776	4,063,920	5,799,696
Pump Station Improvement	7,172,720	19,554,480	26,727,200
Gate works	4,296,296	17,185,185	21,481,481
Others	1,320,479	4,080,359	5,400,838
Total	15,185,511	46,924,123	62,109,634

Retarding basin at 5 marsh areas

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	122,144,847	202,080,447	324,225,294
Earth work	1,907,585,825	3,815,681,516	5,723,267,341
U-Ditch	414,668,800	207,332,976	622,001,776
Road Work	117,312,680	5,275,920	122,588,600
Gate works	3,329,630	13,318,519	16,648,149
Others	244,289,694	404,160,893	648,450,587
Total	2,809,331,476	4,647,850,271	7,457,181,747

Source: JICA Study Team

Table 2 Construction Cost for the Kalu Oya and Mudun Ela Basin Improvement (2/2) (M/P)

Mudun Ela+Peiyagoda (10yr)

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	26,267,894	30,258,330	56,526,224
Earth work	91,211,050	62,508,668	153,719,718
Sheet Pile Work	40,415,700	184,854,540	225,270,240
Gabion Wall	262,915,673	99,191,992	362,107,665
Parapet Wall	2,435,752	1,243,259	3,679,011
U-Ditch	24,089,258	8,953,345	33,042,603
Other Concrete Work	31,103,720	17,410,565	48,514,285
Road Work	19,173,525	24,087,820	43,261,345
Bridge Works	37,173,816	148,695,263	185,869,079
Gate Works	9,666,666	38,666,666	48,333,332
Pump Station Improvement	7,172,720	19,554,480	26,727,200
Others	52,535,788	60,516,660	113,052,448
Total	604,161,562	695,941,588	1,300,103,150

Source: JICA Study Team

Tanks (Ihalagama (813m), Kapuwa Wewa (1,839m), Ragama (1,302m))

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	728,356	589,767	1,318,123
Earth work	12,418,962	3,202,740	15,621,702
Gate works	2,148,148	8,592,593	10,740,741
Others	1,456,711	1,179,533	2,636,244
Total	16,752,177	13,564,633	30,316,810

Table 3 Detailed Construction Cost for the Kalu Oya and Mudun Ela Basin Improvement (1/10) (M/P)

Kalu Oya (1)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	5.02	1,720	8634.4	43	0	371,280	0
Dredging	m3	9.36	1,720	16099.2	126	295	2,028,500	4,749,264
Excavation	m3	24.15	1,720	41538	694	373	28,827,372	15,493,674
Backfill	m3	1.11	1,720	1909.2	1,783	563	3,404,104	1,074,880
Disposal of soil (Kalu Oya)	m3	32.23	1,720	55435.6	187	437	10,366,458	24,225,358
Embankment	m3	0.17	1,720	292.4	641	640	187,429	187,136
Supply and Installation of SSP	m2	18.00	1,720	30960	7,219	37,901	223,500,240	1,173,414,960
Coping Concrete (incl. formwork)	m	2.00	1,720	3440	8,501	9,587	29,243,440	32,979,280
Concrete for Parapet Wall	m3	0.23	1,720	395.6	6,460	13,728	2,555,576	5,430,797
Formwork for Parapet Wall	m2	2.00	1,720	3440	2,384	24	8,200,960	82,560
Concrete for U-ditch	m3	0.22	1,720	378.4	6,460	13,728	2,444,464	5,194,676
Formwork for U-ditch	m2	2.80	1,720	4816	2,384	24	11,481,344	115,584
Gravel Bedding for U-ditch	m3	0.06	1,720	103.2	3,504	0	361,613	0
Concrete for Wall	m3	0.25	1,720	430	6,460	13,728	2,777,800	5,903,040
Formwork for Wall	m2	1.51	1,720	2597.2	2,384	24	6,191,725	62,333
Gravel Bedding for Wall	m3	0.28	1,720	481.6	3,504	0	1,687,527	0
Compacted Pavement	m3	0.14	1,720	240.8	3,621	494	871,937	118,956
Riprap	m3	1.25	1,720	2150	5,540	0	11,911,000	0

Kalu Oya (2)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	4.88	780	3806.4	43	0	163,676	0
Dredging	m3	17.06	780	13306.8	126	295	1,676,657	3,925,506
Excavation	m3	13.20	780	10296	694	373	7,145,424	3,840,408
Backfill	m3	1.21	780	943.8	1,783	563	1,682,796	531,360
Disposal of soil (Kalu Oya)	m3	17.05	780	13299	187	437	2,486,913	5,811,663
Supply and Installation of SSP	m2	12.00	780	9360	7,219	37,901	67,569,840	354,753,360
Coping Concrete (incl. formwork)	m	2.00	780	1560	8,501	9,587	13,261,560	14,955,720
Concrete for Parapet Wall	m3	0.23	780	179.4	6,460	13,728	1,158,924	2,462,804
Formwork for Parapet Wall	m2	2.00	780	1560	2,384	24	3,719,040	37,440
Concrete for U-ditch	m3	0.22	780	171.6	6,460	13,728	1,108,536	2,355,725
Formwork for U-ditch	m2	2.80	780	2184	2,384	24	5,206,656	52,416
Gravel Bedding for U-ditch	m3	0.06	780	46.8	3,504	0	163,988	0
Compacted Pavement	m3	0.14	780	109.2	3,621	494	395,414	53,945
Riprap	m3	1.25	780	975	5,540	0	5,401,500	0

Kalu Oya (3)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	11.67	100	1167	43	0	50,181	0
Dredging	m3	21.30	100	2130	126	295	268,380	628,350
Excavation	m3	32.98	100	3298	694	373	2,288,812	1,230,154
Backfill	m3	11.98	100	1198	1,783	563	2,136,034	674,474
Disposal of soil (Kalu Oya)	m3	34.48	100	3448	187	437	644,776	1,506,776
Embankment	m3	7.82	100	782	641	640	501,262	500,480
Gabion with Rock	m3	17.00	100	1700	9,651	1,838	16,406,700	3,124,600
Filter Cloths	m2	14.50	100	1450	468	0	678,600	0
Gabion Foundation Rock	m3	3.06	100	306	5,097	1,522	1,559,682	465,732
Concrete for Top	m3	1.23	100	123	6,460	13,728	794,580	1,688,544
Formwork for Top	m2	2.92	100	292	2,384	24	696,128	7,008
Dowel Bar	m	1.60	100	160	498	408	79,680	65,280
Turf	m2	4.02	100	402	583	0	234,366	0
Concrete for U-ditch	m3	0.22	100	22	6,460	13,728	142,120	302,016
Formwork for U-ditch	m2	2.80	100	280	2,384	24	667,520	6,720
Gravel Bedding for U-ditch	m3	0.06	100	6	3,504	0	21,024	0
Concrete for Wall	m3	0.50	100	50	6,460	13,728	323,000	686,400
Formwork for Wall	m2	3.02	100	302	2,384	24	719,968	7,248
Gravel Bedding for Wall	m3	0.56	100	56	3,504	0	196,224	0
Concrete Pavement	m3	0.60	100	60	6,460	13,728	387,600	823,680
Base Course	m3	0.60	100	60	4,742	357	284,520	21,420

Source: JICA Study Team

Table 4 Detailed Construction Cost for the Kalu Oya and Mudun Ela Basin Improvement (2/10) (M/P)

Kalu Oya (4)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	19.40	1,300	25220	43	0	1,084,460	0
Dredging	m3	20.78	1,300	27014	126	295	3,403,764	7,969,130
Excavation	m3	50.65	1,300	65845	694	373	45,696,430	24,560,185
Backfill	m3	20.36	1,300	26468	1,783	563	47,192,444	14,901,484
Disposal of soil (Kalu Oya)	m3	48.47	1,300	63011	187	437	11,783,057	27,535,807
Embankment	m3	2.60	1,300	3380	641	640	2,166,580	2,163,200
Gabion with Rock	m3	17.00	1,300	22100	9,651	1,838	213,287,100	40,619,800
Filter Cloths	m2	14.85	1,300	19305	468	0	9,034,740	0
Gabion Foundation Rock	m3	3.06	1,300	3978	5,097	1,522	20,275,866	6,054,516
Concrete for Top	m3	1.48	1,300	1924	6,460	13,728	12,429,040	26,412,672
Formwork for Top	m2	1.84	1,300	2392	2,384	24	5,702,528	57,408
Dowel Bar	m	1.60	1,300	2080	498	408	1,035,840	848,640
Turf	m2	1.78	1,300	2314	583	0	1,349,062	0
Concrete for U-ditch	m3	0.22	1,300	286	6,460	13,728	1,847,560	3,926,208
Formwork for U-ditch	m2	2.80	1,300	3640	2,384	24	8,677,760	87,360
Gravel Bedding for U-ditch	m3	0.06	1,300	78	3,504	0	273,312	0
Concrete for Wall	m3	0.50	1,300	650	6,460	13,728	4,199,000	8,923,200
Formwork for Wall	m2	3.02	1,300	3926	2,384	24	9,359,584	94,224
Gravel Bedding for Wall	m3	0.56	1,300	728	3,504	0	2,550,912	0
Concrete Pavement	m3	0.60	1,300	780	6,460	13,728	5,038,800	10,707,840
Base Course	m3	0.60	1,300	780	4,742	357	3,698,760	278,460

Kalu Oya (5)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	16.91	100	1691	43	0	72,713	0
Dredging	m3	24.42	100	2442	126	295	307,692	720,390
Excavation	m3	37.98	100	3798	694	373	2,635,812	1,416,654
Backfill	m3	1.29	100	129	1,783	563	230,007	72,627
Disposal of soil (Kalu Oya)	m3	59.91	100	5991	187	437	1,120,317	2,618,067
Embankment	m3	1.20	100	120	641	640	76,920	76,800
Supply and Installation of SSP	m2	18.00	100	1800	7,219	37,901	12,994,200	68,221,800
Coping Concrete (incl. formwork)	m	2.00	100	200	8,501	9,587	1,700,200	1,917,400
Concrete for Parapet Wall	m3	0.23	100	23	6,460	13,728	148,580	315,744
Formwork for Parapet Wall	m2	2.00	100	200	2,384	24	476,800	4,800
Concrete for U-ditch	m3	0.22	100	22	6,460	13,728	142,120	302,016
Formwork for U-ditch	m2	2.80	100	280	2,384	24	667,520	6,720
Gravel Bedding for U-ditch	m3	0.06	100	6	3,504	0	21,024	0
Concrete for Wall	m3	0.50	100	50	6,460	13,728	323,000	686,400
Formwork for Wall	m2	3.02	100	302	2,384	24	719,968	7,248
Gravel Bedding for Wall	m3	0.56	100	56	3,504	0	196,224	0
Concrete Pavement	m3	0.60	100	60	6,460	13,728	387,600	823,680
Base Course	m3	0.60	100	60	4,742	357	284,520	21,420
Riprap	m3	1.25	100	125	5,540	0	692,500	0

Kalu Oya (6)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	22.72	500	11360	43	0	488,480	0
Cutting of Top Soil Layer	m3	2.71	500	1355	507	1,184	686,985	1,604,320
Excavation	m3	0.88	500	440	694	373	305,360	164,120
Backfill	m3	0.65	500	325	1,783	563	579,475	182,975
Disposal of soil (Kalu Oya)	m3	0.00	500	0	187	437	0	0
Embankment	m3	7.53	500	3765	641	640	2,413,365	2,409,600
Turf	m2	6.59	500	3295	583	0	1,920,985	0
Concrete for U-ditch	m3	0.11	500	55	6,460	13,728	355,300	755,040
Formwork for U-ditch	m2	1.40	500	700	2,384	24	1,668,800	16,800
Gravel Bedding for U-ditch	m3	0.03	500	15	3,504	0	52,560	0
Concrete Pavement	m3	0.30	500	150	6,460	13,728	969,000	2,059,200
Base Course	m3	0.30	500	150	4,742	357	711,300	53,550

Source: JICA Study Team

Table 5 Detailed Construction Cost for the Kalu Oya and Mudun Ela Basin Improvement (3/10) (M/P)

Kalu Oya 2 (1)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	5.76	460	2649.6	43	0	113,933	0
Dredging	m3	15.13	460	6959.8	126	295	876,935	2,053,141
Excavation	m3	8.78	460	4038.8	694	373	2,802,928	1,506,473
Backfill	m3	1.10	460	506	1,783	563	902,198	284,878
Disposal of soil (Kalu Oya)	m3	22.55	460	10373	187	437	1,939,751	4,533,001
Embankment	m3	0.26	460	119.6	641	640	76,664	76,544
Supply and Installation of SSP	m2	18.00	460	8280	7,219	37,901	59,773,320	313,820,280
Coping Concrete (incl. formwork)	m	2.00	460	920	8,501	9,587	7,820,920	8,820,040
Concrete for Parapet Wall	m3	0.23	460	105.8	6,460	13,728	683,468	1,452,423
Formwork for Parapet Wall	m2	2.00	460	920	2,384	24	2,193,280	22,080
Concrete for U-ditch	m3	0.22	460	101.2	6,460	13,728	653,752	1,389,274
Formwork for U-ditch	m2	2.80	460	1288	2,384	24	3,070,592	30,912
Gravel Bedding for U-ditch	m3	0.06	460	27.6	3,504	0	96,711	0
Concrete for Wall	m3	0.50	460	230	6,460	13,728	1,485,800	3,157,440
Formwork for Wall	m2	3.02	460	1389.2	2,384	24	3,311,853	33,341
Gravel Bedding for Wall	m3	0.56	460	257.6	3,504	0	902,631	0
Compacted Pavement	m3	0.14	460	64.4	3,621	494	233,193	31,814
Riprap	m3	1.25	460	575	5,540	0	3,185,500	0

Kalu Oya 2 (2)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	6.92	200	1384	43	0	59,512	0
Dredging	m3	16.17	200	3234	126	295	407,484	954,030
Excavation	m3	27.97	200	5594	694	373	3,882,236	2,086,562
Backfill	m3	1.20	200	240	1,783	563	427,920	135,120
Disposal of soil (Kalu Oya)	m3	30.94	200	6188	187	437	1,157,156	2,704,156
Supply and Installation of SSP	m2	12.00	200	2400	7,219	37,901	17,325,600	90,962,400
Coping Concrete (incl. formwork)	m	2.00	200	400	8,501	9,587	3,400,400	3,834,800
Concrete for U-ditch	m3	0.22	200	44	6,460	13,728	284,240	604,032
Formwork for U-ditch	m2	2.80	200	560	2,384	24	1,335,040	13,440
Gravel Bedding for U-ditch	m3	0.06	200	12	3,504	0	42,048	0
Compacted Pavement	m3	0.14	200	28	3,621	494	101,388	13,832
Riprap	m3	1.25	200	250	5,540	0	1,385,000	0

Natha Canal

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	13.90	430	5977	43	0	257,011	0
Dredging	m3	7.20	430	3096	126	295	390,096	913,320
Excavation	m3	21.51	430	9249.3	694	373	6,419,015	3,449,989
Backfill	m3	9.40	430	4042	1,783	563	7,206,886	2,275,646
Disposal of soil (Kalu Oya)	m3	10.02	430	4308.6	187	437	805,709	1,882,859
Embankment	m3	9.29	430	3994.7	641	640	2,560,603	2,556,608
Gabion with Rock	m3	17.00	430	7310	9,651	1,838	70,548,810	13,435,780
Filter Cloths	m2	11.97	430	5147.1	468	0	2,408,843	0
Gabion Foundation Rock	m3	3.06	430	1315.8	5,097	1,522	6,706,633	2,002,648
Concrete for Top	m3	0.91	430	391.3	6,460	13,728	2,527,798	5,371,767
Formwork for Top	m2	0.91	430	391.3	2,384	24	932,860	9,392
Dowel Bar	m	1.60	430	688	498	408	342,624	280,704
Turf	m2	4.01	430	1724.3	583	0	1,005,267	0
Concrete for U-ditch	m3	0.22	430	94.6	6,460	13,728	611,116	1,298,669
Formwork for U-ditch	m2	2.80	430	1204	2,384	24	2,870,336	28,896
Gravel Bedding for U-ditch	m3	0.06	430	25.8	3,504	0	90,404	0
Concrete for Wall	m3	0.50	430	215	6,460	13,728	1,388,900	2,951,520
Formwork for Wall	m2	3.02	430	1298.6	2,384	24	3,095,863	31,167
Gravel Bedding for Wall	m3	0.56	430	240.8	3,504	0	843,764	0
Concrete Pavement	m3	0.60	430	258	6,460	13,728	1,666,680	3,541,824
Base Course	m3	0.60	430	258	4,742	357	1,223,436	92,106

Source: JICA Study Team

Table 6 Detailed Construction Cost for the Kalu Oya and Mudun Ela Basin Improvement (4/10) (M/P)

Old Dutch Canal (1)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m	34.83	2,070	72098.1	43	0	3,100,219	0
Dredging	m2	26.35	2,070	54544.5	126	295	6,872,607	16,090,628
Excavation	m2	44.73	2,070	92591.1	694	373	64,258,224	34,536,481
Backfill	m2	1.30	2,070	2691	1,783	563	4,798,053	1,515,033
Disposal of soil (Kalu Oya)	m2	64.97	2,070	134487.9	187	437	25,149,238	58,771,213
Embankment	m2	4.81	2,070	9956.7	641	640	6,382,245	6,372,288
Turf	m	11.18	2,070	23142.6	583	0	13,492,136	0
Concrete for U-ditch	m2	0.22	2,070	455.4	6,460	13,728	2,941,884	6,251,732
Formwork for U-ditch	m	2.80	2,070	5796	2,384	24	13,817,664	139,104
Gravel Bedding for U-ditch	m2	0.06	2,070	124.2	3,504	0	435,197	0
Concrete Pavement	m2	0.60	2,070	1242	6,460	13,728	8,023,320	17,050,176
Base Course	m2	0.60	2,070	1242	4,742	357	5,889,564	443,394

Old Dutch Canal (2)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	12.95	260	3367	43	0	144,781	0
Dredging	m3	24.21	260	6294.6	126	295	793,120	1,856,907
Excavation	m3	22.01	260	5722.6	694	373	3,971,485	2,134,530
Backfill	m3	1.48	260	384.8	1,783	563	686,099	216,643
Disposal of soil (Kalu Oya)	m3	26.74	260	6952.4	187	437	1,300,099	3,038,199
Supply and Installation of SSP	m2	18.00	260	4680	7,219	37,901	33,784,920	177,376,680
Coping Concrete (incl. formwork)	m	2.00	260	520	8,501	9,587	4,420,520	4,985,240
Concrete for Parapet Wall	m3	0.23	260	59.8	6,460	13,728	386,308	820,935
Formwork for Parapet Wall	m2	2.00	260	520	2,384	24	1,239,680	12,480
Concrete for U-ditch	m3	0.22	260	57.2	6,460	13,728	369,512	785,242
Formwork for U-ditch	m2	2.80	260	728	2,384	24	1,735,552	17,472
Gravel Bedding for U-ditch	m3	0.06	260	15.6	3,504	0	54,663	0
Concrete Pavement	m3	0.60	260	156	6,460	13,728	1,007,760	2,141,568
Base Course	m3	0.60	260	156	4,742	357	739,752	55,692
Riprap	m3	1.25	260	325	5,540	0	1,800,500	0

Old Dutch Canal (3)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	13.53	770	10418.1	43	0	447,979	0
Dredging	m3	18.00	770	13860	126	295	1,746,360	4,088,700
Excavation	m3	25.67	770	19765.9	694	373	13,717,535	7,372,681
Backfill	m3	9.58	770	7376.6	1,783	563	13,152,478	4,153,026
Disposal of soil (Kalu Oya)	m3	26.09	770	20089.3	187	437	3,756,700	8,779,025
Embankment	m3	8.00	770	6160	641	640	3,948,560	3,942,400
Gabion with Rock	m3	17.00	770	13090	9,651	1,838	126,331,590	24,059,420
Filter Cloths	m2	13.59	770	10464.3	468	0	4,897,293	0
Gabion Foundation Rock	m3	3.06	770	2356.2	5,097	1,522	12,009,552	3,586,137
Concrete for Top	m3	0.47	770	361.9	6,460	13,728	2,337,874	4,968,164
Formwork for Top	m2	1.01	770	777.7	2,384	24	1,854,037	18,665
Dowel Bar	m	1.60	770	1232	498	408	613,536	502,656
Turf	m2	4.01	770	3087.7	583	0	1,800,130	0
Concrete for U-ditch	m3	0.22	770	169.4	6,460	13,728	1,094,324	2,325,524
Formwork for U-ditch	m2	2.80	770	2156	2,384	24	5,139,904	51,744
Gravel Bedding for U-ditch	m3	0.06	770	46.2	3,504	0	161,885	0
Concrete for Wall	m3	0.50	770	385	6,460	13,728	2,487,100	5,285,280
Formwork for Wall	m2	3.02	770	2325.4	2,384	24	5,543,754	55,810
Gravel Bedding for Wall	m3	0.56	770	431.2	3,504	0	1,510,925	0
Concrete Pavement	m3	0.60	770	462	6,460	13,728	2,984,520	6,342,336
Base Course	m3	0.60	770	462	4,742	357	2,190,804	164,934

Source: JICA Study Team

Table 7 Detailed Construction Cost for the Kalu Oya and Mudun Ela Basin Improvement (5/10) (M/P)

Old Dutch Canal (4)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	22.65	600	13590	43	0	584,370	0
Dredging	m3	9.78	600	5868	126	295	739,368	1,731,060
Excavation	m3	27.31	600	16386	694	373	11,371,884	6,111,978
Backfill	m3	0.80	600	480	1,783	563	855,840	270,240
Disposal of soil (Kalu Oya)	m3	29.15	600	17490	187	437	3,270,630	7,643,130
Embankment	m3	7.14	600	4284	641	640	2,746,044	2,741,760
Supply and Installation of SSP	m2	18.00	600	10800	7,219	37,901	77,965,200	409,330,800
Coping Concrete (incl. formwork)	m	2.00	600	1200	8,501	9,587	10,201,200	11,504,400
Concrete for Parapet Wall	m3	0.23	600	138	6,460	13,728	891,480	1,894,464
Formwork for Parapet Wall	m2	2.00	600	1200	2,384	24	2,860,800	28,800
Concrete for U-ditch	m3	0.22	600	132	6,460	13,728	852,720	1,812,096
Formwork for U-ditch	m2	2.80	600	1680	2,384	24	4,005,120	40,320
Gravel Bedding for U-ditch	m3	0.06	600	36	3,504	0	126,144	0
Concrete for Stone Masonry	m3	1.29	600	774	6,460	13,728	5,000,040	10,625,472
Formwork for Stone Masonry	m2	5.15	600	3090	2,384	24	7,366,560	74,160
Rock for Stone Masonry	m3	0.58	600	348	3,328	0	1,158,144	0
Gravel for Stone Masonry	m3	1.06	600	637.8	3,504	0	2,234,852	0
Base Concrete for Stone Masonry	m3	0.26	600	156	6,460	13,728	1,007,760	2,141,568
Lean Concrete for Stone Masonry	m3	0.06	600	36	6,460	13,728	232,560	494,208
Concrete Pavement	m3	0.60	600	360	6,460	13,728	2,325,600	4,942,080
Base Course	m3	0.60	600	360	4,742	357	1,707,120	128,520
Riprap	m3	1.25	600	750	5,540	0	4,155,000	0

Old Dutch Canal (5)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	15.88	300	4764	43	0	204,852	0
Dredging	m3	23.26	300	6978	126	295	879,228	2,058,510
Excavation	m3	32.77	300	9831	694	373	6,822,714	3,666,963
Backfill	m3	11.07	300	3321	1,783	563	5,921,343	1,869,723
Disposal of soil (Kalu Oya)	m3	30.58	300	9174	187	437	1,715,538	4,009,038
Embankment	m3	14.38	300	4314	641	640	2,765,274	2,760,960
Gabion with Rock	m3	17.00	300	5100	9,651	1,838	49,220,100	9,373,800
Filter Cloths	m2	13.69	300	4107	468	0	1,922,076	0
Gabion Foundation Rock	m3	3.06	300	918	5,097	1,522	4,679,046	1,397,196
Concrete for Top	m3	0.47	300	141	6,460	13,728	910,860	1,935,648
Formwork for Top	m2	1.01	300	303	2,384	24	722,352	7,272
Dowel Bar	m	1.60	300	480	498	408	239,040	195,840
Turf	m2	6.25	300	1875	583	0	1,093,125	0
Concrete for U-ditch	m3	0.22	300	66	6,460	13,728	426,360	906,048
Formwork for U-ditch	m2	2.80	300	840	2,384	24	2,002,560	20,160
Gravel Bedding for U-ditch	m3	0.06	300	18	3,504	0	63,072	0
Concrete for Wall	m3	0.50	300	150	6,460	13,728	969,000	2,059,200
Formwork for Wall	m2	3.02	300	906	2,384	24	2,159,904	21,744
Gravel Bedding for Wall	m3	0.56	300	168	3,504	0	588,672	0
Concrete Pavement	m3	0.60	300	180	6,460	13,728	1,162,800	2,471,040
Base Course	m3	0.60	300	180	4,742	357	853,560	64,260

Old Dutch Canal (6)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	11.00	880	9680	43	0	416,240	0
Dredging	m3	12.35	880	10868	126	295	1,369,368	3,206,060
Excavation	m3	31.10	880	27368	694	373	18,993,392	10,208,264
Backfill	m3	1.30	880	1144	1,783	563	2,039,752	644,072
Disposal of soil (Kalu Oya)	m3	30.15	880	26532	187	437	4,961,484	11,594,484
Supply and Installation of SSP	m2	12.00	880	10560	7,219	37,901	76,232,640	400,234,560
Coping Concrete (incl. formwork)	m	2.00	880	1760	8,501	9,587	14,961,760	16,873,120
Concrete for Parapet Wall	m3	0.23	880	202.4	6,460	13,728	1,307,504	2,778,548
Formwork for Parapet Wall	m2	2.00	880	1760	2,384	24	4,195,840	42,240
Concrete for U-ditch	m3	0.22	880	193.6	6,460	13,728	1,250,656	2,657,741
Formwork for U-ditch	m2	2.80	880	2464	2,384	24	5,874,176	59,136
Gravel Bedding for U-ditch	m3	0.06	880	52.8	3,504	0	185,012	0
Compacted Pavement	m3	0.14	880	123.2	3,621	494	446,108	60,861
Riprap	m3	1.25	880	1100	5,540	0	6,094,000	0

Source: JICA Study Team

Table 8 Detailed Construction Cost for the Kalu Oya and Mudun Ela Basin Improvement (6/10) (M/P)

Old Dutch Diversion

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	5.80	330	1914	43	0	82,302	0
Dredging	m3	9.00	330	2970	126	295	374,220	876,150
Excavation	m3	4.84	330	1597.2	694	373	1,108,457	595,756
Backfill	m3	3.92	330	1293.6	1,783	563	2,306,489	728,297
Disposal of soil (Kalu Oya)	m3	9.70	330	3201	187	437	598,587	1,398,837
Embankment	m3	0.22	330	72.6	641	640	46,537	46,464
Supply and Installation of SSP	m2	18.00	330	5940	7,219	37,901	42,880,860	225,131,940
Coping Concrete (incl. formwork)	m	2.00	330	660	8,501	9,587	5,610,660	6,327,420
Concrete for Parapet Wall	m3	0.23	330	75.9	6,460	13,728	490,314	1,041,956
Formwork for Parapet Wall	m2	2.00	330	660	2,384	24	1,573,440	15,840
Concrete for U-ditch	m3	0.22	330	72.6	6,460	13,728	468,996	996,653
Formwork for U-ditch	m2	2.80	330	924	2,384	24	2,202,816	22,176
Gravel Bedding for U-ditch	m3	0.06	330	19.8	3,504	0	69,380	0
Concrete for Wall	m3	0.50	330	165	6,460	13,728	1,065,900	2,265,120
Formwork for Wall	m2	3.02	330	996.6	2,384	24	2,375,895	23,919
Gravel Bedding for Wall	m3	0.56	330	184.8	3,504	0	647,540	0
Compacted Pavement	m3	0.14	330	46.2	3,621	494	167,291	22,823
Riprap	m3	1.25	330	412.5	5,540	0	2,285,250	0

Mudun Ela (1)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	9.33	100	933	43	0	40,119	0
Dredging	m3	7.46	100	746	126	295	93,996	220,070
Excavation	m3	5.46	100	546	694	373	378,924	203,658
Backfill	m3	1.40	100	140	1,783	563	249,620	78,820
Disposal of soil (Kalu Oya)	m3	3.30	100	330	187	437	61,710	144,210
Embankment	m3	8.22	100	822	641	640	526,902	526,080
Supply and Installation of SSP	m2	6.00	100	600	7,219	37,901	4,331,400	22,740,600
Coping Concrete (incl. formwork)	m	1.00	100	100	8,501	9,587	850,100	958,700
Concrete for Parapet Wall	m3	0.11	100	11	6,460	13,728	71,060	151,008
Formwork for Parapet Wall	m2	1.00	100	100	2,384	24	238,400	2,400
Gabion with Rock	m3	3.50	100	350	9,651	1,838	3,377,850	643,300
Filter Cloths	m2	4.72	100	472	468	0	220,896	0
Gabion Foundation Rock	m3	1.75	100	175	5,097	1,522	891,975	266,350
Concrete for Top	m3	0.75	100	75	6,460	13,728	484,500	1,029,600
Formwork for Top	m2	1.38	100	138	2,384	24	328,992	3,312
Dowel Bar	m	0.80	100	80	498	408	39,840	32,640
Turf	m2	2.01	100	201	583	0	117,183	0
Concrete for U-ditch	m3	0.22	100	22	6,460	13,728	142,120	302,016
Formwork for U-ditch	m2	2.80	100	280	2,384	24	667,520	6,720
Gravel Bedding for U-ditch	m3	0.06	100	6	3,504	0	21,024	0
Concrete for Wall	m3	0.25	100	25	6,460	13,728	161,500	343,200
Formwork for Wall	m2	1.51	100	151	2,384	24	359,984	3,624
Gravel Bedding for Wall	m3	0.28	100	28	3,504	0	98,112	0
Compacted Pavement	m3	0.05	100	5	3,621	494	18,105	2,470
Concrete Pavement	m3	0.30	100	30	6,460	13,728	193,800	411,840
Base Course	m3	0.30	100	30	4,742	357	142,260	10,710

Source: JICA Study Team

Table 9 Detailed Construction Cost for the Kalu Oya and Mudun Ela Basin Improvement (7/10) (M/P)

Mudun Ela (2)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	17.65	2460	43419	43	0	1,867,017	0
Dredging	m3	5.55	2460	13653	126	295	1,720,278	4,027,635
Excavation	m3	18.59	2460	45731.4	694	373	31,737,592	17,057,813
Backfill	m3	5.36	2460	13185.6	1,783	563	23,509,925	7,423,493
Disposal of soil (Kalu Oya)	m3	11.35	2460	27921	187	437	5,221,227	12,201,477
Embankment	m3	7.43	2460	18277.8	641	640	11,716,070	11,697,792
Gabion with Rock	m3	7.00	2460	17220	9,651	1,838	166,190,220	31,650,360
Filter Cloths	m2	4.73	2460	11635.8	468	0	5,445,555	0
Gabion Foundation Rock	m3	3.51	2460	8634.6	5,097	1,522	44,010,557	13,141,862
Concrete for Top	m3	1.50	2460	3690	6,460	13,728	23,837,400	50,656,320
Formwork for Top	m2	2.75	2460	6765	2,384	24	16,127,760	162,360
Dowel Bar	m	1.60	2460	3936	498	408	1,960,128	1,605,888
Turf	m2	4.01	2460	9864.6	583	0	5,751,062	0
Concrete for U-ditch	m3	0.22	2460	541.2	6,460	13,728	3,496,152	7,429,594
Formwork for U-ditch	m2	2.80	2460	6888	2,384	24	16,420,992	165,312
Gravel Bedding for U-ditch	m3	0.06	2460	147.6	3,504	0	517,191	0
Concrete for Wall	m3	0.50	2460	1230	6,460	13,728	7,945,800	16,885,440
Formwork for Wall	m2	3.02	2460	7429.2	2,384	24	17,711,213	178,301
Gravel Bedding for Wall	m3	0.56	2460	1377.6	3,504	0	4,827,111	0
Concrete Pavement	m3	0.60	2460	1476	6,460	13,728	9,534,960	20,262,528
Base Course	m3	0.60	2460	1476	4,742	357	6,999,192	526,932

Mudun Ela (3)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	14.91	110	1640.1	43	0	70,525	0
Dredging	m3	11.99	110	1318.9	126	295	166,182	389,076
Excavation	m3	18.56	110	2041.6	694	373	1,416,871	761,517
Backfill	m3	1.55	110	170.5	1,783	563	304,002	95,992
Disposal of soil (Kalu Oya)	m3	17.00	110	1870	187	437	349,690	817,190
Supply and Installation of SSP	m2	12.00	110	1320	7,219	37,901	9,529,080	50,029,320
Coping Concrete (incl. formwork)	m	2.00	110	220	8,501	9,587	1,870,220	2,109,140
Concrete for Parapet Wall	m3	0.23	110	25.3	6,460	13,728	163,438	347,319
Formwork for Parapet Wall	m2	2.00	110	220	2,384	24	524,480	5,280
Concrete for U-ditch	m3	0.22	110	24.2	6,460	13,728	156,332	332,218
Formwork for U-ditch	m2	2.80	110	308	2,384	24	734,272	7,392
Gravel Bedding for U-ditch	m3	0.06	110	6.6	3,504	0	23,127	0
Concrete Pavement	m3	0.60	110	66	6,460	13,728	426,360	906,048
Base Course	m3	0.60	110	66	4,742	357	312,972	23,562

Mudun Ela (4)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	14.91	230	3429.3	43	0	147,460	0
Dredging	m3	2.99	230	687.7	126	295	86,651	202,872
Excavation	m3	18.56	230	4268.8	694	373	2,962,548	1,592,263
Backfill	m3	1.55	230	356.5	1,783	563	635,640	200,710
Disposal of soil (Kalu Oya)	m3	8.00	230	1840	187	437	344,080	804,080
Supply and Installation of SSP	m2	12.00	230	2760	7,219	37,901	19,924,440	104,606,760
Coping Concrete (incl. formwork)	m	2.00	230	460	8,501	9,587	3,910,460	4,410,020
Concrete for Parapet Wall	m3	0.23	230	52.9	6,460	13,728	341,734	726,212
Formwork for Parapet Wall	m2	2.00	230	460	2,384	24	1,096,640	11,040
Concrete for U-ditch	m3	0.22	230	50.6	6,460	13,728	326,876	694,637
Formwork for U-ditch	m2	2.80	230	644	2,384	24	1,535,296	15,456
Gravel Bedding for U-ditch	m3	0.06	230	13.8	3,504	0	48,356	0
Concrete Pavement	m3	0.60	230	138	6,460	13,728	891,480	1,894,464
Base Course	m3	0.60	230	138	4,742	357	654,396	49,266

Mudun Ela (5) (upstream 1)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Dredging	m3	1.53	1106	1692.18	126	295	213,215	499,194
Disposal of soil (Kalu Oya)	m3	1.53	1106	1692.18	187	437	316,438	739,483

Source: JICA Study Team

Table 10 Detailed Construction Cost for the Kalu Oya and Mudun Ela Basin Improvement (8/10) (M/P)

Mudun Ela (6) (upstream 2)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Dredging	m3	5.79	150	868.5	126	295	109,431	256,208
Disposal of soil (Kalu Oya)	m3	5.79	150	868.5	187	437	162,410	379,535

Mudun Ela (7) (upstream 3)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Dredging	m3	4.58	123	563.34	126	295	70,981	166,186
Backfill	m3	1.11	123	136.53	1,783	563	243,433	76,867
Disposal of soil (Kalu Oya)	m3	3.47	123	426.81	187	437	79,814	186,516
Gabion with Rock	m3	2.00	123	246	9,651	1,838	2,374,146	452,148
Filter Cloths	m2	4.00	123	492	468	0	230,256	0
Gabion Foundation Rock	m3	0.81	123	99.63	5,097	1,522	507,815	151,637

Mudun Ela (8) (upstream 4)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Dredging	m3	3.94	496	1954.24	126	295	246,235	576,501
Backfill	m3	0.58	496	287.68	1,783	563	512,934	161,964
Disposal of soil (Kalu Oya)	m3	3.36	496	1666.56	187	437	311,647	728,287
Gabion with Rock	m3	1.00	496	496	9,651	1,838	4,786,896	911,648
Filter Cloths	m2	2.00	496	992	468	0	464,256	0
Gabion Foundation Rock	m3	0.46	496	228.16	5,097	1,522	1,162,932	347,260

Mudun Ela (9) (upstream 5)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	14.39	1,050	15109.5	43	0	649,709	0
Dredging	m3	2.95	1,050	3100.65	126	295	390,682	914,692
Embankment	m3	11.53	1,050	12106.5	641	640	7,760,267	7,748,160
Turf	m2	8.80	1,050	9240	583	0	5,386,920	0
Concrete Pavement	m3	0.90	1,050	945	6,460	13,728	6,104,700	12,972,960
Base Course	m3	0.90	1,050	945	4,742	357	4,481,190	337,365

Tanks (Ihalagama (813m), Kapuwa Wewa (1,839m), Ragama (1,302m))

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	3.61	3,954	14,274	43	0	613,780	0
Excavation	m3	1.00	3,954	3,954	694	373	2,744,076	1,474,842
Disposal of soil (Kalu Oya)	m3	1.00	3,954	3,954	187	437	739,398	1,727,898
Turf	m2	3.61	3,954	14,274	583	0	8,321,708	0

Surrounding Dike for Retarding Basin 1

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Site clearing	m2			27,600	117	117	3,229,200	3,229,200
Cutting of top soil layer	m3			8,280	507	1,184	4,197,960	9,803,520
Dredging	m3			332,500	126	295	41,895,000	98,087,500
Excavation	m3			13,524	694	373	9,385,656	5,044,452
Backfill	m3			7,981	1,783	563	14,230,123	4,493,303
Disposal of soil (Kalu Oya)	m3			346,323	187	437	64,762,401	151,343,151
Embankment	m3			24,150	641	640	15,480,150	15,456,000
Turf	m2			17,729	583	0	10,336,007	0
Concrete for U-ditch	m3			1,932	6,460	13,728	12,480,720	26,522,496
Formwork for U-ditch	m2			11,155	2,384	24	26,593,520	267,720
Gravel Bedding for U-ditch	m3			4,140	3,504	0	14,506,560	0
Compacted pavement	m3			1,380	3,621	494	4,996,980	681,720
Kerb	m			2,300	4,418	0	10,161,400	0

Source: JICA Study Team

**Table 11 Detailed Construction Cost for the Kalu Oya and Mudun Ela Basin Improvement (9/10)
(M/P)**

Surrounding Dike for Retarding Basin 2+3+4

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Site clearing	m2			79,200	117	117	9,266,400	9,266,400
Cutting of top soil layer	m3			23,760	507	1,184	12,046,320	28,131,840
Dredging	m3			3,949,000	126	295	497,574,000	1,164,955,000
Excavation	m3			58,212	694	373	40,399,128	21,713,076
Backfill	m3			34,353	1,783	563	61,251,399	19,340,739
Disposal of soil (Kalu Oya)	m3			3,996,619	187	437	747,367,753	1,746,522,503
Embankment	m3			24,750	641	640	15,864,750	15,840,000
Turf	m2			32,038	583	0	18,678,154	0
Concrete for U-ditch	m3			8,316	6,460	13,728	53,721,360	114,162,048
Formwork for U-ditch	m2			48,015	2,384	24	114,467,760	1,152,360
Gravel Bedding for U-ditch	m3			17,820	3,504	0	62,441,280	0
Compacted pavement	m3			5,940	3,621	494	21,508,740	2,934,360
Kerb	m			9,900	4,418	0	43,738,200	0

Surrounding Dike for Retarding Basin 5

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Site clearing	m2			78,400	117	117	9,172,800	9,172,800
Cutting of top soil layer	m3			23,520	507	1,184	11,924,640	27,847,680
Dredging	m3			531,000	126	295	66,906,000	156,645,000
Excavation	m3			32,928	694	373	22,852,032	12,282,144
Backfill	m3			19,432	1,783	563	34,647,256	10,940,216
Disposal of soil (Kalu Oya)	m3			568,016	187	437	106,218,992	248,222,992
Embankment	m3			89,600	641	640	57,433,600	57,344,000
Turf	m2			55,688	583	0	32,466,104	0
Concrete for U-ditch	m3			4,704	6,460	13,728	30,387,840	64,576,512
Formwork for U-ditch	m2			27,160	2,384	24	64,749,440	651,840
Gravel Bedding for U-ditch	m3			10,080	3,504	0	35,320,320	0
Compacted pavement	m3			3,360	3,621	494	12,166,560	1,659,840
Kerb	m			5,600	4,418	0	24,740,800	0

Source: JICA Study Team

Table 12 Detailed Construction Cost for the Kalu Oya and Mudun Ela Basin Improvement (10/10) (M/P)

Kalu Oya (1)

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Bridge 1	m2	426	112,308	449,230	47,843,038	191,372,151
Bridge 2	m2	284	112,308	449,230	31,895,359	127,581,434
Total	m2				79,738,397	318,953,585

Kalu Oya (2)

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Bridge 3	m2	448	112,308	449,230	50,313,805	201,255,220

Kalu Oya 2 (2)

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Bridge 4	m2	82	112,308	449,230	9,209,224	36,836,893
Bridge 5	m2	128	112,308	449,230	14,375,373	57,501,492
Total	m2				23,584,597	94,338,385

Old Dutch Canal (2)

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Bridge 6	m2	223	112,308	449,230	25,044,595	100,178,380

Old Dutch Canal (6)

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Bridge 7	m2	301	112,308	449,230	33,804,588	135,218,351

Mudun Ela (2)

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Bridge 8	m2	166	112,308	449,230	18,530,754	74,123,016
Bridge 9	m2	166	112,308	449,230	18,643,062	74,572,247
Total	m2				37,173,816	148,695,263

Mudun Ela (5) (upstream 1)

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Bridge 10	m2	55	112,308	449,230	6,176,918	24,707,672
Bridge 11	m2	44	112,308	449,230	4,941,535	19,766,138
Total	m2				11,118,453	44,473,810

Mudun Ela (6) (upstream 2)

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Bridge 12	m2	63	112,308	449,230	7,075,379	28,301,516
Total	m2				7,075,379	28,301,516

Mudun Ela (7) (upstream 3)

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Bridge 13	m2	23	112,308	449,230	2,583,075	10,332,300
Total	m2				2,583,075	10,332,300

Mudun Ela (in the regulation pond)

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Bridge 15	m2	85	112,308	449,230	9,546,146	38,184,584
Total	m2				9,546,146	38,184,584

sample information of bridge construction under SLLDC

$$10.4 \text{ (m)} \times 40 \text{ (m)} = 416 \text{ (m}^2\text{)} = 233.6 \text{ million LKR}$$

$$1 \text{ (m}^2\text{)} = 561.538 \text{ LKR}$$

Assuming that the local portion to the foreign portion of the bridge construction is at 2 to 8.

Peliyagoda Pumping Station Improvement

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Procurement of equipment (Pump,	LS	1	2,172,720	19,554,480	2,172,720	19,554,480
Installation	LS	1	5,000,000	0	5,000,000	0
Total					7,172,720	19,554,480

Source: JICA Study Team

Table 13 Quantity of the Surrounding Dike in the Kalu Oya Basin (1/3)

Rough Quantity of Surrounding Dike for Retarding Basin 1

Description	Unit	Quantity
Site clearing	m ²	27,600
Cutting of top soil layer	m ³	8,280
Dredging	m ³	332,500
Excavation	m ³	13,524
Backfill	m ³	7,981
Disposal of soil (Kalu Oya)	m ³	346,323
Embankment	m ³	24,150
Turf	m ²	17,729
Concrete for U-ditch	m ³	1,932
Formwork for U-ditch	m ²	11,155
Gravel Bedding for U-ditch	m ³	4,140
Compacted pavement	m ³	1,380
Kerb	m	2,300
Total		

The average height of the surrounding dike:

1.5 m

Dike crown width:

4.0 m

Pavement width:

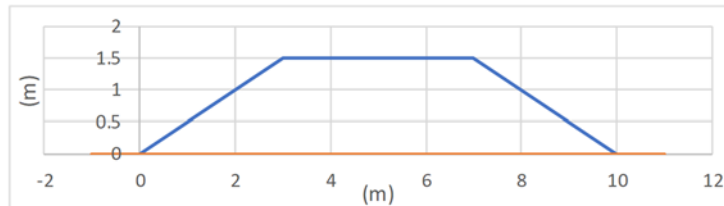
3.0 m

Slope of dike

2.0 to 1.0

Length of dike

2,300 m

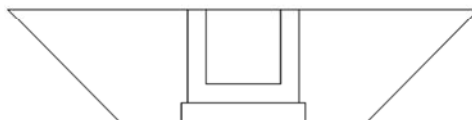


Quantities per section

Width of clearing:	$4 + 1.5 \times 2 \times 2 + 2 =$	12.00 m
Embankment:	$(4 \times 2 + 1.5 \times 2 \times 2) \times 1.5 / 2 =$	10.50 m ²
Turf:	$(\text{sqrt}(1.5^2 + (1.5 \times 2)^2) + 0.5) \times 2 =$	7.71 m
Compacted pavement (t=200mm):	$3 \times 0.2 =$	0.60 m ²

Quantities for U ditch (1.0m x 1.0m) per section

Excavation:	5.88 m ²
Backfill:	3.47 m ²
Concrete:	0.84 m ²
Formworks:	4.85 m
Gravel bedding:	1.80 m ²



Cost for a gate (1m x 1.8m x 1 gate)

Cost:	Area of gate 1.8 m ²	Cost 3,222,222 LKR
Reference:	64.8 m ²	116,000,000 LKR

Table 14 Quantity of the Surrounding Dike in the Kalu Oya Basin (2/3)

Rough Quantity of Surrounding Dike for Retarding Basin 2+3+4

Description	Unit	Quantity
Site clearing	m2	79,200
Cutting of top soil layer	m3	23,760
Dredging	m3	3,949,000
Excavation	m3	58,212
Backfill	m3	34,353
Disposal of soil (Kalu Oya)	m3	3,996,619
Embankment	m3	24,750
Turf	m2	32,038
Concrete for U-ditch	m3	8,316
Formwork for U-ditch	m2	48,015
Gravel Bedding for U-ditch	m3	17,820
Compacted pavement	m3	5,940
Kerb	m	9,900
Total		

The average height of the surrounding dike:

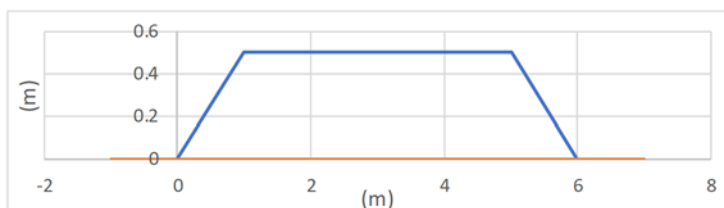
Dike crown width:

Pavement width:

Slope of dike

Length of dike

0.5 m
4.0 m
3.0 m
2.0 to 1.0
9,900 m

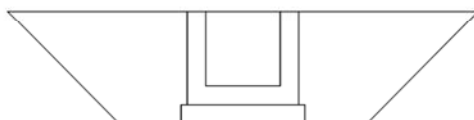


Quantities per section

Width of clearing:	$4 + 0.5 \times 2 \times 2 + 2 =$	8.00 m
Embankment:	$(4 \times 2 + 0.5 \times 2 \times 2) \times 0.5 / 2 =$	2.50 m ²
Turf:	$(\sqrt{0.5^2 + (0.5 \times 2)^2} + 0.5) \times 2 =$	3.24 m
Compacted pavement (t=200mm):	$3 \times 0.2 =$	0.60 m ²

Quantities for U ditch (1.0m x 1.0m) per section

Excavation:	5.88 m ²
Backfill:	3.47 m ²
Concrete:	0.84 m ²
Formworks:	4.85 m
Gravel bedding:	1.80 m ²



Cost for 3 gates (1m x 1.3m + 1m x 1.7m + 1m x 2.2m)

	Area of gate	Cost
Cost:	5.2 m ²	9,308,642 LKR
Reference:	64.8 m ²	116,000,000 LKR

Table 15 Quantity of the Surrounding Dike in the Kalu Oya Basin (3/3)

Rough Quantity of Surrounding Dike for Retarding Basin 5

Description	Unit	Quantity
Site clearing	m ²	78,400
Cutting of top soil layer	m ³	23,520
Dredging	m ³	531,000
Excavation	m ³	32,928
Backfill	m ³	19,432
Disposal of soil (Kalu Oya)	m ³	568,016
Embankment	m ³	89,600
Turf	m ²	55,688
Concrete for U-ditch	m ³	4,704
Formwork for U-ditch	m ²	27,160
Gravel Bedding for U-ditch	m ³	10,080
Compacted pavement	m ³	3,360
Kerb	m	5,600
Total		

The average height of the surrounding dike:

2.0 m

Dike crown width:

4.0 m

Pavement width:

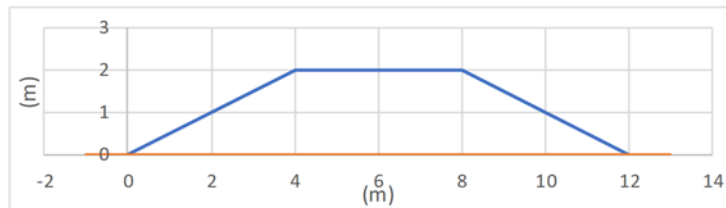
3.0 m

Slope of dike

2.0 to 1.0

Length of dike

5,600 m

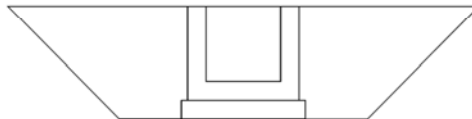


Quantities per section

Width of clearing:	$4 + 2 \times 2 \times 2 + 2 =$	14.00 m
Embankment:	$(4 \times 2 + 2 \times 2 \times 2) \times 2 / 2 =$	16.00 m ²
Turf:	$(\sqrt{2^2 + (2 \times 2)^2} + 0.5) \times 2 =$	9.94 m
Compacted pavement (t=200mm):	$3 \times 0.2 =$	0.60 m ²

Quantities for U ditch (1.0m x 1.0m) per section

Excavation:	5.88 m ²
Backfill:	3.47 m ²
Concrete:	0.84 m ²
Formworks:	4.85 m
Gravel bedding:	1.80 m ²



Cost for a gate (1m x 2.3m x 1 gate)

Cost:	Area of gate 2.3 m ²	Cost 4,117,284 LKR
Reference:	64.8 m ²	116,000,000 LKR

Table 16 Construction Cost for the Retarding Basin in the Mudun Ela Sub-basin (M/P)

Mudun Ela Sub-basin Regulation Pond

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Site Clearing	m2		6,586	52,688	117	117	6,164,496	6,164,496
Cutting of top soil layer	m3		6,586	15,806	507	1,184	8,013,845	18,714,778
Dredging	m3		6,586	180,995	126	295	22,805,307	53,393,378
Excavation	m3		6,586	17,190	694	373	11,929,860	6,411,870
Backfill	m3		6,586	11,757	1,783	563	20,962,731	6,619,191
Disposal of soil (Kalu Oya)	m3		6,586	160,957	187	437	30,098,894	70,338,057
Embankment	m3		6,586	16,465	641	640	10,554,065	10,537,600
Turf	m2		6,586	21,313	583	0	12,425,479	0
Concrete for U-ditch	m3		6,586	2,075	6,460	13,728	13,404,500	28,485,600
Formwork for U-ditch	m2		6,586	19,758	2,384	24	47,103,072	474,192
Gravel Bedding for U-ditch	m3		6,586	6,586	3,504	0	23,077,344	0
Compacted Pavement	m3		6,586	3,952	3,621	494	14,310,192	1,952,288
Kerb	m		6,586	6,586	4,418	0	29,096,948	0

Source: JICA Study Team

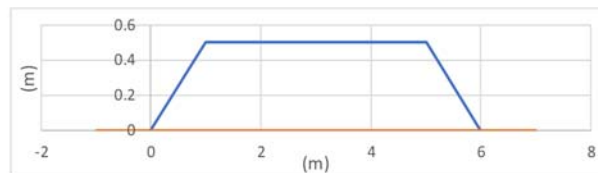
Table 17 Detailed Construction Cost for the Retarding Basin in the Mudun Ela Sub-basin (M/P)

Rough Quantity and Cost Estimation of Mudun Ela Pond Dike

Description	Unit	Quantity
Site clearing	m2	52,688
Cutting of top soil layer	m3	15,806
Excavation	m3	17,190
Backfill	m3	11,757
Disposal of excavated material (35km)	m3	0
Embankment	m3	16,465
Turf	m2	21,313
Concrete for U-ditch	m3	2,075
Formwork for U-ditch	m2	19,758
Gravel Bedding for U-ditch	m3	6,586
Compacted pavement	m3	3,952
Kerb	m	6,586
Total		

The average height of the protective diking system:

Dike crown width:	0.5 m
Pavement width:	4.0 m
Slope of dike	3.0 m
Length of dike1	2.0 to 1.0
Length of dike2	2,207.0
Length of dike3	2,635.0
dike length along river	2,794.0
Total length of dike	-1,050.0
	6,586.0 m

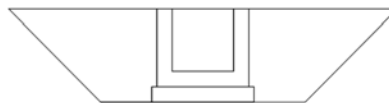


Quantities per section

Width of clearing:	$4 + 0.5 \times 2 \times 2 + 2 =$	8.00 m
Embankment:	$(4 \times 2 + 0.5 \times 2 \times 2) \times 0.5 / 2 =$	2.50 m ²
Turf:	$(\text{sqrt}(0.5^2 + (0.5 \times 2)^2) + 0.5) \times 2 =$	3.24 m
Compacted pavement (t=200mm):	$3 \times 0.2 =$	0.60 m ²

Quantities for U ditch (0.6m x 0.6m) per section

Excavation:	2.61 m ²
Backfill:	1.785 m ²
Concrete:	0.315 m ²
Formworks:	3.00 m
Gravel bedding:	1.00 m ²



Rough Quantity and Cost Estimation of Mudun Ela Pond Dredging

Description	Unit	Quantity
Dredging	m3	180,995
Total		

Quantities

	172,320.0
	92,926.0
	96,743.0
Area:	361,989.0 m ²
Dredging depth:	0.5 m
Dredging volume:	180,994.5 m ³

Table 18 Quantity of Dredging in Peliyagoda Canal (M/P)

Dredging area (m2)

Section	Distance (m)	Distance (m)	Dredging area (m2)	Area in aveerage (m2)	Dredging volume (m3)
1	0	0	0	—	—
7	185	185	7	0	0
13	341	156	6	7	1,021
17	570	229	9	8	1,728
19	743	173	13	11	1,878
24	981	238	4	8	1,997
26	1,144	163	2	3	515
28	1,366	222	0	1	312
33	1,575	209	6	3	684
40	1,788	213	0	3	659
46	1,991	203	5	2	493
52	2,197	206	4	4	920
58	2,394	197	0	2	401
64	2,492	98	5	2	232
73	2,770	278	16	11	2,936
					13,776

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Dredging	m3	13,776	126	295	1,735,776	4,063,920	5,799,696
Total					1,735,776	4,063,920	5,799,696

Peliyagoda Dredging

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory W	86,789	203,196	289,985
Earth work	1,735,776	4,063,920	5,799,696
Others	173,578	406,392	579,970
Total	1,996,143	4,673,508	6,669,651

Source: JICA Study Team

Table 19 Land Acquisition and Compensation Cost for the Kalu Oya and Mudun Ela Basin Improvement (M/P)

Kalu Oya Basin

Description	Cost LC (LKR)	Cost FC (LKR)
Land Acquisition	3,313,043,219	0
Affected building compensation	140,095,638	0
Land acquisition for resettlement	0	0
Total	3,453,138,857	0

Mudun Ela Sub-basin (upstream)

Description	Cost LC (LKR)	Cost FC (LKR)
Land Acquisition	297,907,815	0
Affected building compensation	0	0
Land acquisition for resettlement	0	0
Total	297,907,815	0

Mudun Ela Sub-basin (downstream)

Description	Cost LC (LKR)	Cost FC (LKR)
Land Acquisition	1,281,217,080	0
Affected building compensation	7,770,736	0
Land acquisition for resettlement	0	0
Total	1,288,987,816	0

Kalu Oya Basin and Mudun Ela Sub-basin

Description	Cost LC (LKR)	Cost FC (LKR)
Land Acquisition	4,892,168,114	0
Affected building compensation	147,866,374	0
Land acquisition for resettlement	0	0
Total	5,040,034,488	0

Source: JICA Study Team

Table 20 Land Acquisition Cost for the Kalu Oya and Mudun Ela Basin Improvement (M/P)

Land Acquisition

Description	Unit	Quantity (m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Kalu Oya (1)	m2	8.22	1,720	14,138	39,400	0	557,052,960	0
Kalu Oya (2)	m2	4.68	780	3,650	39,400	0	143,825,760	0
Kalu Oya (3)	m2	6.34	100	634	39,400	0	24,979,600	0
Kalu Oya (4)	m2	13.40	1,300	17,420	39,400	0	686,348,000	0
Kalu Oya (5)	m2	10.91	100	1,091	39,400	0	42,985,400	0
Kalu Oya (6)	m2	16.72	500	8,360	39,400	0	329,384,000	0
Kalu Oya 2 (1)	m2	3.76	460	1,730	39,400	0	68,146,240	0
Kalu Oya 2 (2)	m2	8.55	200	1,710	39,400	0	67,374,000	0
Kalu Oya sub-total				48,733			1,920,095,960	
Natha Canal	m2	8.27	430	3,556	39,400	0	140,110,340	0
Natha Canal sub-total				3,556			140,110,340	
Old Dutch Canal (1)	m2	28.83	2,070	59,678	790	0	47,145,699	0
Old Dutch Canal (2)	m2	10.95	260	2,847	39,400	0	112,171,800	0
Old Dutch Canal (3)	m2	4.19	770	3,226	39,400	0	127,116,220	0
Old Dutch Canal (4)	m2	20.65	600	12,390	39,400	0	488,166,000	0
Old Dutch Canal (5)	m2	9.88	300	2,964	39,400	0	116,781,600	0
Old Dutch Canal (6)	m2	9.00	880	7,920	39,400	0	312,048,000	0
Old Dutch Diversion	m2	3.80	330	1,254	39,400	0	49,407,600	0
Old Dutch sub-total				90,279			1,252,836,919	
Kalu Oya Basin subtotal				142,569			3,313,043,219	0
Mudun Ela (1)	m2	5.03	100	503	39,400	0	19,818,200	0
Mudun Ela (2)	m2	11.23	2,460	27,626	39,400	0	1,088,456,520	0
Mudun Ela (3)	m2	12.91	110	1,420	39,400	0	55,951,940	0
Mudun Ela (4)	m2	12.91	230	2,969	39,400	0	116,990,420	0
Mudun Ela Sub-basin subotal (downstream)				32,518			1,281,217,080	
Mudun Ela (5) to (9)	m2	14.39	1,050	15,110	790	0	11,936,505	0
Mudun Ela retarding basins	m2	-	-	361,989	790	0	285,971,310	0
Mudun Ela Sub-basin subotal (upstream)				377,099			297,907,815	
Mudun Ela Sub-basin subotal				409,617			1,579,124,895	0
Total				552,186			4,892,168,114	0

Source: JICA Study Team

Table 21 Compensation Cost for the Kalu Oya and Mudun Ela Basin Improvement (M/P)

Description	Compensation price (LC, LKR)	Compensation price (FC, LKR)
Kalu Oya	12,456,400	0
Kalu Oya 2	1,705,184	0
Natha Canal	1,138,434	0
Old Dutch Canal+Diversion	124,795,620	0
Kalu Oya Basin Total	140,095,638	0
Mudun Ela Sub-basin Total	7,770,736	0
Total	147,866,374	0

Kalu Oya							
ID	Structure area (m2)	Affected area (m2)	Affected rate (%)	Compensation unit price (LC, LKR/m2)	Compensation unit price (FC, LKR/m3)	Compensation price (LC, LKR)	Compensation price (FC, LKR)
1	55.90	51.07	91%	2,200	0	122,980	0
2	90.59	9.32	10%	2,200	0	199,298	0
3	15.26	15.26	100%	2,200	0	33,572	0
4	16.30	16.30	100%	2,200	0	35,860	0
5	40.84	19.00	47%	2,200	0	89,848	0
6	25.40	25.40	100%	2,200	0	55,880	0
7	69.17	53.57	77%	2,200	0	152,174	0
8	59.70	57.87	97%	2,200	0	131,340	0
9	39.96	7.33	18%	2,200	0	87,912	0
10	42.20	42.20	100%	2,200	0	92,840	0
11	55.76	44.46	80%	2,200	0	122,672	0
12	53.21	33.13	62%	2,200	0	117,062	0
13	104.14	0.15	0%	2,200	0	330	0
14	36.94	13.32	36%	2,200	0	81,268	0
15	19.08	1.75	9%	2,200	0	3,850	0
16	22.95	0.26	1%	2,200	0	572	0
17	30.58	0.34	1%	2,200	0	748	0
18	24.11	2.39	10%	2,200	0	5,298	0
19	35.48	0.03	0%	2,200	0	66	0
20	24.55	1.19	5%	2,200	0	2,618	0
21	23.04	17.34	75%	2,200	0	50,688	0
22	115.12	115.12	100%	2,200	0	253,264	0
23	21.75	21.75	100%	2,200	0	47,850	0
24	14.13	14.13	100%	2,200	0	31,086	0
25	26.17	1.94	7%	2,200	0	4,268	0
26	39.04	28.19	72%	2,200	0	85,888	0
27	105.59	83.58	79%	2,200	0	232,298	0
28	17.29	17.29	100%	2,200	0	38,038	0
29	69.69	35.71	51%	2,200	0	153,318	0
30	30.48	16.65	55%	2,200	0	67,056	0
31	122.60	79.43	65%	2,200	0	269,720	0
32	57.09	56.60	99%	2,200	0	125,598	0
33	164.10	0.32	0%	2,200	0	704	0
34	88.26	76.82	87%	2,200	0	194,172	0
35	868.59	59.71	7%	2,200	0	131,362	0
36	108.13	62.02	57%	2,200	0	237,886	0
37	1,380.90	58.45	4%	2,200	0	128,590	0
38	1,450.29	1.80	0%	23,000	0	41,400	0
39	157.51	38.57	24%	23,000	0	3,622,730	0
40	88.34	10.50	12%	23,000	0	2,031,820	0
41	108.35	3.32	3%	23,000	0	76,360	0
42	49.69	8.41	17%	23,000	0	1,142,870	0
43	16.52	1.24	8%	23,000	0	28,520	0
44	14.14	3.15	22%	23,000	0	325,220	0
45	329.97	8.62	3%	23,000	0	198,260	0
46	638.48	49.67	8%	23,000	0	1,142,410	0
47	20.39	20.39	100%	2,200	0	44,858	0
48	426.95	6.30	1%	23,000	0	144,900	0
49	43.94	22.20	51%	2,200	0	96,668	0
50	50.52	5.58	11%	2,200	0	111,144	0
51	2,832.81	0.30	0%	2,200	0	660	0
52	3.70	1.26	34%	2,200	0	8,140	0
53	59.34	0.03	0%	2,200	0	66	0
54	155.03	2.28	1%	23,000	0	52,440	0
Subtotal						12,456,400	0

Kalu Oya 2							
ID	Structure area (m2)	Affected area (m2)	Affected rate (%)	Compensation unit price (LC, LKR/m2)	Compensation unit price (FC, LKR/m3)	Compensation price (LC, LKR)	Compensation price (FC, LKR)
55	108.64	7.01	6%	2,200	0	15,422	0
56	13.24	1.54	12%	2,200	0	29,128	0
57	13.35	7.41	56%	2,200	0	29,370	0
58	96.36	6.44	7%	2,200	0	14,168	0
59	268.19	9.79	4%	23,000	0	225,170	0
60	81.68	5.63	7%	23,000	0	129,490	0
61	410.74	18.49	5%	23,000	0	425,270	0
62	64.39	49.49	77%	2,200	0	141,658	0
63	43.27	27.81	64%	2,200	0	95,194	0
64	91.89	69.47	76%	2,200	0	202,158	0
65	53.87	10.85	20%	2,200	0	118,514	0
66	400.21	38.93	10%	2,200	0	85,646	0
67	51.61	17.06	33%	2,200	0	113,542	0
68	36.57	8.60	24%	2,200	0	80,454	0
Subtotal						1,705,184	0

Source: JICA Study Team

Table 22 Detailed Compensation Cost for the Kalu Oya and Mudun Ela Basin Improvement (M/P)

Natha

ID	Structure area (m2)	Affected area (m2)	Affected rate (%)	Compensation unit price (LC, LKR/m2)	Compensation unit price (FC, LKR/m3)	Compensation price (LC, LKR)	Compensation price (FC, LKR)
69	46.38	11.22	24%	2,200	0	102,036	0
70	24.09	23.78	99%	2,200	0	52,998	0
71	33.93	6.63	20%	2,200	0	74,646	0
72	290.66	50.63	17%	2,200	0	639,452	0
73	41.16	41.16	100%	2,200	0	90,552	0
74	22.97	22.97	100%	2,200	0	50,534	0
75	58.28	45.28	78%	2,200	0	128,216	0
Subtotal						1,138,434	0

Old Dutch + Old Dutch Diversion

ID	Structure area (m2)	Affected area (m2)	Affected rate (%)	Compensation unit price (LC, LKR/m2)	Compensation unit price (FC, LKR/m3)	Compensation price (LC, LKR)	Compensation price (FC, LKR)
76	2,273.20	1,009.81	44%	23,000	0	52,283,600	0
77	780.24	123.40	16%	23,000	0	17,945,520	0
78	65.19	0.36	1%	2,200	0	792	0
79	103.13	4.61	4%	2,200	0	10,142	0
80	98.90	63.40	64%	2,200	0	217,580	0
81	74.34	41.49	56%	2,200	0	163,548	0
82	221.99	79.19	36%	2,200	0	488,378	0
83	183.37	68.31	37%	2,200	0	403,414	0
84	153.28	6.38	4%	2,200	0	14,036	0
85	47.80	1.78	4%	2,200	0	3,916	0
86	62.76	0.58	1%	2,200	0	1,276	0
87	62.18	11.37	18%	2,200	0	136,796	0
88	179.92	177.92	99%	2,200	0	395,824	0
89	103.09	103.09	100%	2,200	0	226,798	0
90	164.47	164.47	100%	2,200	0	361,834	0
91	85.75	71.77	84%	2,200	0	188,650	0
92	59.38	22.58	38%	2,200	0	130,636	0
93	35.63	13.50	38%	2,200	0	78,386	0
94	10.89	10.89	100%	2,200	0	23,958	0
95	158.80	53.72	34%	23,000	0	3,652,400	0
96	247.38	4.75	2%	29,000	0	137,750	0
97	79.25	32.08	40%	2,200	0	174,350	0
98	44.66	41.26	92%	2,200	0	98,252	0
99	27.27	14.47	53%	2,200	0	59,994	0
100	25.84	25.84	100%	2,200	0	56,848	0
101	123.14	12.89	10%	2,200	0	270,908	0
102	234.17	139.51	60%	2,200	0	515,174	0
103	299.45	24.93	8%	2,200	0	54,846	0
104	1,337.23	154.61	12%	23,000	0	30,756,290	0
105	1,779.51	159.43	9%	23,000	0	3,666,890	0
106	333.56	43.66	13%	23,000	0	7,671,880	0
107	73.28	23.83	33%	2,200	0	161,216	0
108	35.78	27.74	78%	2,200	0	78,716	0
109	20.11	12.77	64%	2,200	0	44,242	0
110	170.41	100.64	59%	23,000	0	3,919,430	0
111	327.58	17.45	5%	23,000	0	401,350	0
Subtotal						124,795,620	0

Mudun Ela

ID	Structure area (m2)	Affected area (m2)	Affected rate (%)	Compensation unit price (LC, LKR/m2)	Compensation unit price (FC, LKR/m3)	Compensation price (LC, LKR)	Compensation price (FC, LKR)
112	35.64	20.00	56%	2,200	0	78,408	0
113	40.34	16.00	40%	2,200	0	88,748	0
114	36.20	7.80	22%	2,200	0	79,640	0
115	13.17	2.97	23%	2,200	0	28,974	0
116	30.52	2.98	10%	2,200	0	6,556	0
117	29.84	0.14	0%	2,200	0	308	0
118	942.05	71.56	8%	2,200	0	157,432	0
119	63.69	3.92	6%	23,000	0	90,160	0
120	116.96	116.96	100%	2,200	0	257,312	0
121	21.05	8.05	38%	2,200	0	46,310	0
122	54.36	39.87	73%	2,200	0	119,592	0
123	104.48	54.42	52%	23,000	0	2,403,040	0
124	315.53	78.78	25%	2,200	0	694,166	0
125	127.32	31.80	25%	2,200	0	280,104	0
126	29.40	29.40	100%	2,200	0	64,680	0
127	247.75	29.55	12%	2,200	0	545,050	0
128	179.70	56.53	31%	2,200	0	395,340	0
129	122.02	62.80	51%	2,200	0	268,444	0
130	186.52	41.57	22%	2,200	0	410,344	0
131	87.95	20.09	23%	2,200	0	193,490	0
132	114.60	27.61	24%	2,200	0	252,120	0
133	300.65	92.57	31%	2,200	0	661,430	0
134	33.12	26.59	80%	2,200	0	72,864	0
135	76.07	4.98	7%	2,200	0	10,956	0
136	71.78	36.12	50%	2,200	0	157,916	0
137	185.16	30.50	16%	2,200	0	407,352	0
Subtotal						7,770,736	0

Source: JICA Study Team

Table 23 Construction Cost for the Bolgoda Basin Improvement (M/P)

Total

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	181,944,695	87,403,712	269,348,407
Earth work	1,063,688,115	780,243,651	1,843,931,766
Gabion Wall	1,817,663,710	443,604,820	2,261,268,530
U-Ditch	277,418,928	96,860,448	374,279,376
Other Concrete Work	31,599,396	17,688,024	49,287,420
Road Work	192,153,404	84,995,310	277,148,714
Bridge Works	254,938,252	318,953,584	573,891,836
Gate works	1,432,099	5,728,395	7,160,494
Others	363,889,390	174,807,423	538,696,813
Total	4,184,727,989	2,010,285,367	6,195,013,356

B1

Weras Ganga Right Bank Dike

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	5,275,522	1,595,069	6,870,591
Earth work	47,665,946	17,823,222	65,489,168
Gabion Wall	0	0	0
U-Ditch	38,072,700	13,188,960	51,261,660
Other Concrete Work	0	0	0
Road Work	19,771,800	889,200	20,661,000
Bridge Works	0	0	0
Others	10,551,045	3,190,138	13,741,183
Total	121,337,013	36,686,589	158,023,602

B2

Maha Oya Protection

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	98,088,500	49,875,423	147,963,923
Earth Work	547,540,504	440,590,584	988,131,088
Gabion Wall	1,133,607,561	260,481,040	1,394,088,601
U-Ditch	125,639,488	43,847,760	169,487,248
Other Concrete Work	6,815,556	3,815,064	10,630,620
Road Work	99,313,070	53,358,780	152,671,850
Bridge Works	48,853,806	195,415,224	244,269,030
Others	196,176,999	99,750,845	295,927,844
Total	2,256,035,484	1,147,134,720	3,403,170,204

B4

Panape Ela Protection

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	12,292,379	3,654,607	15,946,986
Earth work	117,617,520	41,868,385	159,485,905
Gabion Wall	0	0	0
U-Ditch	84,402,560	29,252,688	113,655,248
Other Concrete Work	0	0	0
Road Work	43,827,490	1,971,060	45,798,550
Bridge Works	0	0	0
Others	24,584,757	7,309,213	31,893,970
Total	282,724,706	84,055,953	366,780,659

B3

Alut Ela Protection

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	64,516,528	31,472,781	95,989,309
Earth Work	336,142,391	274,265,930	610,408,321
Gabion Wall	684,056,149	183,123,780	867,179,929
U-Ditch	16,613,280	6,174,720	22,788,000
Other Concrete Work	24,783,840	13,872,960	38,656,800
Road Work	22,650,444	28,479,870	51,130,314
Bridge Works	206,084,446	123,538,360	329,622,806
Others	129,033,055	62,945,562	191,978,617
Total	1,483,880,133	723,873,963	2,207,754,096

B5

Maha Oya Tributaries Protection

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	1,771,768	805,832	2,577,600
Earth work	14,721,754	5,695,530	20,417,284
Gabion Wall	0	0	0
U-Ditch	12,690,900	4,396,320	17,087,220
Other Concrete Work	0	0	0
Road Work	6,590,600	296,400	6,887,000
Bridge Works	0	0	0
Gate works	1,432,099	5,728,395	7,160,494
Others	3,543,535	1,611,665	5,155,200
Total	40,750,656	18,534,142	59,284,798

Bolgoda Basin Improvement except for Weras Ganga Right Bank

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	176,669,173	85,808,643	262,477,816
Earth work	1,016,022,169	762,420,429	1,778,442,598
Gabion Wall	1,817,663,710	443,604,820	2,261,268,530
U-Ditch	239,346,228	83,671,488	323,017,716
Other Concrete Work	31,599,396	17,688,024	49,287,420
Road Work	172,381,604	84,106,110	256,487,714
Bridge Works	254,938,252	318,953,584	573,891,836
Gate works	1,432,099	5,728,395	7,160,494
Others	353,338,345	171,617,285	524,955,630
Total	4,063,390,976	1,973,598,778	6,036,989,754

Source: JICA Study Team

Table 24 Detailed Construction Cost for the Bolgoda Basin Improvement (1/6) (M/P)

Maha Oya (1)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	17.88	1,650	29,502	43	0	1,268,586	0
Dredging	m3	7.39	1,650	12,194	126	295	1,536,381	3,597,083
Excavation	m3	106.26	1,650	175,329	694	373	121,678,326	65,397,717
Backfill	m3	16.33	1,650	26,945	1,783	563	48,042,044	15,169,754
Disposal of soil (Bolgoda)	m3	96.96	1,650	159,984	320	745	51,194,880	119,188,080
Embankment	m3	0.36	1,650	594	641	640	380,754	380,160
Gabion with Rock	m3	24.00	1,650	39,600	9,651	1,838	382,179,600	72,784,800
Filter Cloths	m2	21.96	1,650	36,234	468	0	16,957,512	0
Gabion Foundation Rock	m3	6.13	1,650	10,115	5,097	1,522	51,553,607	15,394,269
Concrete for Top	m3	0.80	1,650	1,320	6,460	13,728	8,527,200	18,120,960
Formwork for Top	m2	1.80	1,650	2,970	2,384	24	7,080,480	71,280
Dowel Bar	m	1.60	1,650	2,640	498	408	1,314,720	1,077,120
Turf	m2	0.00	1,650	0	583	0	0	0
Concrete for U-ditch	m3	0.00	1,650	0	6,460	13,728	0	0
Formwork for U-ditch	m2	0.00	1,650	0	2,384	24	0	0
Gravel Bedding for U-ditch	m3	0.00	1,650	0	3,504	0	0	0
Concrete Pavement	m3	0.90	1,650	1,485	6,460	13,728	9,593,100	20,386,080
Base Course	m3	0.90	1,650	1,485	4,742	357	7,041,870	530,145

Maha Oya (2)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	30.33	1,800	54,594	43	0	2,347,542	0
Dredging	m3	13.34	1,800	24,012	126	295	3,025,512	7,083,540
Excavation	m3	49.39	1,800	88,902	694	373	61,697,988	33,160,446
Backfill	m3	0.60	1,800	1,080	1,783	563	1,925,640	608,040
Disposal of soil (Bolgoda)	m3	54.47	1,800	98,046	320	745	31,374,720	73,044,270
Embankment	m3	7.66	1,800	13,788	641	640	8,838,108	8,824,320
Gabion with Rock	m3	24.00	1,800	43,200	9,651	1,838	416,923,200	79,401,600
Filter Cloths	m2	21.96	1,800	39,528	468	0	18,499,104	0
Gabion Foundation Rock	m3	6.13	1,800	11,034	5,097	1,522	56,240,298	16,793,748
Concrete for Top	m3	0.80	1,800	1,440	6,460	13,728	9,302,400	19,768,320
Formwork for Top	m2	1.80	1,800	3,240	2,384	24	7,724,160	77,760
Dowel Bar	m	1.60	1,800	2,880	498	408	1,434,240	1,175,040
Turf	m2	0.00	1,800	0	583	0	0	0
Concrete for U-ditch	m3	0.11	1,800	198	6,460	13,728	1,279,080	2,718,144
Formwork for U-ditch	m2	1.40	1,800	2,520	2,384	24	6,007,680	60,480
Gravel Bedding for U-ditch	m3	0.03	1,800	54	3,504	0	189,216	0
Concrete Pavement	m3	0.90	1,800	1,620	6,460	13,728	10,465,200	22,239,360
Base Course	m3	0.90	1,800	1,620	4,742	357	7,682,040	578,340

Maha Oya (3)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	25.25	550	13,888	43	0	597,163	0
Dredging	m3	3.76	550	2,068	126	295	260,568	610,060
Excavation	m3	97.79	550	53,785	694	373	37,326,443	20,061,619
Backfill	m3	14.48	550	7,964	1,783	563	14,199,812	4,483,732
Disposal of soil (Bolgoda)	m3	82.03	550	45,117	320	745	14,437,280	33,611,793
Embankment	m3	5.04	550	2,772	641	640	1,776,852	1,774,080
Gabion with Rock	m3	24.00	550	13,200	9,651	1,838	127,393,200	24,261,600
Filter Cloths	m2	21.96	550	12,078	468	0	5,652,504	0
Gabion Foundation Rock	m3	6.13	550	3,372	5,097	1,522	17,184,536	5,131,423
Concrete for Top	m3	0.80	550	440	6,460	13,728	2,842,400	6,040,320
Formwork for Top	m2	1.80	550	990	2,384	24	2,360,160	23,760
Dowel Bar	m	1.60	550	880	498	408	438,240	359,040
Turf	m2	4.00	550	2,200	583	0	1,282,600	0
Concrete for U-ditch	m3	0.22	550	121	6,460	13,728	781,660	1,661,088
Formwork for U-ditch	m2	2.80	550	1,540	2,384	24	3,671,360	36,960
Gravel Bedding for U-ditch	m3	0.06	550	33	3,504	0	115,632	0
Concrete for Wall	m3	0.50	550	275	6,460	13,728	1,776,500	3,775,200
Formwork for Wall	m2	3.02	550	1,661	2,384	24	3,959,824	39,864
Gravel Bedding for Wall	m3	0.56	550	308	3,504	0	1,079,232	0
Concrete Pavement	m3	0.90	550	495	6,460	13,728	3,197,700	6,795,360
Base Course	m3	0.90	550	495	4,742	357	2,347,290	176,715

Source: JICA Study Team

Table 25 Detailed Construction Cost for the Bolgoda Basin Improvement (2/6) (M/P)

Alut Ela (1)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	16.94	1,370	23,208	43	0	997,936	0
Dredging	m3	6.52	1,370	8,938	126	295	1,126,173	2,636,675
Excavation	m3	72.94	1,370	99,926	694	373	69,348,943	37,272,559
Backfill	m3	15.43	1,370	21,139	1,783	563	37,691,016	11,901,314
Disposal of soil (Bolgoda)	m3	64.03	1,370	87,725	320	745	28,072,068	65,355,282
Embankment	m2	0.00	1,370	0	641	640	0	0
Gabion with Rock	m3	17.00	1,370	23,290	9,651	1,838	224,771,790	42,807,020
Filter Cloths	m2	14.58	1,370	19,975	468	0	9,348,113	0
Gabion Foundation Rock	m3	3.06	1,370	4,192	5,097	1,522	21,367,644	6,380,529
Concrete for Top	m3	1.29	1,370	1,767	6,460	13,728	11,416,758	24,261,495
Formwork for Top	m2	3.09	1,370	4,233	2,384	24	10,092,188	101,600
Dowel Bar	m	1.60	1,370	2,192	498	408	1,091,616	894,336
Turf	m	4.19	1,370	5,740	583	0	3,346,595	0
Concrete Pavement	m3	0.60	1,370	822	6,460	13,728	5,310,120	11,284,416
Base Course	m3	0.60	1,370	822	4,742	357	3,897,924	293,454

Alut Ela (2)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	23.00	2,000	46,000	43	0	1,978,000	0
Dredging	m3	5.88	2,000	11,760	126	295	1,481,760	3,469,200
Excavation	m3	67.67	2,000	135,340	694	373	93,925,960	50,481,820
Backfill	m3	14.63	2,000	29,260	1,783	563	52,170,580	16,473,380
Disposal of soil (Bolgoda)	m3	53.61	2,000	107,220	320	745	34,310,400	79,878,900
Embankment	m3	5.31	2,000	10,620	641	640	6,807,420	6,796,800
Gabion with Rock	m3	17.00	2,000	34,000	9,651	1,838	328,134,000	62,492,000
Filter Cloths	m2	14.58	2,000	29,160	468	0	13,646,880	0
Gabion Foundation Rock	m3	3.06	2,000	6,120	5,097	1,522	31,193,640	9,314,640
Concrete for Top	m3	1.29	2,000	2,580	6,460	13,728	16,666,800	35,418,240
Formwork for Top	m2	3.09	2,000	6,180	2,384	24	14,733,120	148,320
Dowel Bar	m	1.60	2,000	3,200	498	408	1,593,600	1,305,600
Turf	m2	4.19	2,000	8,380	583	0	4,885,540	0
Concrete for U-ditch	m3	0.22	2,000	440	6,460	13,728	2,842,400	6,040,320
Formwork for U-ditch	m2	2.80	2,000	5,600	2,384	24	13,350,400	134,400
Gravel Bedding for U-ditch	m3	0.06	2,000	120	3,504	0	420,480	0
Concrete for Wall	m3	0.50	2,000	1,000	6,460	13,728	6,460,000	13,728,000
Formwork for Wall	m2	3.02	2,000	6,040	2,384	24	14,399,360	144,960
Gravel Bedding for Wall	m3	0.56	2,000	1,120	3,504	0	3,924,480	0
Concrete Pavement	m3	0.60	2,000	1,200	6,460	13,728	7,752,000	16,473,600
Base Course	m3	0.60	2,000	1,200	4,742	357	5,690,400	428,400

Dike 1

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Site Clearing	m2		3,000	31,560	117	117	3,692,520	3,692,520
Cutting of top soil layer	m3		3,000	9,468	507	1,184	4,800,276	11,210,112
Excavation	m3		3,000	7,830	694	373	5,434,020	2,920,590
Backfill	m3		3,000	5,355	1,783	563	9,547,965	3,014,865
Disposal of soil (Bolgoda)	m3		3,000	0	320	745	0	0
Embankment	m3		3,000	21,222	641	640	13,603,302	13,582,080
Turf	m2		3,000	18,161	583	0	10,587,863	0
Concrete for U-ditch	m3		3,000	945	6,460	13,728	6,104,700	12,972,960
Formwork for U-ditch	m2		3,000	9,000	2,384	24	21,456,000	216,000
Gravel Bedding for U-ditch	m3		3,000	3,000	3,504	0	10,512,000	0
Compacted Pavement	m3		3,000	1,800	3,621	494	6,517,800	889,200
Kerb	m		3,000	3,000	4,418	0	13,254,000	0

Source: JICA Study Team

Table 26 Detailed Construction Cost for the Bolgoda Basin Improvement (3/6) (M/P)

Dike 2

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Site Clearing	m2		1,800	19,800	117	117	2,316,600	2,316,600
Cutting of top soil layer	m3		1,800	5,940	507	1,184	3,011,580	7,032,960
Excavation	m3		1,800	4,698	694	373	3,260,412	1,752,354
Backfill	m3		1,800	3,213	1,783	563	5,728,779	1,808,919
Disposal of soil (Bolgoda)	m3		1,800	0	320	745	0	0
Embankment	m3		1,800	14,625	641	640	9,374,625	9,360,000
Turf	m2		1,800	11,863	583	0	6,916,129	0
Concrete for U-ditch	m3		1,800	567	6,460	13,728	3,662,820	7,783,776
Formwork for U-ditch	m2		1,800	5,400	2,384	24	12,873,600	129,600
Gravel Bedding for U-ditch	m3		1,800	1,800	3,504	0	6,307,200	0
Compacted Pavement	m3		1,800	1,080	3,621	494	3,910,680	533,520
Kerb	m		1,800	1,800	4,418	0	7,952,400	0

Dike 3

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Site Clearing	m2		950	9,310	117	117	1,089,270	1,089,270
Cutting of top soil layer	m3		950	2,793	507	1,184	1,416,051	3,306,912
Excavation	m3		950	2,480	694	373	1,721,120	925,040
Backfill	m3		950	1,696	1,783	563	3,023,968	954,848
Disposal of soil (Bolgoda)	m3		950	0	320	745	0	0
Embankment	m3		950	5,325	641	640	3,413,325	3,408,000
Turf	m2		950	4,987	583	0	2,907,421	0
Concrete for U-ditch	m3		950	300	6,460	13,728	1,938,000	4,118,400
Formwork for U-ditch	m2		950	2,850	2,384	24	6,794,400	68,400
Gravel Bedding for U-ditch	m3		950	950	3,504	0	3,328,800	0
Compacted Pavement	m3		950	570	3,621	494	2,063,970	281,580
Kerb	m		950	950	4,418	0	4,197,100	0

Dike 4

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Site Clearing	m2		2,500	27,100	117	117	3,170,700	3,170,700
Cutting of top soil layer	m3		2,500	8,130	507	1,184	4,121,910	9,625,920
Excavation	m3		2,500	6,525	694	373	4,528,350	2,433,825
Backfill	m3		2,500	4,463	1,783	563	7,957,529	2,512,669
Disposal of soil (Bolgoda)	m3		2,500	0	320	745	0	0
Embankment	m3		2,500	19,421	641	640	12,448,861	12,429,440
Turf	m2		2,500	16,029	583	0	9,344,907	0
Concrete for U-ditch	m3		2,500	788	6,460	13,728	5,090,480	10,817,664
Formwork for U-ditch	m2		2,500	7,500	2,384	24	17,880,000	180,000
Gravel Bedding for U-ditch	m3		2,500	2,500	3,504	0	8,760,000	0
Compacted Pavement	m3		2,500	1,500	3,621	494	5,431,500	741,000
Kerb	m		2,500	2,500	4,418	0	11,045,000	0

Dike 5

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Site Clearing	m2		700	7,280	117	117	851,760	851,760
Cutting of top soil layer	m3		700	2,184	507	1,184	1,107,288	2,585,856
Excavation	m3		700	1,827	694	373	1,267,938	681,471
Backfill	m3		700	1,250	1,783	563	2,228,750	703,750
Disposal of soil (Bolgoda)	m3		700	0	320	745	0	0
Embankment	m3		700	4,774	641	640	3,060,134	3,055,360
Turf	m2		700	4,144	583	0	2,415,952	0
Concrete for U-ditch	m3		700	221	6,460	13,728	1,427,660	3,033,888
Formwork for U-ditch	m2		700	2,100	2,384	24	5,006,400	50,400
Gravel Bedding for U-ditch	m3		700	700	3,504	0	2,452,800	0
Compacted Pavement	m3		700	420	3,621	494	1,520,820	207,480
Kerb	m		700	700	4,418	0	3,092,600	0

Source: JICA Study Team

Table 27 Detailed Construction Cost for the Bolgoda Basin Improvement (4/6) (M/P)

Dike 6

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Site Clearing	m2		1,200	13,680	117	117	1,600,560	1,600,560
Cutting of top soil layer	m3		1,200	4,104	507	1,184	2,080,728	4,859,136
Excavation	m3		1,200	3,132	694	373	2,173,608	1,168,236
Backfill	m3		1,200	2,142	1,783	563	3,819,186	1,205,946
Disposal of soil (Bolgoda)	m3		1,200	0	320	745	0	0
Embankment	m3		1,200	10,854	641	640	6,957,414	6,946,560
Turf	m2		1,200	8,445	583	0	4,923,435	0
Concrete for U-ditch	m3		1,200	378	6,460	13,728	2,441,880	5,189,184
Formwork for U-ditch	m2		1,200	3,600	2,384	24	8,582,400	86,400
Gravel Bedding for U-ditch	m3		1,200	1,200	3,504	0	4,204,800	0
Compacted Pavement	m3		1,200	720	3,621	494	2,607,120	355,680
Kerb	m		1,200	1,200	4,418	0	5,301,600	0

Dike 7

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Site Clearing	m2		2,000	23,280	117	117	2,723,760	2,723,760
Cutting of top soil layer	m3		2,000	6,984	507	1,184	3,540,888	8,269,056
Excavation	m3		2,000	5,220	694	373	3,622,680	1,947,060
Backfill	m3		2,000	3,570	1,783	563	6,365,310	2,009,910
Disposal of soil (Bolgoda)	m3		2,000	0	320	745	0	0
Embankment	m3		2,000	19,233	641	640	12,328,353	12,309,120
Turf	m2		2,000	14,612	583	0	8,518,796	0
Concrete for U-ditch	m3		2,000	630	6,460	13,728	4,069,800	8,648,640
Formwork for U-ditch	m2		2,000	6,000	2,384	24	14,304,000	144,000
Gravel Bedding for U-ditch	m3		2,000	2,000	3,504	0	7,008,000	0
Compacted Pavement	m3		2,000	1,200	3,621	494	4,345,200	592,800
Kerb	m		2,000	2,000	4,418	0	8,836,000	0

Dike 8

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Site Clearing	m2		1,050	9,196	117	117	1,075,932	1,075,932
Cutting of top soil layer	m3		1,050	2,759	507	1,184	1,398,712	3,266,420
Excavation	m3		1,050	2,480	694	373	1,721,120	925,040
Backfill	m3		1,050	1,696	1,783	563	3,023,968	954,848
Disposal of soil (Bolgoda)	m3		1,050	0	320	745	0	0
Embankment	m3		1,050	5,105	641	640	3,272,305	3,267,200
Turf	m2		1,050	4,859	583	0	2,832,797	0
Concrete for U-ditch	m3		1,050	300	6,460	13,728	1,938,000	4,118,400
Formwork for U-ditch	m2		1,050	2,850	2,384	24	6,794,400	68,400
Gravel Bedding for U-ditch	m3		1,050	950	3,504	0	3,328,800	0
Compacted Pavement	m3		1,050	570	3,621	494	2,063,970	281,580
Kerb	m		1,050	950	4,418	0	4,197,100	0

Dike 9

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Site Clearing	m2		2,500	28,800	117	117	3,369,600	3,369,600
Cutting of top soil layer	m3		2,500	8,640	507	1,184	4,380,480	10,229,760
Excavation	m3		2,500	6,525	694	373	4,528,350	2,433,825
Backfill	m3		2,500	4,463	1,783	563	7,957,529	2,512,669
Disposal of soil (Bolgoda)	m3		2,500	0	320	745	0	0
Embankment	m3		2,500	23,322	641	640	14,949,402	14,926,080
Turf	m2		2,500	17,929	583	0	10,452,607	0
Concrete for U-ditch	m3		2,500	788	6,460	13,728	5,090,480	10,817,664
Formwork for U-ditch	m2		2,500	7,500	2,384	24	17,880,000	180,000
Gravel Bedding for U-ditch	m3		2,500	2,500	3,504	0	8,760,000	0
Compacted Pavement	m3		2,500	1,500	3,621	494	5,431,500	741,000
Kerb	m		2,500	2,500	4,418	0	11,045,000	0

Source: JICA Study Team

Table 28 Detailed Construction Cost for the Bolgoda Basin Improvement (5/6) (M/P)

Dike (B5)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Site Clearing	m2		1,000	10,000	117	117	1,170,000	1,170,000
Cutting of top soil layer	m3		1,000	3,000	507	1,184	1,521,000	3,552,000
Excavation	m3		1,000	2,610	694	373	1,811,340	973,530
Backfill	m3		1,000	1,785	1,783	563	3,182,655	1,004,955
Disposal of soil (Bolgoda)	m3		1,000	0	320	745	0	0
Embankment	m3		1,000	6,000	641	640	3,846,000	3,840,000
Turf	m2		1,000	5,473	583	0	3,190,759	0
Concrete for U-ditch	m3		1,000	315	6,460	13,728	2,034,900	4,324,320
Formwork for U-ditch	m2		1,000	3,000	2,384	24	7,152,000	72,000
Gravel Bedding for U-ditch	m3		1,000	1,000	3,504	0	3,504,000	0
Compacted Pavement	m3		1,000	600	3,621	494	2,172,600	296,400
Kerb	m		1,000	1,000	4,418	0	4,418,000	0

Thalpititiya Ela

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	12.04	2,850	34,314	43	0	1,475,502	0
Dredging	m3	0.00	2,850	0	126	295	0	0
Excavation	m3	37.33	2,850	106,391	694	373	73,835,007	39,683,657
Backfill	m3	14.64	2,850	41,724	1,783	563	74,393,892	23,490,612
Disposal of soil (Bolgoda)	m3	15.49	2,850	44,147	320	745	14,126,880	32,889,143
Embankment	m3	7.20	2,850	20,520	641	640	13,153,320	13,132,800
Gabion with Rock	m3	21.00	2,850	59,850	9,651	1,838	577,612,350	110,004,300
Filter Cloths	m2	10.50	2,850	29,925	468	0	14,004,900	0
Gabion Foundation Rock	m3	3.06	2,850	8,721	5,097	1,522	44,450,937	13,273,362
Concrete for Top	m3	0.46	2,850	1,311	6,460	13,728	8,469,060	17,997,408
Formwork for Top	m2	0.99	2,850	2,822	2,384	24	6,726,456	67,716
Dowel Bar	m	1.60	2,850	4,560	498	408	2,270,880	1,860,480
Turf	m2	3.64	2,850	10,374	583	0	6,048,042	0
Concrete for U-ditch	m3	0.11	2,850	314	6,460	13,728	2,025,210	4,303,728
Formwork for U-ditch	m2	1.40	2,850	3,990	2,384	24	9,512,160	95,760
Gravel Bedding for U-ditch	m3	0.03	2,850	86	3,504	0	299,592	0
Concrete Pavement	m3	0.90	2,850	2,565	6,460	13,728	16,569,900	35,212,320
Base Course	m3	0.90	2,850	2,565	4,742	357	12,163,230	915,705

Source: JICA Study Team

Table 29 Detailed Construction Cost for the Bolgoda Basin Improvement (6/6) (M/P)

Maha Oya (1)

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Bridge 1	m2	245	112,308	449,230	27,515,362	110,061,448

Maha Oya (2)

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Bridge 2	m3	190	112,308	449,230	21,338,444	85,353,776

Alut Ela 1

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Bridge 3	m2	125	112,308	449,230	14,038,450	56,153,800
Bridge 4	m2	150	112,308	449,230	16,846,140	67,384,560
Total	m3				30,884,590	123,538,360

Alut Ela 2

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Bridge 5	m2	110	112,308	449,230	12,353,836	49,415,344

Alut Ela 3

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Bridge 6	m2	280	112,308	449,230	31,446,128	125,784,512

sample information of bridge construction under SLLDC

$$10.4 \text{ (m)} \times 40 \text{ (m)} = 416 \text{ (m}^2\text{)} = 233.6 \text{ million LKR}$$

$$1 \text{ (m}^2\text{)} = 561,538 \text{ LKR}$$

Assuming that the local portion to the foreign portion of the bridge construction is at 2 to 8.

Table 32 Quantity of the Surrounding Dike in the Bolgoda Basin (3/10) (M/P)

Rough Quantity and Cost Estimation of Surrounding Dike 3

Description	Unit	Quantity
Site clearing	m2	9,310
Cutting of top soil layer	m3	2,793
Excavation	m3	2,480
Backfill	m3	1,696
Disposal of excavated material (35km)	m3	0
Embankment	m3	5,325
Turf	m2	4,987
Concrete for U-ditch	m3	300
Formwork for U-ditch	m2	2,850
Gravel Bedding for U-ditch	m3	950
Compacted pavement	m3	570
Kerb	m	950
Total		

The average height of the protective diking system:

Dike crown width:
Pavement width:
Slope of dike
Length of dike



Quantities per section

Width of clearing: $4 + 0.95 \times 2 \times 2 = 9.80$ m
 Embankment: $(4 \times 2 + 0.95 \times 2 \times 2) \times 0.95 / 2 = 5.61$ m²
 Turf: $(\sqrt{0.95^2 + (0.95 \times 2)^2} + 0.5) \times 2 = 5.25$ m
 Compacted pavement (t=200mm): $3 \times 0.2 = 0.60$ m²

Quantities for U ditch (0.6m x 0.6m) per section

Excavation: 2.61 m²
 Backfill: 1.785 m²
 Concrete: 0.315 m²
 Formworks: 3.00 m
 Gravel bedding: 1.00 m²



Calculation of average dike height

Station	Distance (m)	Ground Elevation (m)	Dike Elevation (m)	Dike Height (m)	Dike Area (m ²)	Volume (m ³)
0	-	1.683	3	1.32	8.73	-
50	50	1.600	3	1.40	9.52	456.45
100	50	1.542	3	1.46	10.08	490.18
150	50	1.894	3	1.11	6.87	423.86
200	50	2.296	3	0.70	3.81	266.93
250	50	1.943	3	1.06	6.46	256.67
300	50	1.843	3	1.16	7.31	344.18
350	50	2.282	3	0.72	3.90	280.17
400	50	2.208	3	0.79	4.42	208.04
450	50	2.374	3	0.63	3.29	192.72
500	50	2.769	3	0.23	1.03	107.90
550	50	1.756	3	1.24	8.07	227.54
600	50	1.785	3	1.22	7.82	397.20
650	50	2.060	3	0.94	5.53	333.64
700	50	1.839	3	1.16	7.34	321.70
750	50	2.451	3	0.55	2.80	253.38
800	50	2.362	3	0.64	3.37	154.11
850	50	2.077	3	0.92	5.40	219.09
900	50	2.196	3	0.80	4.51	247.59
950	50	2.591	3	0.41	1.97	161.98
Total	950					5,343.31

Average volume area (V not 0) $5343 / 950 = 5.62$ m²

Since the volume of the dike is described as follows,

$$Vave = (4 \times 2 + H_{ave} \times 2 \times 2) \times H_{ave} / 2 \times 1 = 4H_{ave} + 2H_{ave}^2$$

the average height would be

Have = m
 check Vave = m²
 OK

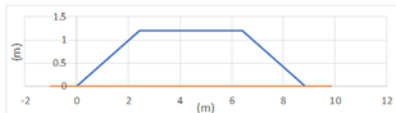
Table 33 Quantity of the Surrounding Dike in the Bolgoda Basin (4/10) (M/P)

Rough Quantity and Cost Estimation of Surrounding Dike 4

Description	Unit	Quantity
Site clearing	m2	27,100
Cutting of top soil layer	m3	8,130
Excavation	m3	6,525
Backfill	m3	4,463
Disposal of excavated material (35km)	m3	0
Embankment	m3	19,421
Turf	m2	16,029
Concrete for U-ditch	m3	788
Formwork for U-ditch	m2	7,500
Gravel Bedding for U-ditch	m3	2,500
Compacted pavement	m3	1,500
Kerb	m	2,500
Total		

The average height of the protective diking system:

Dike crown width:
Pavement width:
Slope of dike
Length of dike



Quantities per section

Width of clearing: $4 + 1.21 \times 2 \times 2 = 10.84$ m
 Embankment: $(4 \times 2 + 1.21 \times 2 \times 2) \times 1.21 / 2 = 7.77$ m²
 Turf: $(\sqrt{1.21^2 + (1.21 \times 2)^2} + 0.5) \times 2 = 6.41$ m
 Compacted pavement (t=200mm): $3 \times 0.2 = 0.60$ m²

Quantities for U ditch (0.6m x 0.6m) per section

Excavation: 2.61 m²
 Backfill: 1.785 m²
 Concrete: 0.315 m²
 Formworks: 3.00 m
 Gravel bedding: 1.00 m²



Calculation of average dike height

Station	Distance (m)	Ground Elevation (m)	Dike Elevation (m)	Dike Height (m)	Dike Area (m ²)	Volume (m ³)
0	-	8.573	5.00	0.00	0.00	-
100	100	4.229	5.08	0.85	4.84	242.24
200	100	3.938	5.16	1.22	7.87	635.77
300	100	4.043	5.24	1.20	7.69	777.87
400	100	4.042	5.33	1.29	8.46	807.57
500	100	4.130	5.41	1.28	8.41	843.88
600	100	4.228	5.49	1.27	8.27	834.11
700	100	4.326	5.58	1.26	8.19	822.86
800	100	4.449	5.66	1.21	7.80	799.56
900	100	4.566	5.75	1.18	7.52	765.99
1000	100	4.351	5.83	1.48	10.25	888.43
1100	100	4.420	5.91	1.49	10.41	1,033.28
1200	100	4.888	5.99	1.11	6.86	863.88
1300	100	4.776	6.08	1.30	8.59	772.77
1400	100	4.761	6.16	1.40	9.52	905.50
1500	100	5.041	6.25	1.21	7.75	863.27
1600	100	5.062	6.33	1.27	8.31	802.72
1700	100	5.186	6.41	1.23	7.91	810.64
1800	100	5.027	6.50	1.47	10.21	905.69
1900	100	5.778	6.58	0.80	4.47	734.17
2000	100	6.534	6.66	0.13	0.55	251.47
2100	100	4.993	6.75	1.75	13.17	686.00
2200	100	5.479	6.83	1.35	9.08	1,112.41
2300	100	5.633	6.91	1.28	8.40	874.21
2400	100	5.533	7.00	1.46	10.13	926.72
2500	100	7.686	7.06	0.00	0.00	506.65
Total	2,500					19,467.65

Average volume area (V not 0) $19468 / 2500 = 7.79$ m²

Since the volume of the dike is described as follows,

$$Vave = (4 \times 2 + H_{ave} \times 2 \times 2) \times H_{ave} / 2 \times 1 = 4H_{ave} + 2H_{ave}^2$$

the average height would be

Have = m
 check Vave = m²
 OK

Table 34 Quantity of the Surrounding Dike in the Bolgoda Basin (5/10) (M/P)

Rough Quantity and Cost Estimation of Surrounding Dike 5

Description	Unit	Quantity
Site clearing	m2	7,280
Cutting of top soil layer	m3	2,184
Excavation	m3	1,827
Backfill	m3	1,250
Disposal of excavated material (35km)	m3	0
Embankment	m3	4,774
Turf	m2	4,144
Concrete for U-ditch	m3	221
Formwork for U-ditch	m2	2,100
Gravel Bedding for U-ditch	m3	700
Compacted pavement	m3	420
Kerb	m	700
Total		

The average height of the protective diking system:

- Dike crown width: 1.1 m
- Pavement width: 4.0 m
- Slope of dike: 3.0 m
- Length of dike: 2.0 to 1.0
- 700 m



Quantities per section

- Width of clearing: $4 + 1.1 \times 2 \times 2 = 2 = 10.40 \text{ m}$
- Embankment: $(4 \times 2 + 1.1 \times 2 \times 2) \times 1.1 / 2 = 6.82 \text{ m}^2$
- Turf: $(\text{sqrt}(1.1^2 + (1.1 \times 2)^2) + 0.5) \times 2 = 5.92 \text{ m}$
- Compacted pavement (t=200mm): $3 \times 0.2 = 0.60 \text{ m}^2$

Quantities for U ditch (0.6m x 0.6m) per section

- Excavation: 2.61 m²
- Backfill: 1.785 m²
- Concrete: 0.315 m²
- Formworks: 3.00 m
- Gravel bedding: 1.00 m²



Calculation of average dike height

Station	Distance (m)	Ground Elevation (m)	Dike Elevation (m)	Dike Height (m)	Dike Area (m ²)	Volume (m ³)
0	-	6.887	7.00	0.11	0.48	-
50	50	5.384	7.00	1.62	11.68	304.01
100	50	5.358	7.00	1.64	11.96	591.11
150	50	5.847	7.00	1.15	7.27	480.91
200	50	5.248	7.00	1.75	13.15	510.52
250	50	6.099	7.00	0.90	5.23	459.44
300	50	6.822	7.00	0.18	0.77	150.12
350	50	5.668	7.00	1.33	8.88	241.29
400	50	5.788	7.00	1.21	7.78	416.51
450	50	5.889	7.00	1.11	6.91	367.34
500	50	6.349	7.00	0.65	3.45	259.12
550	50	5.819	7.00	1.18	7.51	274.21
600	50	6.032	7.00	0.97	5.74	331.43
650	50	6.218	7.00	0.78	4.35	252.34
700	50	6.660	7.00	0.34	1.59	148.54
Total	700					4,786.87

Average volume area (V not 0) $4787 / 700 = 6.84 \text{ m}^2$

Since the volume of the dike is described as follows,

$$\text{Vave} = (4 \times 2 + \text{Have} \times 2 \times 2) \times \text{Have} / 2 \times 1 = 4\text{Have} + 2\text{Have}^2$$

the average height would be

Have = 1.10 m
 check Vave = 6.82 m²
 OK

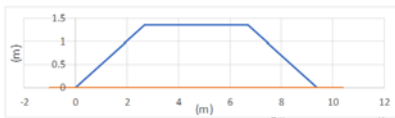
Table 35 Quantity of the Surrounding Dike in the Bolgoda Basin (6/10) (M/P)

Rough Quantity and Cost Estimation of Surrounding Dike 6

Description	Unit	Quantity
Site clearing	m2	13,680
Cutting of top soil layer	m3	4,104
Excavation	m3	3,132
Backfill	m3	2,142
Disposal of excavated material (35km)	m3	0
Embankment	m3	10,854
Turf	m2	8,445
Concrete for U-ditch	m3	378
Formwork for U-ditch	m2	3,600
Gravel Bedding for U-ditch	m3	1,200
Compacted pavement	m3	720
Kerb	m	1,200
Total		

The average height of the protective diking system:

- Dike crown width: 1.4 m
- Pavement width: 4.0 m
- Slope of dike: 3.0 m
- Length of dike: 2.0 to 1.0
- 1,200 m



Quantities per section

- Width of clearing: $4 + 1.35 \times 2 \times 2 = 2 = 11.40 \text{ m}$
- Embankment: $(4 \times 2 + 1.35 \times 2 \times 2) \times 1.35 / 2 = 9.05 \text{ m}^2$
- Turf: $(\text{sqrt}(1.35^2 + (1.35 \times 2)^2) + 0.5) \times 2 = 7.04 \text{ m}$
- Compacted pavement (t=200mm): $3 \times 0.2 = 0.60 \text{ m}^2$

Quantities for U ditch (0.6m x 0.6m) per section

- Excavation: 2.61 m²
- Backfill: 1.785 m²
- Concrete: 0.315 m²
- Formworks: 3.00 m
- Gravel bedding: 1.00 m²



Calculation of average dike height

Station	Distance (m)	Ground Elevation (m)	Dike Elevation (m)	Dike Height (m)	Dike Area (m ²)	Volume (m ³)
0	-	1.769	2.50	0.73	3.99	-
50	50	1.375	2.50	1.13	7.03	275.64
100	50	1.553	2.50	0.95	5.58	315.34
150	50	1.175	2.50	1.32	8.81	359.76
200	50	0.939	2.50	1.56	11.11	498.07
250	50	0.752	2.50	1.75	13.10	605.41
300	50	0.652	2.50	1.85	14.23	683.25
350	50	0.859	2.50	1.64	11.96	654.57
400	50	1.014	2.50	1.49	10.36	557.89
450	50	0.998	2.50	1.50	10.52	521.98
500	50	1.344	2.50	1.16	7.30	445.48
550	50	1.068	2.50	1.43	9.83	428.31
600	50	1.539	2.50	0.96	5.69	388.11
650	50	1.110	2.50	1.39	9.43	378.00
700	50	1.327	2.50	1.17	7.44	421.76
750	50	1.758	2.50	0.74	4.07	287.85
800	50	1.639	2.50	0.86	4.93	224.94
850	50	1.472	2.50	1.03	6.22	278.70
900	50	1.748	2.50	0.75	4.14	259.03
950	50	0.746	2.50	1.75	13.17	432.80
1000	50	0.690	2.50	1.81	13.79	674.14
1050	50	0.728	2.50	1.77	13.36	678.88
1100	50	1.003	2.50	1.50	10.47	595.70
1150	50	0.969	2.50	1.53	10.81	531.88
1200	50	1.992	2.50	0.51	2.55	333.87
Total	1,200					10,831.40

Average volume area (V not 0) $10831 / 1200 = 9.03 \text{ m}^2$

Since the volume of the dike is described as follows,

$$\text{Vave} = (4 \times 2 + \text{Have} \times 2 \times 2) \times \text{Have} / 2 \times 1 = 4\text{Have} + 2\text{Have}^2$$

the average height would be

Have = 1.35 m
 check Vave = 9.05 m²
 OK

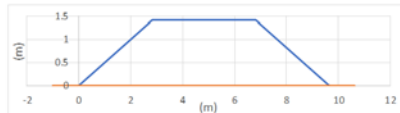
Table 36 Quantity of the Surrounding Dike in the Bolgoda Basin (7/10) (M/P)

Rough Quantity and Cost Estimation of Surrounding Dike 7

Description	Unit	Quantity
Site clearing	m2	23,280
Cutting of top soil layer	m3	6,984
Excavation	m3	5,220
Backfill	m3	3,570
Disposal of excavated material (35km)	m3	0
Embankment	m3	19,233
Turf	m2	14,612
Concrete for U-ditch	m3	630
Formwork for U-ditch	m2	6,000
Gravel Bedding for U-ditch	m3	2,000
Compacted pavement	m3	1,200
Kerb	m	2,000
Total		

The average height of the protective diking system:

- Dike crown width: 1.4 m
- Pavement width: 4.0 m
- Slope of dike: 3.0 m
- Length of dike: 2.0 to 1.0
- Length of dike: 2,000 m



Quantities per section

- Width of clearing: $4 + 1.41 \times 2 \times 2 =$ 11.64 m
- Embankment: $(4 \times 2 + 1.41 \times 2 \times 2) \times 1.41 / 2 =$ 9.62 m²
- Turf: $(\text{sqrt}(1.41^2 + (1.41 \times 2)^2) + 0.5) \times 2 =$ 7.31 m
- Compacted pavement (t=200mm): $3 \times 0.2 =$ 0.60 m²

Quantities for U ditch (0.6m x 0.6m) per section

- Excavation: 2.61 m²
- Backfill: 1.785 m²
- Concrete: 0.315 m²
- Formworks: 3.00 m
- Gravel bedding: 1.00 m²



Calculation of average dike height

Station	Distance (m)	Ground Elevation (m)	Dike Elevation (m)	Dike Height (m)	Dike Area (m ²)	Volume (m ³)
0	-	1.257	2.50	1.24	8.06	-
100	100	1.062	2.50	1.44	9.89	897.26
200	100	1.916	2.50	0.58	3.02	645.37
300	100	0.965	2.50	1.53	10.85	693.64
400	100	1.070	2.50	1.43	9.81	1,033.05
500	100	1.138	2.50	1.36	9.16	948.28
600	100	1.003	2.50	1.50	10.47	981.49
700	100	1.121	2.50	1.38	9.32	989.55
800	100	1.082	2.50	1.42	9.70	950.69
900	100	1.104	2.50	1.40	9.48	958.95
1000	100	1.186	2.50	1.31	8.71	909.67
1100	100	0.952	2.50	1.55	10.99	984.99
1200	100	1.582	2.50	0.92	5.36	817.36
1300	100	1.087	2.50	1.41	9.64	750.06
1400	100	1.008	2.50	1.49	10.42	1,003.10
1500	100	1.017	2.50	1.48	10.33	1,037.35
1600	100	0.800	2.50	1.70	12.58	1,145.50
1700	100	0.771	2.50	1.73	12.90	1,273.94
1800	100	0.971	2.50	1.53	10.79	1,184.37
1900	100	1.066	2.50	1.43	9.85	1,031.98
2000	100	1.061	2.50	1.44	9.89	987.13
Total	2,000					19,223.73

Average volume area (V not 0) $19224 / 2000 =$ 9.61 m²

Since the volume of the dike is described as follows,

$$V_{ave} = (4 \times 2 + H_{ave} \times 2 \times 2) \times H_{ave} / 2 \times 1 = 4H_{ave} + 2H_{ave}^2$$

the average height would be

Have = 1.41 m
 check Vave = 9.62 m²
 OK

Table 37 Quantity of the Surrounding Dike in the Bolgoda Basin (8/10) (M/P)

Rough Quantity and Cost Estimation of Surrounding Dike 8

Description	Unit	Quantity
Site clearing	m2	9,196
Cutting of top soil layer	m3	2,759
Excavation	m3	2,480
Backfill	m3	1,696
Disposal of excavated material (35km)	m3	0
Embankment	m3	5,105
Turf	m2	4,859
Concrete for U-ditch	m3	300
Formwork for U-ditch	m2	2,850
Gravel Bedding for U-ditch	m3	950
Compacted pavement	m3	570
Kerb	m	950
Total		

The average height of the protective diking system:

- Dike crown width: 0.9 m
- Pavement width: 4.0 m
- Slope of dike: 3.0 m
- Length of dike: 2.0 to 1.0
- Length of dike: 950 m



Quantities per section

- Width of clearing: $4 + 0.92 \times 2 \times 2 =$ 9.68 m
- Embankment: $(4 \times 2 + 0.92 \times 2 \times 2) \times 0.92 / 2 =$ 5.37 m²
- Turf: $(\text{sqrt}(0.92^2 + (0.92 \times 2)^2) + 0.5) \times 2 =$ 5.11 m
- Compacted pavement (t=200mm): $3 \times 0.2 =$ 0.60 m²

Quantities for U ditch (0.6m x 0.6m) per section

- Excavation: 2.61 m²
- Backfill: 1.785 m²
- Concrete: 0.315 m²
- Formworks: 3.00 m
- Gravel bedding: 1.00 m²



Calculation of average dike height

Station	Distance (m)	Ground Elevation (m)	Dike Elevation (m)	Dike Height (m)	Dike Area (m ²)	Volume (m ³)
0	-	1.404	2.50	1.10	6.79	-
50	50	1.301	2.50	1.20	7.67	361.42
100	50	1.361	2.50	1.14	7.15	370.37
150	50	1.616	2.50	0.88	5.10	306.23
200	50	1.531	2.50	0.97	5.76	271.47
250	50	1.024	2.50	1.48	10.26	400.48
300	50	2.329	2.50	0.17	0.74	275.15
350	50	1.218	2.50	1.28	8.42	229.06
400	50	1.571	2.50	0.93	5.44	346.44
450	50	3.297	2.50	0.00	0.00	135.96
500	50	1.195	2.50	1.31	8.63	215.66
550	50	1.081	2.50	1.42	9.70	458.16
600	50	1.740	2.50	0.76	4.20	347.40
650	50	0.862	2.50	1.64	11.92	402.96
700	50	1.151	2.50	1.35	9.03	523.92
750	50	3.709	2.50	0.00	0.00	225.87
800	50	3.727	2.50	0.00	0.00	0.00
850	50	2.141	2.50	0.36	1.70	42.41
900	50	2.106	2.50	0.39	1.89	89.63
950	50	2.379	2.50	0.12	0.51	60.08
1000	50	2.508	2.50	0.00	0.00	12.86
1050	50	3.002	2.50	0.00	0.00	0.00
Total	1,050					5,075.51

Average volume area (V not 0) $5076 / 950 =$ 5.34 m²

Since the volume of the dike is described as follows,

$$V_{ave} = (4 \times 2 + H_{ave} \times 2 \times 2) \times H_{ave} / 2 \times 1 = 4H_{ave} + 2H_{ave}^2$$

the average height would be

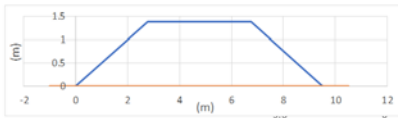
Have = 0.92 m
 check Vave = 5.37 m²
 OK

Table 38 Quantity of the Surrounding Dike in the Bolgoda Basin (9/10) (M/P)

Rough Quantity and Cost Estimation of Surrounding Dike 9

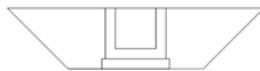
Description	Unit	Quantity
Site clearing	m2	28,800
Cutting of top soil layer	m3	8,640
Excavation	m3	6,525
Backfill	m3	4,463
Disposal of excavated material (35km)	m3	0
Embankment	m3	23,322
Turf	m2	17,929
Concrete for U-ditch	m3	788
Formwork for U-ditch	m2	7,500
Gravel Bedding for U-ditch	m3	2,500
Compacted pavement	m3	1,500
Kerb	m	2,500
Total		

The average height of the protective diking system: 1.4 m
 Dike crown width: 4.0 m
 Pavement width: 3.0 m
 Slope of dike: 2.0 to 1.0
 Length of dike: 2,500 m



Quantities per section
 Width of clearing: $4 + 1.38 \times 2 \times 2 = 11.52$ m
 Embankment: $(4 \times 2 + 1.38 \times 2 \times 2) \times 1.38 / 2 = 9.33$ m2
 Turf: $(\sqrt{1.38^2 + (1.38 \times 2)^2} + 0.5) \times 2 = 7.17$ m
 Compacted pavement (t=200mm): $3 \times 0.2 = 0.60$ m2

Quantities for U ditch (0.6m x 0.6m) per section
 Excavation: 2.61 m2
 Backfill: 1.785 m2
 Concrete: 0.315 m2
 Formworks: 3.00 m
 Gravel bedding: 1.00 m2



Calculation of average dike height

Station	Distance (m)	Ground Elevation (m)	Dike Elevation (m)	Dike Height (m)	Dike Area (m2)	Volume (m3)
0	-	2.093	2.50	0.41	1.96	-
100	100	1.028	2.50	1.47	10.22	608.84
200	100	1.348	2.50	1.15	7.26	873.76
300	100	0.845	2.50	1.65	12.10	967.78
400	100	2.887	2.50	0.00	0.00	604.87
500	100	0.992	2.50	1.51	10.58	529.06
600	100	0.820	2.50	1.68	12.36	1,147.23
700	100	1.243	2.50	1.26	8.19	1,027.78
800	100	0.988	2.50	1.51	10.62	940.71
900	100	1.533	2.50	0.97	5.74	817.86
1000	100	0.720	2.50	1.78	13.46	959.83
1100	100	0.726	2.50	1.77	13.39	1,342.70
1200	100	0.593	2.50	1.91	14.91	1,414.97
1300	100	1.244	2.50	1.26	8.18	1,154.17
1400	100	1.177	2.50	1.32	8.79	848.34
1500	100	0.670	2.50	1.83	14.01	1,140.23
1600	100	2.705	2.50	0.00	0.00	700.72
1700	100	0.898	2.50	1.60	11.54	577.02
1800	100	0.741	2.50	1.76	13.23	1,238.51
1900	100	0.984	2.50	1.52	10.66	1,194.58
2000	100	1.208	2.50	1.29	8.50	958.24
2100	100	0.709	2.50	1.79	13.58	1,104.02
2200	100	1.212	2.50	1.29	8.47	1,102.22
2300	100	0.966	2.50	1.53	10.84	965.36
2400	100	1.627	2.50	0.87	5.02	792.90
2500	100	2.336	2.50	0.16	0.71	286.35
Total	2,500					23,298.04

Average volume area (V not 0) $23298 / 2500 = 9.32$ m2

Since the volume of the dike is described as follows,

$Vave = (4 \times 2 + Have \times 2 \times 2) \times Have / 2 \times 1 = 4Have + 2Have^2$

the average height would be

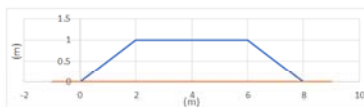
Have = 1.38 m
 check Vave = 9.33 m2
 OK

Table 39 Quantity of the Surrounding Dike in the Bolgoda Basin (10/10) (M/P)

Rough Quantity of Surrounding Dike (B5)

Description	Unit	Quantity
Site clearing	m2	10,000
Cutting of top soil layer	m3	3,000
Excavation	m3	2,610
Backfill	m3	1,785
Disposal of excavated material (35km)	m3	0
Embankment	m3	6,000
Turf	m2	5,473
Concrete for U-ditch	m3	315
Formwork for U-ditch	m2	3,000
Gravel Bedding for U-ditch	m3	1,000
Compacted pavement	m3	600
Kerb	m	1,000
Total		

The average height of the protective diking system: 1.0 m
 Dike crown width: 4.0 m
 Pavement width: 3.0 m
 Slope of dike: 2.0 to 1.0
 Length of dike: 1,000 m



Quantities per section
 Width of clearing: $4 + 1 \times 2 \times 2 = 10.00$ m
 Embankment: $(4 \times 2 + 1 \times 2 \times 2) \times 1 / 2 = 6.00$ m2
 Turf: $(\sqrt{1^2 + (1 \times 2)^2} + 0.5) \times 2 = 5.47$ m
 Compacted pavement (t=200mm): $3 \times 0.2 = 0.60$ m2

Quantities for U ditch (0.6m x 0.6m) per section
 Excavation: 2.61 m2
 Backfill: 1.785 m2
 Concrete: 0.315 m2
 Formworks: 3.00 m
 Gravel bedding: 1.00 m2



Cost for 4 gates (1m x 1m x 4 gates)

Area of gate: 4 m2
 Cost: 7,160,494 LKR
 Reference: 64.8 m2 116,000,000 LKR

Table 40 Land Acquisition and Compensation Cost for the Bolgoda Basin Improvement (M/P)

Land Acquisition and Compensation for Bolgoda Basin

Description	Cost LC (LKR)	Cost FC (LKR)
Land Acquisition	2,592,658,976	0
Affected building compensation	35,239,471	0
Land acquisition for resettlement	0	0
Total	2,627,898,447	0

*Source: JICA Study Team***Table 41 Land Acquisition Cost for the Bolgoda Basin Improvement (1/2) (M/P)**

Land Acquisition

Description	Unit	Quantity (m)	from (m)	to (m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Weras Ganga Right Bank Dike (Dike 1)	m2					23,125	-	0	645,187,936	0
Weras Ganga Right Bank Dike subtotal						23,125			645,187,936	
Maha Oya (1)	m2	17.88	5+550	6+200	650	11,622	390	0	4,532,580	0
Maha Oya (1)	m2	17.88	8+000	9+000	1,000	17,880	390	0	6,973,200	0
Maha Oya (2)	m2	30.33	6+200	8+000	1,800	54,594	390	0	21,291,660	0
Maha Oya (3)	m2	25.25	9+000	9+550	550	13,888	390	0	5,416,125	0
Maha Oya subtotal						97,984			38,213,565	
Alut Ela (1)-1	m2	10.91	5+590	6+000	410	4,473	39,400	0	176,240,140	0
Alut Ela (1)-2	m2	10.91	8+000	8+960	960	10,474	39,400	0	412,659,840	0
Alut Ela (2)	m2	15.80	6+000	8+000	2,000	31,600	39,400	0	1,245,040,000	0
Alut Ela subtotal						46,547			1,833,939,980	
Dike (2)	m2	8.55	0+000	1+800	1,800	15,390	590	0	9,080,100	0
Dike (3)	m2	8.27	0+000	0+950	950	7,857	590	0	4,635,335	0
Dike (4)	m2	28.83	0+000	2+500	2,500	72,075	390	0	28,109,250	0
Dike (5)	m2	10.95	0+000	0+700	700	7,665	390	0	2,989,350	0
Dike (6)	m2	4.19	0+000	1+200	1,200	5,028	390	0	1,960,920	0
Dike (7)	m2	20.65	0+000	2+000	2,000	41,300	390	0	16,107,000	0
Dike (8)	m2	9.88	0+000	0+950	950	9,386	390	0	3,660,540	0
Dike (9)	m2	9.00	0+000	2+500	2,500	22,500	390	0	8,775,000	0
Protective Dike Subsystem subtotal						181,201			75,317,495	
Bolgoda Basin total						348,856			2,839,634,936	0

Source: JICA Study Team

Table 42 Land Acquisition Cost for the Bolgoda Basin Improvement (2/2) (M/P)

Weras Ganga Right Bank Dike (Dike 1)

Description	Unit	Quantity	Unit Price	Unit Price	Cost	Cost
			LC (LKR/)	FC (LKR/)	LC (LKR)	FC (LKR)
Weras Ganga Right Bank Dike (Dike 1)	m2	6,615	39,400	0	260,645,815	0
		405	39,400	0	15,972,524	0
		518	39,400	0	20,407,349	0
		175	39,400	0	6,884,205	0
		668	39,400	0	26,334,291	0
		75	39,400	0	2,940,659	0
		8	39,400	0	308,621	0
		119	39,400	0	4,684,188	0
		998	39,400	0	39,318,600	0
		159	15,000	0	2,391,855	0
		510	15,000	0	7,645,185	0
		228	15,000	0	3,421,845	0
		248	15,000	0	3,724,635	0
		28	15,000	0	426,300	0
		345	15,000	0	5,170,575	0
		74	15,000	0	1,112,190	0
		921	15,000	0	13,813,500	0
		695	15,000	0	10,432,140	0
		567	15,000	0	8,500,575	0
		198	39,400	0	7,807,032	0
		1,303	15,000	0	19,544,355	0
		2	15,000	0	28,920	0
		486	15,000	0	7,293,450	0
		728	15,000	0	10,913,025	0
		706	15,000	0	10,593,810	0
		676	15,000	0	10,141,350	0
		1,460	15,000	0	21,899,145	0
		2,269	39,400	0	89,409,199	0
		177	39,400	0	6,992,043	0
		975	15,000	0	14,618,295	0
787	15,000	0	11,812,260	0		
Total		23,125			645,187,936	

Source: JICA Study Team

Table 43 Unit Price List (1/2) (M/P)

Unit Price List

Description	Unit	Price Composition		Unit Price				Remarks
		LC	FC	Total	w/ indirect	LC	FC	
Backfill	LKR/m3	76%	24%	2,005	2,346	1,783	563	indirect cost: 17%
Base Course	LKR/m3	93%	7%	4,358	5,099	4,742	357	
Canal Bank Clearing	LKR/m2	100%	0%	37	43	43	0	
Compacted Pavement	LKR/m3	88%	12%	3,517	4,115	3,621	494	
Concrete for Parapet Wall	LKR/m3	32%	68%	17,255	20,188	6,460	13,728	
Concrete for Top	LKR/m3	32%	68%	17,255	20,188	6,460	13,728	
Concrete for U-ditch	LKR/m3	32%	68%	17,255	20,188	6,460	13,728	
Concrete for Wall	LKR/m3	32%	68%	17,255	20,188	6,460	13,728	
Concrete for Stone Masonry	LKR/m3	32%	68%	17,255	20,188	6,460	13,728	
Concrete Pavement	LKR/m3	32%	68%	17,255	20,188	6,460	13,728	
Base Concrete for Stone Masonry	LKR/m3	32%	68%	17,255	20,188	6,460	13,728	
Lean Concrete for Stone Masonry	LKR/m3	32%	68%	17,255	20,188	6,460	13,728	
Coping Concrete (incl. formwork)	LKR/m	47%	53%	15,460	18,088	8,501	9,587	
Cutting of Top Soil Layer	LKR/m3	30%	70%	1,445	1,691	507	1,184	
Disposal of soil (Kalu Oya)	LKR/m3	30%	70%	533	624	187	437	15km distance
Disposal of soil (Bolgoda)	LKR/m3	30%	70%	910	1,065	320	745	35km distance
Dowel Bar	LKR/m	55%	45%	774	906	498	408	
Dredging	LKR/m3	30%	70%	360	421	126	295	
Embankment	LKR/m3	50%	50%	1,095	1,281	641	640	
Excavation	LKR/m3	65%	35%	912	1,067	694	373	
Filter Cloths	LKR/m2	100%	0%	400	468	468	0	
Formwork for Parapet Wall	LKR/m2	99%	1%	2,058	2,408	2,384	24	
Formwork for Top	LKR/m2	99%	1%	2,058	2,408	2,384	24	
Formwork for U-ditch	LKR/m2	99%	1%	2,058	2,408	2,384	24	
Formwork for Wall	LKR/m2	99%	1%	2,058	2,408	2,384	24	
Formwork for Stone Masonry	LKR/m2	99%	1%	2,058	2,408	2,384	24	
Gabion Foundation Rock	LKR/m3	77%	23%	5,657	6,619	5,097	1,522	
Gabion with Rock	LKR/m3	84%	16%	9,820	11,489	9,651	1,838	
Gravel Bedding for U-ditch	LKR/m3	100%	0%	2,995	3,504	3,504	0	
Gravel Bedding for Wall	LKR/m3	100%	0%	2,995	3,504	3,504	0	
Gravel for Stone Masonry	LKR/m3	100%	0%	2,995	3,504	3,504	0	
Kerb	LKR/m	100%	0%	3,776	4,418	4,418	0	
Riprap	LKR/m3	100%	0%	4,735	5,540	5,540	0	
Site Clearing	LKR/m2	50%	50%	200	234	117	117	
Supply and Installation of SSP	LKR/m2	16%	84%	38,564	45,120	7,219	37,901	
Turf	LKR/m2	100%	0%	498	583	583	0	
Rock for stone masonry	LKR/m3	100%	0%	2,844	3,328	3,328	0	

Source: Unit Price Analysis Sheet from SLLDC in 2019

Table 44 Unit Price List (2/2) (M/P)

Description	Labor		Equipment		Material		Total		Ratio	
	LC	FC	LC	FC	LC	FC	LC	FC	LC	FC
Backfill	3,600.00	0.00	589.50	1,375.50	108.00	0.00	4,297.50	1,375.50	76%	24%
Base Course	5,400.00	0.00	123,680.00	30,920.00	275,780.37	0.00	404,860.37	30,920.00	93%	7%
Canal Bank Clearing	1,854.00	0.00	0.00	0.00	0.00	0.00	1,854.00	0.00	100%	0%
Compacted Pavement	1,800.00	0.00	496.20	1,157.80	6,500.00	0.00	8,796.20	1,157.80	88%	12%
Concrete for Parapet Wall	7,200.00	0.00	0.00	0.00	8,498.84	33,131.38	15,698.84	33,131.38	32%	68%
Concrete for Top	7,200.00	0.00	0.00	0.00	8,498.84	33,131.38	15,698.84	33,131.38	32%	68%
Concrete for U-ditch	7,200.00	0.00	0.00	0.00	8,498.84	33,131.38	15,698.84	33,131.38	32%	68%
Concrete for Wall	7,200.00	0.00	0.00	0.00	8,498.84	33,131.38	15,698.84	33,131.38	32%	68%
Concrete for Stone Masonry	7,200.00	0.00	0.00	0.00	8,498.84	33,131.38	15,698.84	33,131.38	32%	68%
Concrete Pavement	7,200.00	0.00	0.00	0.00	8,498.84	33,131.38	15,698.84	33,131.38	32%	68%
Base Concrete for Stone Masonry	7,200.00	0.00	0.00	0.00	8,498.84	33,131.38	15,698.84	33,131.38	32%	68%
Lean Concrete for Stone Masonry	7,200.00	0.00	0.00	0.00	8,498.84	33,131.38	15,698.84	33,131.38	32%	68%
Coping Concrete (incl. formwork)	-	-	-	-	-	-	-	-	47%	53%
Cutting of Top Soil Layer	0.00	0.00	43,350.00	101,150.00	0.00	0.00	43,350.00	101,150.00	30%	70%
Disposal of soil (Kalu Oya)	0.00	0.00	159.81	372.88	0.00	0.00	159.81	372.88	30%	70%
Disposal of soil (Bolgoda)	0.00	0.00	272.88	636.72	0.00	0.00	272.88	636.72	30%	70%
Dowel Bar	2,150.00	0.00	0.00	0.00	299.38	2,039.52	2,449.38	2,039.52	55%	45%
Dredging	0.00	0.00	107.69	251.27	0.00	0.00	107.69	251.27	30%	70%
Embankment	900.00	0.00	660.00	1,540.00	0.00	0.00	1,560.00	1,540.00	50%	50%
Excavation	450.00	0.00	138.75	323.75	0.00	0.00	588.75	323.75	65%	35%
Filter Cloths	1,800.00	0.00	0.00	0.00	2,986.20	0.00	4,786.20	0.00	100%	0%
Formwork for Parapet Wall	1,500.00	0.00	0.00	0.00	1,350.78	17.60	2,850.78	17.60	99%	1%
Formwork for Top	1,500.00	0.00	0.00	0.00	1,350.78	17.60	2,850.78	17.60	99%	1%
Formwork for U-ditch	1,500.00	0.00	0.00	0.00	1,350.78	17.60	2,850.78	17.60	99%	1%
Formwork for Wall	1,500.00	0.00	0.00	0.00	1,350.78	17.60	2,850.78	17.60	99%	1%
Formwork for Stone Masonry	1,500.00	0.00	0.00	0.00	1,350.78	17.60	2,850.78	17.60	99%	1%
Gabion Foundation Rock	4,300.00	0.00	1,593.00	3,717.00	6,400.00	0.00	12,293.00	3,717.00	77%	23%
Gabion with Rock	7,900.00	0.00	3,330.00	7,770.00	30,099.88	0.00	41,329.88	7,770.00	84%	16%
Gravel Bedding for U-ditch	1,875.00	0.00	0.00	0.00	87,990.00	0.00	89,865.00	0.00	100%	0%
Gravel Bedding for Wall	1,875.00	0.00	0.00	0.00	87,990.00	0.00	89,865.00	0.00	100%	0%
Gravel for Stone Masonry	1,875.00	0.00	0.00	0.00	87,990.00	0.00	89,865.00	0.00	100%	0%
Kerb					5,924.00		5,924.00	0.00	100%	0%
Riprap	7,900.00	0.00	0.00	0.00	5,500.00	0.00	13,400.00	0.00	100%	0%
Site Clearing	5,400.00	0.00	4,320.00	10,080.00	162.00	0.00	9,882.00	10,080.00	50%	50%
Supply and Installation of SSP	-	-	-	-	-	-	-	-	16%	84%
Turf	1,575.00	0.00	0.00	0.00	3,047.25	0.00	4,622.25	0.00	100%	0%
Rock for stone masonry	636.04	0.00	0.00	0.00	2,208.00	0.00	2,844.04	0.00	100%	0%

Source: Unit Price Analysis Sheet from SLLDC in 2019

Supply and Installation of SSP (12m, 8nos)	Labor		Equipment		Material		Total		Ratio	
	LC	FC	LC	FC	LC	FC	LC	FC	LC	FC
SSP			3,000.00	7,000.00	100,800.00	907,200.00	103,800.00	914,200.00	10%	90%
allow					2,400.00	21,600.00	2,400.00	21,600.00	10%	90%
Labor	5,400.00						5,400.00	0.00	100%	0%
Boom Trk			4,500.00	10,500.00			4,500.00	10,500.00	30%	70%
Labor	3,600.00						3,600.00	0.00	100%	0%
Excavator			8,880.00	20,720.00			8,880.00	20,720.00	30%	70%
Labor	2,500.00						2,500.00	0.00	100%	0%
Labor	7,200.00						7,200.00	0.00	100%	0%
Tool					291.00		291.00	0.00	100%	0%
Grease					656.00	2,624.00	656.00	2,624.00	20%	80%
Excavator w/ barge			12,120.00	28,280.00			12,120.00	28,280.00	30%	70%
Vibrator w/ cut and weld			16,800.00	39,200.00			16,800.00	39,200.00	30%	70%
Labor	10,800.00						10,800.00	0.00	100%	0%
Painter	10,000.00						10,000.00	0.00	100%	0%
Labor	8,000.00						8,000.00	0.00	100%	0%
Labor	7,200.00						7,200.00	0.00	100%	0%
Tool					756.00		756.00	0.00	100%	0%
Primer					10,905.60	98,150.40	10,905.60	98,150.40	10%	90%
Finisher					25,958.40	103,833.60	25,958.40	103,833.60	20%	80%
Total	54,700.00	0.00	45,300.00	105,700.00	141,767.00	1,133,408.00	241,767.00	1,239,108.00	16%	84%

Coping Concrete (incl. formwork)	Labor		Equipment		Material		Total		Ratio	
	LC	FC	LC	FC	LC	FC	LC	FC	LC	FC
Concrete							5,087.92	10,811.84	32%	68%
Formwork							8,883.15	89.73	99%	1%
Reinforcement					604.48	5,440.28	604.48	5,440.28	10%	90%
Total	0.00	0.00	0.00	0.00	604.48	5,440.28	14,575.55	16,341.85	47%	53%

Source: Unit Price Analysis Sheet from SLLDC in 2019

Table 45 Construction Cost for the Mudun Ela Sub-basin Improvement direct construction Cost (Pre-F/S)

1) Package 1 (Drainage Channel improvement)

Mudun Ela (downstream, 10yr)

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	18,880,904	15,723,646	34,604,550
Earth work	74,860,597	55,728,014	130,588,611
Sheet Pile Work	30,519,035	139,588,877	170,107,912
Gabion Wall	210,158,399	76,967,027	287,125,426
Parapet Wall	1,840,291	940,914	2,781,205
U-Ditch	20,002,395	7,434,367	27,436,762
Other Concrete Work	24,052,720	13,463,709	37,516,429
Road Work	16,184,651	20,350,012	36,534,663
Others	37,761,809	31,447,292	69,209,101
Total	434,260,801	361,643,858	795,904,659

2) Package 2 (Gates and Pumping station)

Naranmini Oya gate and Natha Canal gate

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	694,105	2,319,601	3,013,706
Gate works	6,709,383	26,837,531	33,546,914
Pump Station Improvement	7,172,720	19,554,480	26,727,200
Others	1,388,210	4,639,201	6,027,411
Total	15,964,418	53,350,813	69,315,231

3) Package 3 (Bridges)

Three bridges

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	1,959,768	7,839,071	9,798,839
Bridge Works	39,195,353	156,781,410	195,976,763
Others	3,919,535	15,678,141	19,597,676
Total	45,074,656	180,298,622	225,373,278

4) Total

Mudun Ela (downstream, 10yr), gates, pumping station and bridges

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	21,534,777	25,882,317	47,417,094
Earth work	74,860,597	55,728,014	130,588,611
Sheet Pile Work	30,519,035	139,588,877	170,107,912
Gabion Wall	210,158,399	76,967,027	287,125,426
Parapet Wall	1,840,291	940,914	2,781,205
U-Ditch	20,002,395	7,434,367	27,436,762
Other Concrete Work	24,052,720	13,463,709	37,516,429
Road Work	16,184,651	20,350,012	36,534,663
Bridge Works	39,195,353	156,781,410	195,976,763
Gate works	6,709,383	26,837,531	33,546,914
Pump Station Improvement	7,172,720	19,554,480	26,727,200
Others	43,069,554	51,764,634	94,834,188
Total	495,299,875	595,293,292	1,090,593,167

Reference: Shortcut layout

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	14,647,187	32,433,882	47,081,069
Earth work	54,047,018	40,933,303	94,980,321
Sheet Pile Work	81,297,735	371,842,017	453,139,752
Gabion Wall	80,775,603	29,856,285	110,631,888
Parapet Wall	4,904,653	2,511,580	7,416,233
U-Ditch	14,225,126	5,287,108	19,512,234
Other Concrete Work	278,819	156,071	434,890
Road Work	11,510,056	14,472,340	25,982,396
Bridge Works	39,195,353	156,781,410	195,976,763
Gate works	6,709,383	26,837,531	33,546,914
Others	29,294,375	64,867,765	94,162,140
Total	336,885,308	745,979,292	1,082,864,600

Source: JICA Study Team

Table 46 Detailed Construction Cost for the Mudun Ela Sub-basin Improvement (1/4) (Pre-F/S)

Mudun Ela (1)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	11.24	45	505.80	43	0	21,750	0
Dredging	m3	6.76	45	304.20	126	295	38,330	89,739
Excavation	m3	6.79	45	305.55	694	373	212,052	113,971
Backfill	m3	2.23	45	100.35	1,783	563	178,925	56,498
Disposal of soil (Kalu Oya)	m3	3.81	45	171.45	187	437	32,062	74,924
Embankment	m3	7.51	45	337.95	641	640	216,626	216,288
Supply and Installation of SSP	m2	6.00	45	270.00	7,219	37,901	1,949,130	10,233,270
Coping Concrete (incl. formwork)	m	1.00	45	45.00	8,501	9,587	382,545	431,415
Concrete for Parapet Wall	m3	0.11	45	4.95	6,460	13,728	31,977	67,954
Formwork for Parapet Wall	m2	1.00	45	45.00	2,384	24	107,280	1,080
Gabion with Rock	m3	3.50	45	157.50	9,651	1,838	1,520,033	289,485
Filter Cloths	m2	4.73	45	212.85	468	0	99,614	0
Gabion Foundation Rock	m3	1.75	45	78.75	5,097	1,522	401,389	119,858
Concrete for Top	m3	0.75	45	33.75	6,460	13,728	218,025	463,320
Formwork for Top	m2	1.38	45	62.10	2,384	24	148,047	1,491
Dowel Bar	m	0.80	45	36.00	498	408	17,928	14,688
Turf	m2	2.01	45	90.45	583	0	52,733	0
Concrete for U-ditch	m3	0.22	45	9.90	6,460	13,728	63,954	135,908
Formwork for U-ditch	m2	2.80	45	126.00	2,384	24	300,384	3,024
Gravel Bedding for U-ditch	m3	0.06	45	2.70	3,504	0	9,461	0
Concrete for Wall	m3	0.25	45	11.25	6,460	13,728	72,675	154,440
Formwork for Wall	m2	1.51	45	67.95	2,384	24	161,993	1,631
Gravel Bedding for Wall	m3	0.28	45	12.60	3,504	0	44,151	0
Concrete Pavement	m3	0.60	45	27.00	6,460	13,728	174,420	370,656
Base Course	m3	0.60	45	27.00	4,742	357	128,034	9,639

Mudun Ela (2)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	9.28	225	2,088.00	43	0	89,784	0
Dredging	m3	22.80	225	5,130.00	126	295	646,380	1,513,350
Excavation	m3	0.87	225	196.75	694	373	135,851	73,015
Backfill	m3	0.64	225	144.00	1,783	563	256,752	81,072
Disposal of soil (Kalu Oya)	m3	18.30	225	4,117.50	187	437	769,973	1,799,348
Embankment	m3	4.73	225	1,064.25	641	640	682,185	681,120
Turf	m2	7.17	225	1,613.25	583	0	940,525	0
Concrete for U-ditch	m3	0.11	225	24.75	6,460	13,728	159,885	339,768
Formwork for U-ditch	m2	1.40	225	315.00	2,384	24	750,960	7,560
Gravel Bedding for U-ditch	m3	0.03	225	6.75	3,504	0	23,652	0
Concrete Pavement	m3	0.30	225	67.50	6,460	13,728	436,050	926,640
Base Course	m3	0.30	225	67.50	4,742	357	320,085	24,098

Mudun Ela (3)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	17.97	1,563	28,087.11	43	0	1,207,746	0
Dredging	m3	7.52	1,563	11,753.76	126	295	1,480,974	3,467,360
Excavation	m3	16.58	1,563	25,914.54	694	373	17,984,691	9,666,124
Backfill	m3	5.30	1,563	8,283.90	1,783	563	14,770,194	4,663,836
Disposal of soil (Kalu Oya)	m3	11.37	1,563	17,771.31	187	437	3,323,235	7,766,063
Embankment	m3	7.43	1,563	11,613.09	641	640	7,443,991	7,432,378
Gabion with Rock	m3	7.00	1,563	10,941.00	9,651	1,838	105,591,591	20,109,558
Filter Cloths	m2	9.46	1,563	14,785.98	468	0	6,919,839	0
Gabion Foundation Rock	m3	3.51	1,563	5,486.13	5,097	1,522	27,962,805	8,349,890
Concrete for Top	m3	1.50	1,563	2,344.50	6,460	13,728	15,145,470	32,185,296
Formwork for Top	m2	2.75	1,563	4,298.25	2,384	24	10,247,028	103,158
Dowel Bar	m	1.60	1,563	2,500.80	498	408	1,245,399	1,020,327
Turf	m2	4.01	1,563	6,267.63	583	0	3,654,029	0
Concrete for U-ditch	m3	0.22	1,563	343.86	6,460	13,728	2,221,336	4,720,511
Formwork for U-ditch	m2	2.80	1,563	4,376.40	2,384	24	10,433,338	105,034
Gravel Bedding for U-ditch	m3	0.06	1,563	93.78	3,504	0	328,606	0
Concrete for Wall	m3	0.50	1,563	781.50	6,460	13,728	5,048,490	10,728,432
Formwork for Wall	m2	3.02	1,563	4,720.26	2,384	24	11,253,100	113,287
Gravel Bedding for Wall	m3	0.56	1,563	875.28	3,504	0	3,066,982	0
Concrete Pavement	m3	0.60	1,563	937.80	6,460	13,728	6,058,188	12,874,119
Base Course	m3	0.60	1,563	937.80	4,742	357	4,447,048	334,795

Source: JICA Study Team

Table 47 Detailed Construction Cost for the Mudun Ela Sub-basin Improvement (2/4) (Pre-F/S)

Mudun Ela (4)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	6.84	711	4,863.24	43	0	209,120	0
Dredging	m3	14.72	711	10,465.92	126	295	1,318,706	3,087,447
Excavation	m3	7.97	711	5,666.67	694	373	3,932,669	2,113,668
Backfill	m3	2.84	711	2,019.24	1,783	563	3,600,305	1,136,833
Disposal of soil (Kalu Oya)	m3	9.67	711	6,875.37	187	437	1,285,695	3,004,537
Embankment	m3	3.67	711	2,609.37	641	640	1,672,607	1,669,997
Gabion with Rock	m3	3.50	711	2,488.50	9,651	1,838	24,016,514	4,573,863
Filter Cloths	m2	4.73	711	3,363.03	468	0	1,573,899	0
Gabion Foundation Rock	m3	1.76	711	1,251.36	5,097	1,522	6,378,182	1,904,570
Concrete for Top	m3	0.75	711	533.25	6,460	13,728	3,444,795	7,320,456
Formwork for Top	m2	2.75	711	1,955.25	2,384	24	4,661,316	46,926
Dowel Bar	m	1.60	711	1,137.60	498	408	566,525	464,141
Turf	m2	2.26	711	1,606.86	583	0	936,800	0
Concrete for U-ditch	m3	0.11	711	78.21	6,460	13,728	505,237	1,073,667
Formwork for U-ditch	m2	1.40	711	995.40	2,384	24	2,373,034	23,890
Gravel Bedding for U-ditch	m3	0.03	711	21.33	3,504	0	74,741	0
Concrete for Wall	m3	0.25	711	177.75	6,460	13,728	1,148,265	2,440,152
Formwork for Wall	m2	1.51	711	1,073.61	2,384	24	2,559,487	25,767
Gravel Bedding for Wall	m3	0.28	711	199.08	3,504	0	697,577	0
Concrete Pavement	m3	0.30	711	213.30	6,460	13,728	1,377,918	2,928,183
Base Course	m3	0.30	711	213.30	4,742	357	1,011,469	76,149

Mudun Ela (5)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	14.91	272	4,055.52	43	0	174,388	0
Dredging	m3	11.99	272	3,261.28	126	295	410,922	962,078
Excavation	m3	18.56	272	5,048.32	694	373	3,503,535	1,883,024
Backfill	m3	1.55	272	421.60	1,783	563	751,713	237,361
Disposal of soil (Kalu Oya)	m3	17.00	272	4,624.00	187	437	864,688	2,020,688
Supply and Installation of SSP	m2	12.00	272	3,264.00	7,219	37,901	23,562,816	123,708,864
Coping Concrete (incl. formwork)	m	2.00	272	544.00	8,501	9,587	4,624,544	5,215,328
Concrete for Parapet Wall	m3	0.23	272	62.56	6,460	13,728	404,138	858,824
Formwork for Parapet Wall	m2	2.00	272	544.00	2,384	24	1,296,896	13,056
Concrete for U-ditch	m3	0.22	272	59.84	6,460	13,728	386,567	821,484
Formwork for U-ditch	m2	2.80	272	761.60	2,384	24	1,815,655	18,279
Gravel Bedding for U-ditch	m3	0.06	272	16.32	3,504	0	57,186	0
Concrete Pavement	m3	0.60	272	163.20	6,460	13,728	1,054,272	2,240,410
Base Course	m3	0.60	272	163.20	4,742	357	773,895	58,263

Mudun Ela (L1)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	11.74	120	1,408.80	43	0	60,579	0
Dredging	m3	0.00	120	0.00	126	295	0	0
Excavation	m3	0.89	120	106.80	694	373	74,120	39,837
Backfill	m3	0.66	120	79.20	1,783	563	141,214	44,590
Disposal of soil (Kalu Oya)	m3	18.30	120	2,196.00	187	437	410,652	959,652
Embankment	m3	11.37	120	1,364.40	641	640	874,581	873,216
Turf	m2	7.14	120	856.80	583	0	499,515	0
Concrete for U-ditch	m3	0.11	120	13.20	6,460	13,728	85,272	181,210
Formwork for U-ditch	m2	1.40	120	168.00	2,384	24	400,512	4,032
Gravel Bedding for U-ditch	m3	0.03	120	3.60	3,504	0	12,615	0
Concrete Pavement	m3	0.30	120	36.00	6,460	13,728	232,560	494,208
Base Course	m3	0.30	120	36.00	4,742	357	170,712	12,852

Source: JICA Study Team

Table 48 Detailed Construction Cost for the Mudun Ela Sub-basin Improvement (3/4) (Pre-F/S)

Shortcut only

Mudun Ela (S-1)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	14.59	493	7,192.87	43	0	309,294	0
Dredging	m3	6.63	493	3,268.59	126	295	411,843	964,235
Excavation	m3	11.83	493	5,832.19	694	373	4,047,540	2,175,407
Backfill	m3	4.83	493	2,381.19	1,783	563	4,245,662	1,340,610
Disposal of soil (Kalu Oya)	m3	7.35	493	3,623.55	187	437	677,604	1,583,492
Embankment	m3	6.28	493	3,096.04	641	640	1,984,562	1,981,466
Gabion with Rock	m3	7.00	493	3,451.00	9,651	1,838	33,305,601	6,342,938
Filter Cloths	m2	9.46	493	4,663.78	468	0	2,182,650	0
Gabion Foundation Rock	m3	3.51	493	1,730.43	5,097	1,522	8,820,002	2,633,715
Concrete for Top	m3	1.50	493	739.50	6,460	13,728	4,777,170	10,151,856
Formwork for Top	m2	2.75	493	1,355.75	2,384	24	3,232,108	32,538
Dowel Bar	m	1.60	493	788.80	498	408	392,823	321,831
Turf	m2	3.90	493	1,922.70	583	0	1,120,935	0
Concrete for U-ditch	m3	0.22	493	108.46	6,460	13,728	700,652	1,488,939
Formwork for U-ditch	m2	2.80	493	1,380.40	2,384	24	3,290,874	33,130
Gravel Bedding for U-ditch	m3	0.06	493	29.58	3,504	0	103,649	0
Concrete Pavement	m3	0.60	493	295.80	6,460	13,728	1,910,868	4,060,743
Base Course	m3	0.60	493	295.80	4,742	357	1,402,684	105,601

Mudun Ela (S-2)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	9.71	490	4,757.90	43	0	204,590	0
Dredging	m3	0.00	490	0.00	126	295	0	0
Excavation	m3	34.10	490	16,709.00	694	373	11,596,046	6,232,457
Backfill	m3	1.41	490	690.90	1,783	563	1,231,875	388,977
Disposal of soil (Kalu Oya)	m3	20.69	490	10,138.10	187	437	1,895,825	4,430,350
Embankment	m3	0.13	490	63.70	641	640	40,832	40,768
Supply and Installation of SSP	m2	12.00	490	5,880.00	7,219	37,901	42,447,720	222,857,880
Coping Concrete (incl. formwork)	m	2.00	490	980.00	8,501	9,587	8,330,980	9,395,260
Concrete for Parapet Wall	m3	0.23	490	112.70	6,460	13,728	728,042	1,547,146
Formwork for Parapet Wall	m2	2.00	490	980.00	2,384	24	2,336,320	23,520
Concrete for U-ditch	m3	0.22	490	107.80	6,460	13,728	696,388	1,479,879
Formwork for U-ditch	m2	2.80	490	1,372.00	2,384	24	3,270,848	32,928
Gravel Bedding for U-ditch	m3	0.06	490	29.40	3,504	0	103,018	0
Concrete Pavement	m3	0.60	490	294.00	6,460	13,728	1,899,240	4,036,032
Base Course	m3	0.60	490	294.00	4,742	357	1,394,148	104,958

Mudun Ela (S-3)

Description	Unit	Quantity (/m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	15.08	240	3,619.20	43	0	155,626	0
Dredging	m3	0.00	240	0.00	126	295	0	0
Excavation	m3	49.38	240	11,851.20	694	373	8,224,733	4,420,498
Backfill	m3	6.10	240	1,464.00	1,783	563	2,610,312	824,232
Disposal of soil (Kalu Oya)	m3	37.29	240	8,949.60	187	437	1,673,576	3,910,976
Embankment	m3	5.99	240	1,437.60	641	640	921,502	920,064
Gabion with Rock	m3	7.00	240	1,680.00	9,651	1,838	16,213,680	3,087,840
Filter Cloths	m2	9.46	240	2,270.40	468	0	1,062,548	0
Gabion Foundation Rock	m3	3.51	240	842.40	5,097	1,522	4,293,713	1,282,133
Concrete for Top	m3	1.50	240	360.00	6,460	13,728	2,325,600	4,942,080
Formwork for Top	m2	2.75	240	660.00	2,384	24	1,573,440	15,840
Dowel Bar	m	1.60	240	384.00	498	408	191,232	156,672
Turf	m2	4.68	240	1,123.20	583	0	654,826	0
Concrete for U-ditch	m3	0.22	240	52.80	6,460	13,728	341,088	724,839
Formwork for U-ditch	m2	2.80	240	672.00	2,384	24	1,602,048	16,128
Gravel Bedding for U-ditch	m3	0.06	240	14.40	3,504	0	50,458	0
Concrete Pavement	m3	0.60	240	144.00	6,460	13,728	930,240	1,976,832
Base Course	m3	0.60	240	144.00	4,742	357	682,848	51,408

Source: JICA Study Team

Table 49 Detailed Construction Cost for the Mudun Ela Sub-basin Improvement (4/4) (Pre-F/S)

Mudun Ela

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Bridge 1	m2	230	112,308	449,230	25,830,748	103,322,992
Bridge 2	m2	166	112,308	449,230	18,643,062	74,572,247
Bridge 3	m2	119	112,308	449,230	13,364,605	53,458,418
Total	m2				39,195,353	156,781,410

sample information of bridge construction under SLLDC

$$10.4 \text{ (m)} \times 40 \text{ (m)} = 416 \text{ (m}^2\text{)} = 233.6 \text{ million LKR}$$

$$1 \text{ (m}^2\text{)} = 561,538 \text{ LKR}$$

Assuming that the local portion to the foreign portion of the bridge construction is at 2 to 8.

Peliyagoda Pumping Station Improvement

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Procurement of equipment (Pump, etc)	LS	1	2,172,720	19,554,480	2,172,720	19,554,480
Installation	LS	1	5,000,000	0	5,000,000	0
Total					7,172,720	19,554,480

*Source: JICA Study Team***Table 50 Land Acquisition and Compensation Cost for the Mudun Ela Sub-basin Improvement (Pre-F/S)**Land Acquisition and Compensation for Mudun Ela Sub-basin
(existing route)

Description	Cost LC (LKR)	Cost FC (LKR)
Land Acquisition	858,937,730	0
Affected building compensation	11,339,397	0
Land acquisition for resettlement	0	0
Total	870,277,127	0

(shortcut route)

Description	Cost LC (LKR)	Cost FC (LKR)
Land Acquisition	1,200,001,466	0
Affected building compensation	43,059,381	0
Land acquisition for resettlement	0	0
Total	1,243,060,847	0

*Source: JICA Study Team***Table 51 Land Acquisition Cost for the Mudun Ela Sub-basin Improvement (Pre-F/S)**

Land Acquisition (existing route)

Description	Unit	Quantity (m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Mudun Ela (1)	m2	0.96	45	43	39,400	0	1,702,080	0
Mudun Ela (2)	m2	0.00	225	0	39,400	0	0	0
Mudun Ela (3)	m2	11.23	1,563	17,552	39,400	0	691,568,106	0
Mudun Ela (4)	m2	0.84	711	597	39,400	0	23,531,256	0
Mudun Ela (5)	m2	12.91	272	3,512	39,400	0	138,353,888	0
Mudun Ela (L1)	m2	0.80	120	96	39,400	0	3,782,400	0
Mudun Ela Sub-basin Existing Route Total				21,800			858,937,730	0

Land Acquisition (shortcut route)

Description	Unit	Quantity (m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Mudun Ela (1)	m2	0.96	45	43	39,400	0	1,702,080	0
Mudun Ela (2)	m2	0.00	225	0	39,400	0	0	0
Mudun Ela (S-1)	m2	5.71	493	2,815	39,400	0	110,912,182	0
Mudun Ela (S-2)	m2	28.91	490	14,166	39,400	0	558,136,460	0
Mudun Ela (S-3)	m2	38.45	240	9,228	39,400	0	363,583,200	0
Mudun Ela (4)	m2	0.84	711	597	39,400	0	23,531,256	0
Mudun Ela (5)	m2	12.91	272	3,512	39,400	0	138,353,888	0
Mudun Ela (L1)	m2	0.80	120	96	39,400	0	3,782,400	0
Mudun Ela Sub-basin Shortcut Route Total				30,457			1,200,001,466	0

Source: JICA Study Team

Table 52

Detailed Compensation Cost for the Mudun Ela Sub-basin Improvement (Pre-F/S)

Affected building compensation

Mudun Ela sub-basin existing route

ID	Structure area (m ²)	Affected area (m ²)	Affected rate (%)	Compensation unit price (LC, LKR/m ²)	Compensation unit price (FC, LKR/m ³)	Compensation price (LC, LKR)	Compensation price (FC, LKR)
1	15.55	14.56	94%	2,200	0	34,199	0
2	15.23	14.93	98%	2,200	0	33,508	0
3	41.27	23.38	57%	2,200	0	90,787	0
4	45.18	19.12	42%	2,200	0	99,396	0
5	34.91	13.95	40%	2,200	0	76,811	0
6	25.42	1.27	5%	2,200	0	2,794	0
7	358.23	80.97	23%	23,000	0	8,239,313	0
8	210.56	31.81	15%	2,200	0	463,234	0
9	113.74	113.74	100%	2,200	0	250,219	0
10	40.81	40.81	100%	2,200	0	89,773	0
11	24.06	17.58	73%	2,200	0	52,934	0
12	70.03	70.03	100%	2,200	0	154,057	0
13	98.75	47.04	48%	2,200	0	217,254	0
14	40.05	40.05	100%	2,200	0	88,108	0
15	76.97	34.64	45%	2,200	0	169,325	0
16	58.78	58.78	100%	2,200	0	129,309	0
17	133.77	57.00	43%	2,200	0	294,292	0
18	113.00	77.91	69%	2,200	0	248,602	0
19	128.52	93.89	73%	2,200	0	282,733	0
20	74.37	50.60	68%	2,200	0	163,607	0
21	72.34	72.34	100%	2,200	0	159,139	0
Subtotal						11,339,397	0

Mudun Ela sub-basin shortcut route

ID	Structure area (m ²)	Affected area (m ²)	Affected rate (%)	Compensation unit price (LC, LKR/m ²)	Compensation unit price (FC, LKR/m ³)	Compensation price (LC, LKR)	Compensation price (FC, LKR)
1	15.55	14.56	94%	2,200	0	34,199	0
2	15.23	14.93	98%	2,200	0	33,508	0
3	41.27	23.38	57%	2,200	0	90,787	1
4	45.18	19.12	42%	2,200	0	99,396	2
5	34.91	13.95	40%	2,200	0	76,811	3
6	25.42	1.27	5%	2,200	0	2,794	4
7	358.23	80.97	23%	23,000	0	8,239,313	5
8	210.56	31.81	15%	2,200	0	463,234	6
9	113.74	113.74	100%	2,200	0	250,219	7
10	40.81	40.81	100%	2,200	0	89,773	8
11	24.06	17.58	73%	2,200	0	52,934	9
12	70.03	70.03	100%	2,200	0	154,057	10
13	98.75	47.04	48%	2,200	0	217,254	11
14	51.06	23.57	46%	2,200	0	112,336	12
15	47.47	46.77	99%	2,200	0	104,443	13
16	56.73	56.48	100%	2,200	0	124,806	14
17	33.98	33.99	100%	2,200	0	74,767	15
18	50.27	50.27	100%	2,200	0	110,601	16
19	22.29	22.29	100%	2,200	0	49,027	17
20	17.65	12.19	69%	2,200	0	38,828	18
21	30.58	30.25	99%	2,200	0	67,283	0
22	32.39	32.39	100%	2,200	0	71,249	0
23	35.29	35.29	100%	2,200	0	77,638	0
24	56.95	56.95	100%	2,200	0	125,292	0
25	24.29	24.29	100%	2,200	0	53,436	0
26	50.02	10.75	21%	2,200	0	110,033	0
27	26.62	9.79	37%	2,200	0	58,560	0
28	18.14	18.14	100%	2,200	0	39,901	0
29	44.53	44.53	100%	2,200	0	97,964	0
30	24.26	17.69	73%	2,200	0	53,374	0
31	38.22	38.22	100%	2,200	0	84,093	0
32	65.38	61.36	94%	2,200	0	143,845	0
33	64.71	4.01	6%	2,200	0	8,824	0
34	66.60	54.62	82%	2,200	0	146,524	0
35	31.16	4.73	15%	2,200	0	68,561	0
36	14.56	8.60	59%	2,200	0	32,032	0
37	138.75	21.13	15%	2,200	0	305,239	0
38	91.36	29.57	32%	2,200	0	200,996	0
39	8.05	1.68	21%	2,200	0	17,710	0
40	82.45	40.61	49%	2,200	0	181,383	0
41	14.04	14.04	100%	2,200	0	30,888	0
42	22.92	22.92	100%	2,200	0	50,422	0
43	18.66	18.66	100%	2,200	0	41,059	0
44	25.55	19.81	78%	2,200	0	56,199	0
45	53.97	53.97	100%	2,200	0	118,738	0
46	29.32	29.32	100%	2,200	0	64,504	0
47	61.03	61.03	100%	2,200	0	134,264	0
48	193.87	168.12	87%	2,200	0	426,521	0
49	251.45	191.90	76%	23,000	0	5,783,235	0
50	1,008.37	716.54	71%	23,000	0	23,192,441	0
51	55.12	6.10	11%	2,200	0	121,257	0
52	20.45	8.36	41%	2,200	0	44,997	0
53	46.62	46.62	100%	2,200	0	102,557	0
54	50.71	50.71	100%	2,200	0	111,566	0
55	46.97	15.13	32%	2,200	0	103,336	0
56	19.71	18.85	96%	2,200	0	43,362	0
57	30.73	29.80	97%	2,200	0	67,595	0
58	20.13	20.13	100%	2,200	0	44,275	0
59	72.34	72.34	100%	2,200	0	159,139	0
						43,059,381	

Source: JICA Study Team

Table 53 Construction Cost for Weras Ganga Right Bank Dike (Pre-F/S)

Weras Ganga

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Preparatory Works	3,730,874	3,061,641	6,792,515
Earth work	27,462,749	21,543,898	49,006,647
Parapet Wall	17,660,129	10,898,844	28,558,973
U-Ditch	20,226,889	10,263,671	30,490,560
Road Work	6,761,528	8,501,707	15,263,235
Gate Works	2,506,175	10,024,693	12,530,868
Others	7,461,747	6,123,281	13,585,028
Total	85,810,091	70,417,735	156,227,826

Weras Ganga Right Bank

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Canal Bank Clearing	843,557	0	843,557
Cutting of top soil layer	2,983,837	6,968,172	9,952,009
Disposal of soil (Bolgoda)	1,883,290	4,384,534	6,267,824
Embankment	6,877,879	6,867,149	13,745,028
Turf	7,119,305	0	7,119,305
Concrete for Wall	5,069,033	10,772,088	15,841,121
Formwork for Wall	12,591,096	126,756	12,717,852
Concrete Pavement	3,899,256	8,286,221	12,185,477
Base Course	2,862,272	215,486	3,077,758
Total	44,129,525	37,620,406	81,749,931

Weras Ganga Right Bank (U-ditch)

Description	Cost LC (LKR)	Cost FC (LKR)	Cost Total (LKR)
Canal Bank Clearing	281,091	0	281,091
Excavation	2,241,343	1,204,641	3,445,984
Backfill	2,808,225	886,725	3,694,950
Disposal of soil (Bolgoda)	529,472	1,232,677	1,762,149
Turf	1,894,750	0	1,894,750
Concrete for U-ditch	4,700,426	9,988,768	14,689,194
Formwork for U-ditch	13,708,000	138,000	13,846,000
Base Course	1,818,463	136,903	1,955,366
Total	27,981,770	13,587,714	41,569,484

Source: JICA Study Team

Table 54 Detailed Construction Cost for Weras Ganga Right Bank Dike (Pre-F/S)

Weras Ganga Right Bank

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	19,618	43	0	843,557	0
Cutting of top soil layer	m3	5885.28	507	1,184	2,983,837	6,968,172
Disposal of soil (Bolgoda)	m3	5885.28	320	745	1,883,290	4,384,534
Embankment	m3	10729.92	641	640	6,877,879	6,867,149
Turf	m2	12211.5	583	0	7,119,305	0
Concrete for Wall	m3	784.68	6,460	13,728	5,069,033	10,772,088
Formwork for Wall	m2	5281.5	2,384	24	12,591,096	126,756
Concrete Pavement	m3	603.6	6,460	13,728	3,899,256	8,286,221
Base Course	m3	603.6	4,742	357	2,862,272	215,486

Weras Ganga Right Bank (U-ditch)

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Canal Bank Clearing	m2	6,537	43	0	281,091	0
Excavation	m3	3,230	694	373	2,241,343	1,204,641
Backfill	m3	1,575	1,783	563	2,808,225	886,725
Disposal of soil (Bolgoda)	m3	1,655	320	745	529,472	1,232,677
Turf	m2	3,250	583	0	1,894,750	0
Concrete for U-ditch	m3	728	6,460	13,728	4,700,426	9,988,768
Formwork for U-ditch	m2	5,750	2,384	24	13,708,000	138,000
Base Course	m3	383	4,742	357	1,818,463	136,903

Flap gate

Description	Unit	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Flap gate	nos	7	358,025	1,432,099	2,506,175	10,024,693

Note: The unit price was calculate based on a sample cost of the gate in Sri Lanka with 4m x 5.4m x 3gates at 116,000,000 LKR.

Source: JICA Study Team

Table 55 Quantity of Weras Ganga Right Bank Dike (Pre-F/S)**Right Bank Dike Total**

Description	Quantity/m	Distance (m)	Unit	Quantity
Canal Bank Clearing	-	-	m2	19,618
Cutting of top soil layer	-	-	m3	5,885
Disposal of soil (Bolgoda)	-	-	m3	5,885
Embankment	-	-	m3	10,730
Turf	-	-	m2	12,212
Concrete for Wall	-	-	m3	785
Formwork for Wall	-	-	m2	5,282
Concrete Pavement	-	-	m3	604
Base Course	-	-	m3	604
Total				

Right Bank Dike Type 1 (Embankment height: 0.5m)

Description	Quantity/m	Distance (m)	Unit	Quantity
Canal Bank Clearing	5.20	1,056	m2	5,491
Cutting of top soil layer	1.56	1,056	m3	1,647
Disposal of soil (Bolgoda)	1.56	1,056	m3	1,647
Embankment	1.54	1,056	m3	1,626
Turf	2.59	1,056	m2	2,735
Concrete for Wall	0.26	1,056	m3	275
Formwork for Wall	1.75	1,056	m2	1,848
Concrete Pavement	0.20	1,056	m3	211
Base Course	0.20	1,056	m3	211
Total				

Right Bank Dike Type 2 (Embankment height: 1.0m)

Description	Quantity/m	Distance (m)	Unit	Quantity
Canal Bank Clearing	7.20	1,962	m2	14,126
Cutting of top soil layer	2.16	1,962	m3	4,238
Disposal of soil (Bolgoda)	2.16	1,962	m3	4,238
Embankment	4.64	1,962	m3	9,104
Turf	4.83	1,962	m2	9,476
Concrete for Wall	0.26	1,962	m3	510
Formwork for Wall	1.75	1,962	m2	3,434
Concrete Pavement	0.20	1,962	m3	392
Base Course	0.20	1,962	m3	392
Total				

U-ditch Total

Description	Quantity/m	Distance (m)	Unit	Quantity
Canal Bank Clearing	-	-	m2	6,537
Excavation	-	-	m3	3,230
Backfill	-	-	m3	1,575
Disposal of soil (Bolgoda)	-	-	m3	1,655
Turf	-	-	m2	3,250
Concrete for U-ditch	-	-	m3	728
Formwork for U-ditch	-	-	m2	5,750
Base Course for U-ditch	-	-	m3	383
Total				

Source: JICA Study Team

Table 56 Land Acquisition and Compensation Cost for Weras Ganga Right Bank Dike (Pre-F/S)

Land Acquisition and Compensation for Weras ganga Right Bank Di

Description	Cost LC (LKR)	Cost FC (LKR)
Land Acquisition	942,858,400	0
Affected building compensation	35,239,471	0
Land acquisition for resettlement	0	0
Total	978,097,871	0

*Source: JICA Study Team***Table 57 Land Acquisition Cost for Weras Ganga Right Bank Dike (Pre-F/S)**

Land Acquisition (for Right Bank Dike)

Description	Unit	at (MSL)	Quantity (m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Section1	m2	1.0	7.2	1,200	8,640	44,000	0	380,160,000	0
Section2	m2	0.5	5.2	87	452	44,000	0	19,905,600	0
Section3	m2	1.0	7.2	45	324	44,000	0	14,256,000	0
Section4	m2	0.5	5.2	358	1,862	44,000	0	81,910,400	0
Section5	m2	0.5	5.2	73	380	0	0	0	0
Section6	m2	1.0	7.2	186	1,339	44,000	0	58,924,800	0
Section7	m2	0.5	5.2	100	520	0	0	0	0
Section8	m2	1.0	7.2	301	2,167	44,000	0	95,356,800	0
Section9	m2	1.0	7.2	230	1,656	0	0	0	0
Section10	m2	0.5	5.2	170	884	44,000	0	38,896,000	0
Section11	m2	0.5	5.2	268	1,394	0	0	0	0
Total				3,018	19,618			689,409,600	0

Land Acquisition (for U-ditch)

Description	Unit	Ditch B (m)	Quantity (m)	Distance (m)	Quantity	Unit Price LC (LKR/)	Unit Price FC (LKR/)	Cost LC (LKR)	Cost FC (LKR)
Section1	m2	0.8	2.8	478	1,338	44,000	0	58,889,600	0
Section2	m2	0.6	2.6	147	382	44,000	0	16,816,800	0
Section3	m2	0.5	2.5	121	303	44,000	0	13,310,000	0
Section4	m2	0.6	2.6	254	660	44,000	0	29,057,600	0
Section5	m2	0.5	2.5	207	518	44,000	0	22,770,000	0
Section6	m2	0.6	2.6	484	1,258	44,000	0	55,369,600	0
Section7	m2	0.6	2.6	309	803	0	0	0	0
Section8	m2	0.5	2.5	150	375	44,000	0	16,500,000	0
Section9	m2	0.6	2.6	134	348	0	0	0	0
Section10	m2	0.6	2.6	108	281	44,000	0	12,355,200	0
Section11	m2	0.5	2.5	108	270	44,000	0	11,880,000	0
Section12	m2	0.5	2.5	100	250	0	0	0	0
Section13	m2	0.5	2.5	150	375	44,000	0	16,500,000	0
Section14	m2	0.5	2.5	268	670	0	0	0	0
Total				3,018				253,448,800	0

Source: JICA Study Team

Table 58 Detailed Compensation Cost for Weras Ganga Right Bank Dike (Pre-F/S)

Affected building compensation

Weras Ganga Right Bank

ID	Structure area (m2)	Affected area (m2)	Affected rate (%)	Compensation unit price (LC, LKR/m2)	Compensation unit price (FC, LKR/m3)	Compensation (LC, LKR)	Compensation (FC, LKR)	Type of use	Relocation
1	62.40	45.11	72%	29,000	0	1,809,600	0	House	Yes
2	71.30	23.47	33%	29,000	0	2,067,700	0	House	Yes
3	155.20	3.66	2%	29,000	0	106,082	0	House	No
Rathmalana subtotal								House: 3nos	Yes: 2nos
Moratuwa									
4	42.30	6.58	16%	29,000	0	1,226,700	0	Storage	No
5	40.80	19.90	49%	29,000	0	1,183,200	0	House	Yes
6	75.10	11.95	16%	29,000	0	2,177,900	0	House	Yes
7	20.30	19.65	97%	29,000	0	588,700	0	Storage	No
8	33.10	16.23	49%	29,000	0	959,900	0	Storage	No
9	78.10	21.54	28%	29,000	0	2,264,900	0	House	Yes
10	41.80	8.60	21%	29,000	0	1,212,200	0	House	Yes
11	69.00	43.57	63%	29,000	0	2,001,000	0	House	Yes
12	5.10	5.09	100%	2,200	0	11,220	0	Storage	No
13	42.20	3.62	9%	29,000	0	105,009	0	House	No
14	83.10	59.36	71%	29,000	0	2,409,900	0	House	Yes
15	59.70	0.24	0%	29,000	0	6,902	0	House	No
16	47.70	6.89	14%	29,000	0	1,383,300	0	House	Yes
17	95.70	51.49	54%	29,000	0	2,775,300	0	Storage	No
18	76.60	3.34	4%	29,000	0	96,831	0	House	No
19	27.10	4.54	17%	29,000	0	785,900	0	Storage	No
20	3.80	3.81	100%	2,200	0	8,360	0	Storage	No
21	360.50	5.43	2%	29,000	0	157,557	0	House	No
22	86.80	49.69	57%	29,000	0	2,517,200	0	House	Yes
23	30.50	7.53	25%	29,000	0	884,500	0	House	Yes
24	40.00	40.04	100%	29,000	0	1,160,000	0	House	Yes
25	421.40	19.09	5%	29,000	0	553,465	0	Storage	No
26	42.70	1.38	3%	29,000	0	39,962	0	Storage	No
27	85.50	47.78	56%	29,000	0	2,479,500	0	House	Yes
28	61.30	38.54	63%	29,000	0	1,777,700	0	House	Yes
29	59.00	4.91	8%	29,000	0	142,274	0	House	No
30	80.10	78.98	99%	29,000	0	2,322,900	0	House	Yes
31	85.30	0.82	1%	29,000	0	23,809	0	House	No
Moratuwa subtotal								House: 19nos	Yes: 13nos
Subtotal						35,239,471		House: 22nos	Yes: 15nos

Source: JICA Study Team

Table 59 Construction Cost for the Moratuwa-Rathmalana Area Drainage Channel Improvement (Pre-F/S)

(Unit: LKR)

Canal Name	Construction Cost		
	LC	FC	Total
A-2R	61,830,714	88,840,407	150,671,121
A-2L-1	35,199,366	49,164,439	84,363,805
A-C	23,099,843	17,655,870	40,755,713
A-C5	38,346,999	20,154,246	58,501,245
A-C6	18,737,808	13,370,850	32,108,658
B-C2B2	8,118,861	6,020,031	14,138,892
B-C5	21,154,784	21,615,645	42,770,429
B-B1	27,916,695	24,241,865	52,158,560
B-B1T4	18,100,212	18,508,820	36,609,032
B-B1T5	27,945,634	37,833,519	65,779,153
B-C4	36,043,081	17,289,323	53,332,404
Total	316,493,997	314,695,015	631,189,012

Source: JICA Study Team

Table 60 Detailed Construction Cost for the Moratuwa-Rathmalana Area Drainage Channel Improvement (1/9) (Pre-F/S)

1) Cost for U-ditch type channel improvement (1/5)

Zone	Name	Design scale	Section	from (m)	to (m)	Clearing (m3)	Excavation (m3)	SSP Temp. Retaining (m2)	Embankment (m3)	Backfill (m3)	Spoil (m3)	Concrete (m3)	Form (m2)	Rebar (kg)	Gravel (m3)	Lean concrete (m3)	Turf (m2)	Concrete pavement (m3)	Land Acquisition (m2)	Clearing		Excavation				
																				LC (LKR/m2)	FC (LKR/m2)	LC (LKR/m2)	FC (LKR/m2)			
A	2R	5	1	0	542	0	1,231	2,710	0	744	3,198	307	2,765	18,374	82	82	0	27	117	117	117	117	694	373		
			2	542	782	0	432	720	0	176	976	1,224	32	7,704	32	32	0	0	0	0	0	117	117	694	373	
			3	782	1043	79	1,173	1,697	0	365	2,505	187	1,332	11,197	66	66	0	0	0	0	0	117	117	694	373	
			4	1043	1205	0	368	729	0	263	835	97	827	5,784	28	28	0	0	0	0	0	0	117	117	694	373
			5	1205	1363	0	344	790	0	231	903	0	310	4,657	24	24	0	0	0	0	0	0	117	117	694	373
2L-1	5	5	1	0	525	0	2,226	3,150	0	907	4,469	415	3,308	24,885	126	126	0	0	0	0	0	117	117	694	373	
			2	525	666	106	456	353	0	237	572	100	635	0	20	20	85	0	106	106	117	117	694	373		
			3	666	1,069	1,104	0	895	209	248	2,016	14,880	74	74	0	6	6	1,069	1,069	117	117	694	373			
			4	1,069	1,319	1,319	0	536	197	210	1,376	12,576	80	80	0	3	3	227	227	117	117	694	373			
			5	1,319	1,496	1,496	0	309	117	90	581	5,346	18	18	187	11	11	1,098	1,098	117	117	694	373			
C5	10	5	1	0	311	1,101	2,217	0	1,161	1,057	232	1,960	13,902	63	63	0	63	0	63	1,098	117	117	694	373		
			2	311	392	137	321	0	171	151	77	365	0	16	16	0	17	17	141	141	117	117	694	373		
			3	392	530	365	582	0	297	286	111	621	0	23	23	0	28	28	280	280	117	117	694	373		
			4	530	511	0	905	0	516	390	164	1,412	9,812	45	45	0	383	383	117	117	694	373				
			5	511	153	253	1,083	0	664	420	124	1,087	7,390	33	33	0	635	635	117	117	694	373				
C5	5	5	1-1	0	153	635	1,083	0	664	420	124	1,087	7,390	33	33	0	635	635	117	117	694	373				
			1-2	153	253	191	465	900	0	201	1,164	81	710	4,830	21	21	0	131	131	117	117	694	373			
			1-3	253	324	295	503	0	308	195	58	505	3,430	15	15	0	295	295	117	117	694	373				
			2-1	324	392	249	374	0	275	100	51	483	3,040	12	12	0	248	248	117	117	694	373				
			2-2	392	408	37	71	144	0	47	24	12	114	716	3	3	0	37	37	117	117	694	373			
B1	5	5	2	57	182	532	736	0	429	308	101	788	6,038	32	32	0	148	148	117	117	694	373				
			3-1	182	229	158	224	0	155	69	29	240	1,721	9	9	0	47	47	117	117	694	373				
			3-2	229	244	51	43	0	19	22	10	77	549	3	3	0	694	694	117	117	694	373				
			3-3	244	259	0	72	98	0	50	22	10	77	549	3	3	0	15	15	117	117	694	373			
			3-4	259	312	178	151	0	64	78	33	271	1,940	10	10	0	0	0	0	0	0	117	117	694	373	
B1T4	5	5	3-5	312	434	0	579	793	0	401	179	75	623	4,466	22	22	0	121	121	117	117	694	373			
			4-1	434	496	154	324	0	114	210	54	279	0	12	12	0	100	100	117	117	694	373				
			4-2	496	532	90	130	0	32	122	31	162	0	7	7	0	46	46	117	117	694	373				
			4-3	532	595	157	329	0	116	213	55	284	0	12	12	0	102	102	117	117	694	373				
			5	595	710	234	626	0	224	403	90	518	0	21	21	0	194	194	117	117	694	373				
B1T5	5	5	1	0	170	391	617	0	292	326	136	765	0	29	29	0	391	391	117	117	694	373				
			2	170	510	684	941	850	0	572	1,219	259	1,530	0	51	51	0	751	751	117	117	694	373			
			3	510	670	188	359	0	135	224	106	592	0	24	24	0	219	219	117	117	694	373				
			4	670	1,319	800	570	570	0	358	1,013	111	817	6,612	38	38	0	559	559	117	117	694	373			
			5	1,319	370	465	635	540	0	294	882	148	810	0	33	33	0	464	464	117	117	694	373			
B1T5	5	5	3	370	670	840	1,235	900	0	618	1,518	690	1,350	0	51	51	0	837	837	117	117	694	373			

Source: JICA Study Team

Table 61 Detailed Construction Cost for the Moratuwa-Rathmalana Area Drainage Channel Improvement (2/9) (Pre-F/S)

Zone	Name	Design scale	Section	SSP Temp. Retaining		Embankment		Backfill		Disposal		Concrete		Form		Rebar		G-foundation rock		Lean concrete			
				LC (LKR/m ²)	FC (LKR/m ²)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ²)	FC (LKR/m ²)	LC (LKR/kg)	FC (LKR/kg)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ³)	FC (LKR/m ³)		
A	2R		5	1	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728	
				2	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728	
				3	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728	
				4	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728	
				5	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728	
	2L-1		5	2	1	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728
					2	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728
					3	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728
					4	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728
					5	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728
B	C5		5	1	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728	
				2	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728	
				3	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728	
				4	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728	
				5	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728	
	C6		5	2	1	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728
					2	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728
					3	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728
					4	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728
					5	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728
B1	C2B2		5	1-1	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728	
				1-2	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728	
				1-3	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728	
				2-1	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728	
				2-2	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728	
	C5		5	3	1	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728
					2	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728
					3	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728
					4	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728
					5	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728
BIT4	BIT4		5	1	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728	
				2	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728	
				3	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728	
				4	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728	
				5	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728	
	BIT5		5	3	1	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728
					2	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728
					3	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728
					4	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728
					5	3,475	8,509	641	640	1,783	563	320	745	6,460	13,728	2,384	24	122	183	5,097	1,522	6,460	13,728

Source: JICA Study Team

Table 62 Detailed Construction Cost for the Moratuwa-Rathmalana Area Drainage Channel Improvement (3/9) (Pre-F/S)

1) Cost for U-ditch type channel improvement (3/5)

Zone	Name	Design scale	Turf		Concrete pave.		Land price		Clearing		Excavation		SSP Temp. Retaining		Embankment									
			LC (LKR/m2)	FC (LKR/m2)	LC (LKR/m3)	FC (LKR/m3)	LC (LKR/m2)	FC (LKR/m2)	LC (LKR/m2)	FC (LKR/m2)	LC (LKR)	FC (LKR)	LC (LKR)	FC (LKR)	LC (LKR)	FC (LKR)	Total (LKR)							
A	2R		1	583	0	3,621	494	44,000	0	0	0	854,314	459,163	1,313,477	9,417,250	23,059,390	32,476,640	0	0	0				
			2	583	0	3,621	494	44,000	0	0	0	299,808	161,136	460,944	2,502,000	6,126,480	8,628,480	0	0	0				
			3	583	0	3,621	494	44,000	0	0	0	9,243	9,243	18,486	814,062	437,529	1,251,591	5,897,075	14,439,773	20,336,848	0	0		
			4	583	0	3,621	494	44,000	0	0	0	0	0	0	255,392	137,264	392,656	2,533,275	6,203,061	8,736,336	0	0	0	
			5	583	0	3,621	494	44,000	0	0	0	0	0	0	238,736	128,312	367,048	2,745,250	6,722,110	9,467,360	0	0	0	
	2L-1			1	583	0	3,621	494	44,000	0	0	0	1,544,844	830,298	2,375,142	10,946,250	26,803,350	37,749,600	0	0	0			
				2	583	0	3,621	494	44,000	0	0	0	12,402	12,402	24,804	316,464	170,088	486,552	1,226,675	3,003,677	4,230,352	0	0	0
				3	583	0	3,621	494	44,000	0	0	0	125,073	125,073	250,146	766,176	411,792	1,177,968	0	0	0	0	0	
				4	583	0	3,621	494	44,000	0	0	0	55,809	55,809	111,618	508,702	273,409	782,111	0	0	0	0	0	
				5	583	0	3,621	494	44,000	0	0	0	26,559	26,559	53,118	217,916	117,122	335,038	0	0	0	0	0	
	C			1	583	0	3,621	494	44,000	0	0	0	42,705	42,705	85,410	403,908	217,086	620,994	0	0	0	0		
				2	583	0	3,621	494	44,000	0	0	0	0	0	0	628,070	337,565	965,635	0	0	0	0	0	
				3	583	0	3,621	494	44,000	0	0	0	0	0	0	751,602	403,959	1,155,561	0	0	0	0	0	
				4	583	0	3,621	494	44,000	0	0	0	0	0	0	322,710	173,445	496,155	3,127,500	7,658,100	10,785,600	0	0	0
				5	583	0	3,621	494	44,000	0	0	0	0	0	0	349,082	187,619	536,701	0	0	0	0	0	
B	C2B2		1	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0			
			2	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
			3	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			4	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			5	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	C5			1	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0		
				2	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				3	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				4	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				5	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	B1			1	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0		
				2	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				3	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				4	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				5	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B1T4			1	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0			
			2	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
			3	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
			4	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
			5	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
B1T5			1	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0			
			2	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
			3	583	0	3,621	494	44,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Source: JICA Study Team

Table 63 Detailed Construction Cost for the Moratuwa-Rathmalana Area Drainage Channel Improvement (4/9) (Pre-F/S)

1) Cost for U-ditch type channel improvement (4/5)

Zone	Name	Design scale	Section			Backfill			Disposal			Concrete			Form			Rebar			G-foundation rock											
			LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)									
A	2R	5	1	1,326,552	418,872	1,745,424	1,023,360	2,382,510	3,405,870	1,983,220	4,214,496	6,197,716	6,658,120	2,241,628	3,362,442	5,604,070	417,954	124,804	542,758	2,241,628	3,362,442	5,604,070	417,954	124,804	542,758							
			2	313,808	99,088	412,896	312,320	727,120	1,039,440	833,340	1,770,912	2,604,252	2,937,720	3,247,392	939,888	1,409,832	2,349,720	163,104	48,704	211,808	939,888	1,409,832	2,349,720	163,104	48,704	211,808						
			3	650,795	205,495	856,290	801,600	1,866,225	2,667,825	1,208,020	2,567,136	3,775,156	3,175,468	3,968,656	1,366,034	2,049,051	3,415,085	336,402	100,452	436,854	1,366,034	2,049,051	3,415,085	336,402	100,452	436,854						
			4	468,929	148,069	616,998	267,200	622,075	889,275	626,620	1,331,616	1,958,236	1,971,568	19,848	1,991,416	7,056,648	1,058,472	1,764,120	142,716	42,616	185,332	7,056,648	1,058,472	1,764,120	142,716	42,616	185,332					
			5	411,873	130,053	541,926	288,960	672,735	961,695	581,400	1,235,520	1,816,920	1,940,848	19,344	1,940,848	653,554	980,331	1,633,885	122,328	36,528	158,856	653,554	980,331	1,633,885	122,328	36,528	158,856					
2L-1	5	1	1,617,181	510,641	2,127,822	1,430,080	3,329,405	4,759,485	2,680,900	5,697,120	8,378,020	7,886,272	79,392	7,965,664	3,035,970	4,553,995	7,589,925	642,222	191,772	833,994	3,035,970	4,553,995	7,589,925	642,222	191,772	833,994						
			2	422,571	133,431	556,002	183,040	426,140	609,180	646,000	1,372,800	2,018,800	1,513,840	15,240	1,529,080	0	0	0	101,940	30,440	132,380	0	0	0	101,940	30,440	132,380					
C	5	1	1,595,785	503,885	2,099,670	66,880	155,705	222,585	1,602,080	3,404,544	5,006,624	4,806,144	48,384	4,854,528	1,815,360	2,723,040	4,538,400	377,178	112,628	489,806	1,815,360	2,723,040	4,538,400	377,178	112,628	489,806						
			2	955,688	301,768	1,257,456	63,040	146,765	209,805	1,356,600	2,882,880	4,239,480	3,280,384	33,024	3,313,408	1,534,272	2,301,408	3,835,680	407,760	121,760	529,520	1,534,272	2,301,408	3,835,680	407,760	121,760	529,520					
			3	294,195	92,895	387,090	0	0	0	620,160	1,317,888	1,938,048	1,287,360	12,960	1,300,320	0	0	0	107,037	31,962	138,999	0	0	0	107,037	31,962	138,999					
C5	10	4	550,947	173,967	724,914	37,440	87,165	124,605	581,400	1,235,520	1,816,920	1,940,848	19,344	1,940,848	653,554	980,331	1,633,885	122,328	36,528	158,856	653,554	980,331	1,633,885	122,328	36,528	158,856						
			5	2,070,063	653,643	2,723,706	338,240	787,465	1,125,705	1,498,720	3,184,896	4,683,616	4,672,640	47,040	4,719,680	1,696,044	2,544,066	4,240,110	321,111	95,886	416,997	1,696,044	2,544,066	4,240,110	321,111	95,886	416,997					
C6	5	2	304,893	96,273	401,166	48,320	112,495	160,815	497,420	1,057,056	1,554,476	870,160	8,760	878,920	0	0	0	81,552	24,352	105,904	1,057,056	1,554,476	870,160	8,760	878,920	0	0	81,552	24,352	105,904		
			3	529,551	167,211	696,762	91,520	213,070	304,590	717,080	1,523,808	2,240,868	1,480,464	14,904	1,495,368	0	0	0	117,231	35,006	152,237	1,495,368	2,240,868	1,480,464	14,904	1,495,368	0	0	117,231	35,006	152,237	
			5	920,028	290,508	1,210,536	124,800	290,550	415,350	1,059,440	2,251,392	3,310,832	3,366,208	33,888	3,400,096	1,197,064	1,795,596	2,992,660	229,365	68,490	297,855	1,197,064	1,795,596	2,992,660	229,365	68,490	297,855					
B	C5	5	1-1	1,183,912	373,832	1,557,744	134,400	312,900	447,300	801,040	1,702,272	2,503,312	2,591,408	26,088	2,617,496	901,580	1,352,370	2,253,950	168,201	50,226	218,427	2,591,408	2,617,496	901,580	1,352,370	2,253,950	168,201	50,226	218,427			
			1-2	358,383	113,163	471,546	372,480	867,180	1,239,660	523,260	1,111,968	1,635,228	1,692,640	17,040	1,709,680	883,890	1,473,150	1,07,037	31,962	138,999	1,692,640	1,709,680	883,890	1,473,150	1,07,037	31,962	138,999					
			1-3	549,164	173,404	722,568	62,400	145,275	207,675	374,680	796,224	1,170,904	1,203,920	12,120	1,216,040	418,460	627,690	1,046,150	76,455	22,830	99,285	1,203,920	1,216,040	418,460	627,690	1,046,150	76,455	22,830	99,285			
			2-1	490,325	154,825	645,150	32,000	74,500	106,500	329,460	700,128	1,029,588	1,151,472	11,592	1,163,064	370,880	556,320	927,200	61,164	18,264	79,428	1,163,064	1,151,472	11,592	1,163,064	370,880	556,320	927,200	61,164	18,264	79,428	
			2-2	83,801	26,461	110,262	7,680	17,880	25,560	77,520	164,736	242,256	271,776	2,736	274,512	87,352	131,028	218,380	15,291	4,566	19,857	271,776	274,512	87,352	131,028	218,380	15,291	4,566	19,857			
			5	2	764,907	241,527	1,006,434	98,560	229,460	328,020	652,460	1,386,528	2,038,988	1,878,592	18,912	1,897,504	736,636	1,104,954	1,841,590	163,104	48,704	211,808	1,897,504	1,878,592	18,912	1,897,504	736,636	1,104,954	1,841,590	163,104	48,704	211,808
			3-1	276,365	87,265	363,630	22,080	51,405	73,485	187,340	398,112	585,452	572,160	5,760	577,920	209,962	314,943	524,905	45,873	13,698	59,571	577,920	572,160	5,760	577,920	209,962	314,943	524,905	45,873	13,698	59,571	
			3-2	33,877	10,697	44,574	7,040	16,390	23,430	64,600	137,280	201,880	183,568	1,848	185,416	66,978	100,467	167,445	15,291	4,566	19,857	183,568	185,416	1,848	185,416	66,978	100,467	167,445	15,291	4,566	19,857	
			3-3	89,150	28,150	117,300	7,040	16,390	23,430	64,600	137,280	201,880	183,568	1,848	185,416	66,978	100,467	167,445	15,291	4,566	19,857	183,568	185,416	1,848	185,416	66,978	100,467	167,445	15,291	4,566	19,857	
			3-4	114,112	36,032	150,144	24,960	58,110	83,070	213,180	453,024	666,204	646,064	6,504	652,568	236,680	355,020	591,700	50,970	15,220	66,190	646,064	652,568	236,680	355,020	591,700	50,970	15,220	66,190			
3-5	714,983	225,763	940,746	57,280	133,355	190,635	484,500	1,029,600	1,514,100	1,485,232	14,952	1,500,184	544,852	817,278	1,362,130	112,134	33,484	145,618	1,485,232	1,495,232	14,952	1,500,184	544,852	817,278	1,362,130	112,134	33,484	145,618				
B1T4	4-1	2	203,262	64,182	267,444	67,200	156,450	223,650	348,840	741,312	1,090,152	665,136	6,696	671,832	0	0	0	61,164	18,264	79,428	665,136	671,832	6,696	671,832	0	0	61,164	18,264	79,428			
			4-2	57,056	18,016	75,072	39,040	90,890	129,930	200,260	425,568	625,828	386,208	3,888	390,096	0	0	0	35,679	10,654	46,333	425,568	625,828	386,208	3,888	390,096	0	0	35,679	10,654	46,333	
			4-3	206,828	65,308	272,136	68,160	158,685	226,845	355,300	755,040	1,110,340	677,056	6,816	683,872	0	0	0	61,164	18,264	79,428	677,056	683,872	6,816	683,872	0	0	61,164	18,264	79,428		
			5	399,392	126,112	525,504	128,960	300,235	429,195	581,400	1,235,520	1,816,920	1,940,848	19,344	1,940,848	653,554	980,331	1,633,885	122,328	36,528	158,856	1,816,920	1,940,848	19,344	1,940,848	653,554	980,331	1,633,885	122,328	36,528	158,856	
			5	520,636	164,396	685,032	104,320	242,870	347,190	878,560	1,867,008	2,745,568	1,823,760	18,360	1,842,120	0	0	0	147,813	44,138	191,951	1,867,008	2,745,568	1,823,760	18,360	1,842,120	0	0	147,813	44,138	191,951	
B1T5	5	1	1,019,876	322,036	1,341,912	390,080	908,155	1,298,235	1,673,140	3,555,552	5,228,692	3,684,240	0	0	0	0	0	259,947	77,622	337,569	3,555,552	5,228,692	3,684,240	0	0	0	259,947	77,622	337,569			
			3	240,705	76,005	316,710	71,680	166,880	238,560	684,760	1,455,168	2,139,928	1,411,328	14,208	1,425,536	0	0	0	122,328	36,528	158,856	1,455,168	2,139,928	1,411,328	14,208	1,425,536	0	0	122,328	36,528	158,856	
			2	638,314	201,554	839,868	324,160	754,685	1,078,845	1,717,060	2,240,868	2,987,824	1,947,728	19,608	1,967,336	806,664</																

Table 64 Detailed Construction Cost for the Moratuwa-Rathmalana Area Drainage Channel Improvement (5/9) (Pre-F/S)

Zone	Name	Design scale	Section	Lean concrete			Turf			Concrete pave.			Subtotal			Total			Land acquisition		Land Total (LC (LKR))					
				LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)		Total (LKR)				
A	2R	5	1	529,720	1,125,696	1,655,416	0	0	0	0	0	0	24,385,758	35,213,733	59,599,491	61,830,714	88,840,407	150,671,121	1,188,000	2,728,000						
				206,720	439,296	646,016	0	0	0	0	0	0	8,489,004	10,811,944	19,300,948											
				426,360	906,048	1,332,408	0	0	0	0	0	0	14,685,079	22,612,920	37,297,999											
				180,880	384,384	565,264	0	0	0	0	0	0	7,152,228	9,947,405	17,099,633											
				155,040	329,472	484,512	0	0	0	0	0	0	7,118,645	10,254,405	17,373,050											
				813,960	1,729,728	2,543,688	0	0	0	0	0	0	30,597,679	43,725,661	74,323,340											
				129,200	274,560	403,760	49,555	0	49,555	0	0	0	4,601,687	5,438,778	10,040,465											
				478,040	1,015,872	1,493,912	0	0	0	21,726	2,964	24,690	11,654,442	8,503,887	20,158,329											
				516,800	1,088,240	1,615,040	0	0	0	21,726	2,964	24,690	8,700,781	7,218,027	15,918,808											
				135,660	288,288	423,948	0	0	0	10,863	1,482	12,345	2,744,620	1,933,956	4,678,576											
B	C5	5	1	406,980	864,864	1,271,844	0	0	0	109,021	0	109,021	259,245	12,899,336	9,164,740	22,064,076	18,737,808	32,108,658	48,312,000	66,836,000						
				103,360	219,648	323,008	0	0	0	61,557	8,398	69,955	2,206,065	1,662,744	3,868,809											
				148,580	315,744	464,324	0	0	0	101,388	13,832	115,220	3,632,407	2,543,366	6,175,773											
				290,700	617,760	908,460	0	0	0	0	0	0	7,815,675	5,685,749	13,501,424											
				213,180	453,024	666,204	0	0	0	0	0	0	6,819,618	4,748,966	11,568,584											
				135,660	288,288	423,948	0	0	0	0	0	0	7,251,277	11,167,383	18,418,660											
				96,900	205,920	302,820	0	0	0	0	0	0	3,165,576	2,205,597	5,371,173											
				77,520	164,736	242,256	0	0	0	0	0	0	2,801,510	1,849,000	4,650,510											
				19,380	41,184	60,564	0	0	0	0	0	0	1,116,803	1,644,699	2,761,502											
				206,720	439,296	646,016	0	0	0	0	0	0	5,074,007	3,806,153	8,880,160											
B1	5	5	1	58,140	123,552	181,692	0	0	0	0	0	1,545,862	1,096,773	2,642,635												
				19,380	41,184	60,564	0	0	0	0	0	426,543	334,438	760,981												
				19,380	41,184	60,564	0	0	0	0	0	836,525	1,190,623	2,027,148												
				64,600	137,280	201,880	0	0	0	0	0	1,476,186	1,138,339	2,614,525												
				142,120	302,016	444,136	0	0	0	0	0	6,698,602	9,520,052	16,218,654												
				77,520	164,736	242,256	0	0	0	0	0	1,665,996	1,290,510	2,956,506												
				45,220	96,096	141,316	0	0	0	0	0	864,213	704,132	1,568,345												
				77,520	164,736	242,256	0	0	0	0	0	1,692,723	1,309,935	3,002,658												
				135,660	288,288	423,948	0	0	0	36,210	4,940	41,150	3,085,393	2,260,365	5,345,758											
				187,340	398,112	585,452	0	0	0	0	0	0	4,136,374	3,010,772	7,147,146											
B1T4	5	5	1	329,460	700,128	1,029,588	0	0	0	0	0	11,006,855	13,263,884	24,270,739												
				155,040	329,472	484,512	0	0	0	0	0	2,956,983	2,234,164	5,191,147												
				245,480	521,664	767,144	0	0	0	0	0	7,563,365	9,592,004	17,155,369												
B1T5	5	5	1	213,180	453,024	666,204	0	0	0	0	0	6,446,538	8,263,166	14,709,704												
				329,460	700,128	1,029,588	0	0	0	0	0	13,935,731	19,978,349	33,914,080												
							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Source: JICA Study Team

Table 65 Detailed Construction Cost for the Moratuwa-Rathmalana Area Drainage Channel Improvement (6/9) (Pre-F/S)

2) Quantity for Gabion Wall type channel improvement (1/77)

Zone	Name	Design scale	Section	From (m)	to (m)	Clearing (m ³)	Excavation (m ³)	Dredging (m ³)	Embankment (m ³)	Backfill (m ³)	Spoil (m ³)	Concrete (m ³)	Formwork (m ²)	Rebar (kg)	Gabion (m ³)	Filter (m ²)	Gravel (m ³)	Concrete pavement (m ³)	Base course		For Wall		
																			Concrete (m ³)	FC (m ³)	Concrete (m ³)	Gravel bed. (m ³)	
A	C5	10	1	0	232	1,924	2,061	0	490	599	974	82	241	372	928	1,392	372	87	87	109	557	12	
				3-1	627	701	316	783	0	162	622	27	77	119	296	444	119	6	6	18	89	2	
				3-3	725	774	209	519	0	107	412	18	79	196	294	79	4	4	12	4	12	59	2
B	C4	10	1	0	46	405	549	69	32	101	486	23	68	74	184	276	74	18	18	0	0	0	
				2	774	318	544	1,187	1,855	0	329	2,712	66	199	218	544	816	218	51	51	0	0	0
				3	46	500	0	751	1,895	0	485	2,161	45	133	146	364	546	146	34	34	0	0	0
				4	500	737	242	709	1,149	0	422	1,436	59	174	190	474	711	190	45	45	0	0	0
B1	5	1	0	57	454	971	0	0	237	86	27	84	92	228	342	105	11	11	0	0	0		
			5-1	737	794	150	500	62	165	397	29	84	92	228	342	92	0	0	0	0	0		

2) Quantity for Gabion Wall type channel improvement (2/77)

Zone	Name	Design scale	Section	Concrete (m ³)	Form for wall (m ³)	Gravel bed. (m ³)	Land Acq. (m ²)	Clearing		Excavation		Dredging		Embankment		Backfill		Disposal		Concrete		
								LC (LKR/m ²)	FC (LKR/m ²)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ³)	FC (LKR/m ³)			
A	C5	10	1	52	325	13	1,383	117	117	694	373	126	295	641	640	1,783	563	320	745	6,460	13,728	
				3-1	9	52	2	315	117	117	694	373	126	295	641	640	1,783	563	320	745	6,460	13,728
				3-3	6	35	2	209	117	117	694	373	126	295	641	640	1,783	563	320	745	6,460	13,728
B	C4	10	1	0	0	0	404	117	117	694	373	126	295	641	640	1,783	563	320	745	6,460	13,728	
				2	0	0	544	117	117	694	373	126	295	641	640	1,783	563	320	745	6,460	13,728	
				3	0	0	82	117	117	694	373	126	295	641	640	1,783	563	320	745	6,460	13,728	
				4	0	0	884	117	117	694	373	126	295	641	640	1,783	563	320	745	6,460	13,728	
B1	5	1	0	0	0	150	117	117	694	373	126	295	641	640	1,783	563	320	745	6,460	13,728		
			5-1	0	0	454	117	117	694	373	126	295	641	640	1,783	563	320	745	6,460	13,728		

2) Quantity for Gabion Wall type channel improvement (3/77)

Zone	Name	Design scale	Section	Form		Rebar		Gabion		Filter Cloths		G-foundation rock		Concrete pave.		Base course		Conc. For wall		Form for wall			
				LC (LKR/m ²)	FC (LKR/m ²)	LC (LKR/kg)	FC (LKR/kg)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ²)	FC (LKR/m ²)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ²)	FC (LKR/m ²)		
A	C5	10	1	2,384	24	183	183	9,651	1,838	468	468	0	5,097	1,522	3,621	494	4,742	357	6,460	13,728	2,384	24	
				3-1	2,384	24	183	183	9,651	1,838	468	468	0	5,097	1,522	3,621	494	4,742	357	6,460	13,728	2,384	24
				3-3	2,384	24	183	183	9,651	1,838	468	468	0	5,097	1,522	3,621	494	4,742	357	6,460	13,728	2,384	24
B	C4	10	1	2,384	24	183	183	9,651	1,838	468	468	0	5,097	1,522	3,621	494	4,742	357	6,460	13,728	2,384	24	
				2	2,384	24	183	183	9,651	1,838	468	468	0	5,097	1,522	3,621	494	4,742	357	6,460	13,728	2,384	24
				3	2,384	24	183	183	9,651	1,838	468	468	0	5,097	1,522	3,621	494	4,742	357	6,460	13,728	2,384	24
				4	2,384	24	183	183	9,651	1,838	468	468	0	5,097	1,522	3,621	494	4,742	357	6,460	13,728	2,384	24
B1	5	1	2,384	24	183	183	9,651	1,838	468	468	0	5,097	1,522	3,621	494	4,742	357	6,460	13,728	2,384	24		
			5-1	2,384	24	183	183	9,651	1,838	468	468	0	5,097	1,522	3,621	494	4,742	357	6,460	13,728	2,384	24	

Source: JICA Study Team

Table 66 Detailed Construction Cost for the Moratuwa-Rathmalana Area Drainage Channel Improvement (7/9) (Pre-F/S)

2) Quantity for Gabion Wall type channel improvement (4/7)

Zone Name	Design scale	Section	Gravel bed. for wall			Conc. for u-ditch			Form for u-ditch			Gravel bed. for u-ditch			Land price			Clearing			Excavation			Dredging			
			LC (LKR/m3)	FC (LKR/m3)	Total (LKR/m3)	LC (LKR/m3)	FC (LKR/m3)	Total (LKR/m3)	LC (LKR/m3)	FC (LKR/m3)	Total (LKR/m3)	LC (LKR/m3)	FC (LKR/m3)	Total (LKR/m3)	LC (LKR/m2)	FC (LKR/m2)	Total (LKR/m2)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	
A	C5	10	1	3,504	0	6,460	13,728	2,384	24	3,504	0	44,000	225,108	450,216	1,430,334	768,753	2,199,087	0	0	0	0	0	0	0	0	0	
		3-1	3,504	0	6,460	13,728	2,384	24	3,504	0	44,000	36,972	73,944	543,402	292,059	835,461	0	0	0	0	0	0	0	0	0		
		3-3	3,504	0	6,460	13,728	2,384	24	3,504	0	44,000	24,453	48,906	360,186	193,587	553,773	0	0	0	0	0	0	0	0	0		
B	C4	10	1	3,504	0	6,460	13,728	2,384	24	3,504	0	44,000	47,385	94,770	381,006	204,777	585,783	8,694	20,355	29,049	8,694	20,355	29,049	233,730	547,225	780,955	
		2	3,504	0	6,460	13,728	2,384	24	3,504	0	44,000	63,648	127,296	823,778	442,751	1,266,529	0	0	0	0	0	0	0	801,317	238,770	559,025	797,795
		3	3,504	0	6,460	13,728	2,384	24	3,504	0	44,000	28,314	56,628	492,046	264,457	756,503	144,774	338,955	483,729	144,774	338,955	483,729	347,000	186,500	533,500		
		4	3,504	0	6,460	13,728	2,384	24	3,504	0	44,000	17,550	35,100	347,000	186,500	533,500	7,812	18,290	26,102	7,812	18,290	26,102	673,874	362,183	1,036,057		
		5-1	3,504	0	6,460	13,728	2,384	24	3,504	0	44,000	53,118	106,236	0	0	0	0	0	0	0	0	0	0	0	0		
B1	5	1	3,504	0	6,460	13,728	2,384	24	3,504	0	44,000	53,118	106,236	0	0	0	0	0	0	0	0	0	0	0			

2) Quantity for Gabion Wall type channel improvement (5/7)

Zone Name	Design scale	Section	Embankment			Backfill			Disposal			Concrete			Form			Rebar			Gabion		
			LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)
A	C5	10	1	314,090	627,890	1,068,017	337,237	1,405,254	311,680	725,630	1,037,310	529,720	1,125,696	1,655,416	574,544	5,784	580,328	45,384	68,076	113,460	8,956,128	1,705,864	10,661,792
		3-1	0	0	288,846	91,206	380,052	199,040	463,330	662,430	174,420	370,656	545,076	183,568	1,848	185,416	14,518	21,777	36,295	2,856,696	544,048	3,400,744	
		3-3	0	0	190,781	60,241	251,022	131,840	306,940	438,780	116,280	247,104	363,384	121,584	1,224	122,808	9,638	14,457	24,095	1,891,596	360,248	2,251,844	
B	C4	10	1	20,512	40,992	180,083	56,863	236,946	155,520	362,070	517,590	148,580	315,744	464,324	162,112	1,632	163,744	9,028	13,542	22,570	1,775,784	338,192	2,113,976
		2	0	0	586,607	185,227	771,834	867,840	2,020,440	2,888,280	426,360	906,048	1,332,408	474,416	4,776	479,192	26,596	39,894	66,490	5,250,144	999,872	6,250,016	
		3	0	0	864,755	273,055	1,137,810	691,520	1,609,945	2,301,465	290,700	617,760	908,480	317,072	3,192	320,264	17,812	26,718	44,530	3,512,964	669,032	4,181,996	
		4	0	0	752,426	237,586	990,012	459,520	1,069,820	1,529,340	381,140	809,952	1,191,092	414,816	4,176	418,992	23,180	34,770	57,950	4,574,574	871,212	5,445,786	
		5-1	0	0	294,195	92,895	387,090	127,040	295,765	422,805	187,340	398,112	585,452	200,256	2,016	202,272	11,224	16,836	28,060	2,200,428	419,064	2,619,492	
B1	5	1	0	0	422,571	133,431	556,002	27,520	64,070	91,590	174,420	370,656	545,076	200,256	2,016	202,272	11,224	16,836	28,060	2,200,428	419,064	2,619,492	

2) Quantity for Gabion Wall type channel improvement (6/7)

Zone Name	Design scale	Section	Filter Cloths			G-foundation rock			Concrete pave.			Base course			Conc. For wall			Form for wall			Gravel bed. for wall				
			LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)		
A	C5	10	1	651,456	0	651,456	1,896,084	566,184	2,462,268	315,027	42,978	358,005	412,554	443,613	704,140	1,496,352	2,200,492	1,327,888	13,368	1,341,256	288	42,048	42,336		
		3-1	207,792	0	207,792	606,543	181,118	787,661	21,726	2,964	24,690	28,452	2,142	30,594	116,280	247,104	363,384	212,176	2,136	214,312	48	7,008	7,056		
		3-3	137,592	0	137,592	402,663	120,238	522,901	14,484	1,976	16,460	18,968	1,428	20,396	77,520	164,736	242,256	140,656	1,416	142,072	48	7,008	7,056		
B	C4	10	1	129,168	0	129,168	377,178	112,628	489,806	65,178	8,892	74,070	85,356	6,426	91,782	0	0	0	0	0	0	0	0	0	
		2	381,888	0	381,888	1,111,146	331,796	1,442,942	184,671	25,194	209,865	241,842	18,207	260,049	0	0	0	0	0	0	0	0	0	0	
		3	255,528	0	255,528	744,162	222,212	966,374	123,114	16,796	139,910	161,228	12,138	173,366	0	0	0	0	0	0	0	0	0	0	
		4	332,748	0	332,748	968,430	289,180	1,257,610	162,945	22,230	185,175	213,390	16,065	223,455	0	0	0	0	0	0	0	0	0	0	0
		5-1	160,056	0	160,056	468,924	140,024	608,948	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B1	5	1	160,056	0	160,056	535,185	159,810	694,995	39,831	5,434	45,265	52,162	3,927	56,089	0	0	0	0	0	0	0	0	0	0	

Source: JICA Study Team

Table 67 Detailed Construction Cost for the Moratuwa-Rathmalana Area Drainage Channel Improvement (8/9) (Pre-F/S)

Zone	Name	Design scale	Conc. for u-ditch			Form for u-ditch			Gravel bed. for u-ditch			Subtotal			Total			Land acquisition		Land Total (LKR)	
			LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)	Total (LKR)	LC (LKR)	FC (LKR)		
A	C5	10	1	182,208	0	182,208	0	2,099,500	2,099,500	83,980	178,464	262,444	19,028,630	9,745,501	28,774,131	28,235,798	14,131,917	42,367,715	60,852,000	83,908,000	
			3-1	31,536	0	31,536	0	335,920	335,920	12,920	27,456	40,376	5,534,935	2,627,804	8,162,739				13,860,000		
			3-3	21,024	0	21,024	0	226,100	226,100	12,920	27,456	40,376	3,672,233	1,758,612	5,430,845				9,196,000		
B	C4	10	1	0	0	0	0	0	0	0	0	3,545,584	1,508,986	5,054,570	34,927,197	16,957,829	51,885,026	17,776,000	90,816,000		
			2	0	0	0	0	0	0	0	0	0	10,672,666	5,585,078	16,257,744			23,936,000			
			3	0	0	0	0	0	0	0	0	0	7,738,819	4,289,996	12,028,815			3,608,000			
			4	0	0	0	0	0	0	0	0	0	8,948,303	3,986,717	12,935,020			38,896,000			
B1	5	5-1	1	0	0	0	0	0	0	0	0	4,021,825	1,587,052	5,608,877			6,600,000				
			2	0	0	0	0	0	0	0	0	0	4,550,645	1,590,545	6,141,190	4,550,645	1,590,545	6,141,190	19,976,000	19,976,000	

3) Quantity for gentle slope (1:2.0) channel improvement (1/3)

Zone	Name	Design scale	Section	from	to	Clearing		Excavation		Dredging		Embankment		Spoil		Turf		Concrete pavement		Base course		Land Acq.		Clearing		Excavation		Dredging		Embankment		Disposal				
						LC (LKR/m2)	FC (LKR/m2)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)
A	C5	10	2	232	627	3,586	0	1,912	0	1,321	592	3,634	188	158	1,118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
B	C2B2	5	1	0	163	0	221	0	221	0	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			2	163	287	0	78	0	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3) Quantity for gentle slope (1:2.0) channel improvement (2/3)

Zone	Name	Design scale	Section	Turf		Concrete pave.		Base course		Land price		Clearing		Excavation		Dredging		Embankment		Total		
				LC (LKR/m2)	FC (LKR/m2)	(LKR/m3)	(LKR/m3)	(LKR/m3)	(LKR/m3)	(LKR/m3)	(LKR/m3)	(LKR/m3)	(LKR/m3)	(LKR/m3)	(LKR/m3)	(LKR/m3)	(LKR/m3)	(LKR/m3)	(LKR/m3)	(LKR/m3)	(LKR/m3)	(LKR/m3)
A	C5	10	2	583	0	3,621	494	4,742	357	44,000	419,562	419,562	839,124	0	0	0	0	0	0	0	0	0
B	C2B2	5	1	583	0	3,621	494	4,742	357	44,000	0	0	153,374	82,433	235,807	0	0	0	0	0	0	0
			2	583	0	3,621	494	4,742	357	44,000	0	0	54,132	29,094	83,226	0	0	0	0	0	0	0

3) Quantity for gentle slope (1:2.0) channel improvement (3/3)

Zone	Name	Design scale	Section	Disposal		Turf		Concrete pave.		Base course		Subtotal		Total		Land acquisition		Land Total (LKR)
				LC (LKR)	FC (LKR)	(LKR)	(LKR)	(LKR)	(LKR)	(LKR)	(LKR)	(LKR)	(LKR)	(LKR)	(LKR)	(LKR)	(LKR)	
A	C5	10	2	189,440	441,040	630,480	2,118,622	572,118	78,052	650,170	749,236	56,406	805,642	5,136,651	2,404,540	7,541,191	49,192,000	49,192,000
B	C2B2	5	1	70,720	164,645	235,365	0	0	0	0	0	0	224,094	247,078	471,172	334,282	637,468	0
			2	24,960	58,110	83,070	0	0	0	0	0	0	79,092	87,204	166,296	0	0	0

Source: JICA Study Team

Table 68 Detailed Construction Cost for the Moratuwa-Rathmalana Area Drainage Channel Improvement (9/9) (Pre-F/S)

4) Quantity for SSP Wall type channel improvement (1/5)

Zone Name	Design scale	Section	Clearing		Excavation (m ³)	Dredging (m ³)	Backfill		Spot (m ³)	Concrete (m ³)	Formwork (m ²)	Concrete pavement (m ³)	Base course		For u-ditch		Gravel bed.		SSP (m ²)	Land Acq.		
			from (m)	to (m)			LC (LKR/m ³)	FC (LKR/m ³)					LC (LKR/m ³)	FC (LKR/m ³)	Concrete (m ³)	Form for wall (m ³)	Gravel bed. (m ³)	Gravel bed. (m ³)		LC (LKR/m ²)	FC (LKR/m ²)	
A	C5	10	3-2	701	725	72	29	20	74	18	87	4	4	5	32	1	3	34	1	216	51	117
B	C4	10	5-2	794	820	34	0	38	24	19	94	0	0	0	0	0	0	0	0	286	34	117

4) Quantity for SSP Wall type channel improvement (2/5)

Zone Name	Design scale	Section	Excavation		Dredging	Backfill		Disposal		Concrete		Form		Concrete pave.		Base course		Conc. For wall			
			LC (LKR/m ³)	FC (LKR/m ³)		LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ³)	FC (LKR/m ³)		
A	C5	10	3-2	694	373	126	295	1,783	563	320	745	6,460	13,728	2,384	24	3,621	494	4,742	357	6,460	13,728
B	C4	10	5-2	694	373	126	295	1,783	563	320	745	6,460	13,728	2,384	24	3,621	494	4,742	357	6,460	13,728

4) Quantity for SSP Wall type channel improvement (3/5)

Zone Name	Design scale	Section	Form for wall		Gravel bed. for wall		Conc. for u-ditch		Form for u-ditch		Gravel bed. for u-ditch		SSP		Land price		Clearing		Excavation		Dredging		
			LC (LKR/m ²)	FC (LKR/m ²)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ³)	FC (LKR/m ³)	LC (LKR/m ²)	FC (LKR/m ²)	LC (LKR/m ²)	FC (LKR/m ²)	LC (LKR/m ²)	FC (LKR/m ²)	LC (LKR/m ²)	FC (LKR/m ²)	LC (LKR)	FC (LKR)	LC (LKR)	FC (LKR)	
A	C5	10	3-2	2,384	24	3,504	0	6,460	13,728	2,384	24	3,504	0	7,266	38,147	44,000	8,424	8,424	20,126	10,817	30,943	8,190	27,365
B	C4	10	5-2	2,384	24	3,504	0	6,460	13,728	2,384	24	3,504	0	7,266	38,147	44,000	3,978	3,978	7,956	0	0	7,812	18,290

4) Quantity for SSP Wall type channel improvement (4/5)

Zone Name	Design scale	Section	Backfill		Disposal		Form		Concrete		Form		Concrete pave.		Base course		Conc. For wall		Form for wall					
			LC (LKR)	FC (LKR)	LC (LKR)	FC (LKR)	LC (LKR)	FC (LKR)	LC (LKR)	FC (LKR)	LC (LKR)	FC (LKR)	LC (LKR)	FC (LKR)	LC (LKR)	FC (LKR)	LC (LKR)	FC (LKR)	LC (LKR)	FC (LKR)				
A	C5	10	3-2	35,660	11,260	46,920	23,680	55,130	78,810	116,280	247,104	363,384	207,408	2,088	209,496	1,428	18,368	32,300	68,640	100,940	76,288	768	77,056	
B	C4	10	5-2	67,754	21,394	89,148	7,680	17,880	25,560	122,740	260,832	383,572	224,096	2,256	226,352	0	0	0	0	0	0	0	0	0

4) Quantity for SSP Wall type channel improvement (5/5)

Zone Name	Design scale	Section	Gravel bed. for wall		Conc. for u-ditch		Form for u-ditch		SSP		Subtotal		Total		Land acquisition						
			LC (LKR)	FC (LKR)	LC (LKR)	FC (LKR)	LC (LKR)	FC (LKR)	LC (LKR)	FC (LKR)	LC (LKR)	FC (LKR)	LC (LKR)	FC (LKR)	LC (LKR)	FC (LKR)					
A	C5	10	3-2	24	3,504	10,512	0	10,512	0	219,640	219,640	6,460	13,728	20,188	514,944	1,093,748	1,762,614	668,866	1,762,614	2,244,000	2,244,000
B	C4	10	5-2	0	0	0	0	0	0	681,824	688,688	1,115,884	331,494	1,447,378	1,115,884	331,494	1,447,378	1,496,000	1,496,000	1,496,000	1,496,000

Source: JICA Study Team

Table 69 Detailed Quantity for the Moratuwa-Rathmalana Area Drainage Channel Improvement (1/4) (Pre-F/S)

1) Quantity for U-ditch type channel improvement (1/2)

Zone	Name	Design scale	Section	from (m)	to (m)	Distance (m)	Existing section area (m ²)	Type	Depth (m)	Width (m)	Concrete thickness		Clearing (m/m)	Excavation (m ³ /m)
											Side (m)	Bottom (m)		
A	2R	5	1	0	542	542	1.028	U-shape ditch	1.2	1.0	0.15	0.15	0.00	2.271
			2	542	782	240	1.427	U-shape ditch	1.2	0.8	0.15	0.15	0.00	1.797
			3	782	1043	261	0.384	U-shape ditch	1.2	2.0	0.15	0.15	0.30	4.491
			4	1043	1205	162	1.517	U-shape ditch	1.2	1.2	0.15	0.15	0.00	2.270
			5	1205	1363	158	1.186	U-shape ditch	1.2	1.0	0.15	0.15	0.00	2.171
	2L-1	5	1	0	525	525	1.325	U-shape ditch	1.5	1.9	0.15	0.15	0.00	4.239
			2	525	666	141	0.219	U-shape ditch	1.0	0.8	0.25	0.15	0.75	3.228
			1	0	320	320	1.736	U-shape ditch	1.5	1.8	0.15	0.15	3.34	3.447
			2	320	640	320	1.515	U-shape ditch	1.0	2.0	0.15	0.15	1.49	2.290
			3	640	760	120	1.205	U-shape ditch	1.0	1.0	0.25	0.20	1.89	2.610
B	C5	10	4	774	840	66	1.832	U-shape ditch	2.1	2.1	0.20	0.20	2.73	6.445
			5	0	311	311	0.315	U-shape ditch	1.5	1.6	0.15	0.15	3.54	7.127
			2	311	392	81	0.635	U-shape ditch	1.0	1.3	0.25	0.20	1.68	3.953
			3	392	530	138	0.836	U-shape ditch	1.0	1.0	0.25	0.20	2.64	4.217
			3	287	511	224	1.385	U-shape ditch	1.5	1.5	0.15	0.15	0.00	4.038
	C6	5	1-1	0	153	153	0.899	U-shape ditch	1.7	1.6	0.15	0.15	4.14	7.076
			1-2	153	253	100	0.899	U-shape ditch	1.7	1.6	0.15	0.15	1.91	4.642
			1-3	253	324	71	0.899	U-shape ditch	1.7	1.6	0.15	0.15	4.14	7.076
			2-1	324	392	68	1.209	U-shape ditch	1.7	1.2	0.15	0.15	3.65	5.490
			2-2	392	408	16	1.209	U-shape ditch	1.7	1.2	0.15	0.15	2.29	4.380
B1	5	2	57	182	125	1.689	U-shape ditch	1.5	2.0	0.15	0.15	4.25	5.886	
		3-1	182	229	47	0.885	U-shape ditch	1.2	1.3	0.15	0.15	3.35	4.745	
		3-2	229	244	15	0.885	U-shape ditch	1.2	1.3	0.15	0.15	3.35	2.831	
		3-3	244	259	15	0.885	U-shape ditch	1.2	1.3	0.15	0.15	0.00	4.745	
		3-4	259	312	53	0.885	U-shape ditch	1.2	1.3	0.15	0.15	3.35	2.831	
	B1T4	5	3-5	312	434	122	0.885	U-shape ditch	1.2	1.3	0.15	0.15	0.00	4.745
			4-1	434	496	62	0.277	U-shape ditch	1.0	1.3	0.25	0.20	2.48	5.211
			4-2	496	532	36	0.277	U-shape ditch	1.0	1.3	0.25	0.20	2.48	3.610
			4-3	532	595	63	0.277	U-shape ditch	1.0	1.3	0.25	0.20	2.48	5.211
			5	595	710	115	0.363	U-shape ditch	1.0	0.9	0.25	0.20	2.03	5.442
B1T5	5	1	0	170	170	0.347	U-shape ditch	1.0	1.0	0.25	0.20	2.30	3.628	
		2	170	510	340	0.233	U-shape ditch	1.0	0.8	0.25	0.20	2.01	2.767	
		3	510	670	160	0.242	U-shape ditch	0.8	0.8	0.25	0.20	1.17	2.238	
		1	0	190	190	0.226	U-shape ditch	1.0	1.5	0.15	0.15	6.94	4.209	
		2	190	370	180	0.269	U-shape ditch	1.0	1.1	0.25	0.20	2.58	3.526	
	3	370	670	300	0.114	U-shape ditch	1.0	1.0	0.25	0.20	2.80	4.116		

Source: JICA Study Team

Table 70 Detailed Quantity for the Moratuwa-Rathmalana Area Drainage Channel Improvement (2/4) (Pre-F/S)

1) Quantity for U-ditch type channel improvement (2/2)

Zone	Name	Design scale	Section	SSP retaining wall (m ² /m)	Embankment (m ³ /m)	Backfill (m ³ /m)	Disposal (m ³ /m)	Concrete (m ³ /m)	Form (m ² /m)	Rebar (kg/m)	Gravel (m ³ /m)	Lean concrete (m ³ /m)	Turf (m ² /m)	Concrete Pavement (m ³ /m)
A	2R	5	1	5.000	0.000	1.371	5.900	0.565	5.10	33.9	0.15	0.15	0.00	0.000
			2	3.000	0.000	0.732	4.065	0.535	5.10	32.1	0.13	0.13	0.00	0.000
			3	6.500	0.000	1.397	9.594	0.715	5.10	42.9	0.25	0.25	0.00	0.000
			4	4.500	0.000	1.618	5.152	0.595	5.10	35.7	0.17	0.17	0.00	0.000
			5	5.000	0.000	1.456	5.715	0.565	5.10	33.9	0.15	0.15	0.00	0.000
2L-1	5	1	6.000	0.000	1.727	8.512	0.790	6.30	47.4	0.24	0.24	0.00	0.000	
		2	2.500	0.000	1.675	4.053	0.705	4.50	0.0	0.0	0.14	0.14	0.60	0.000
C	5	1	0.000	0.000	2.794	0.653	0.775	6.30	46.5	0.23	0.23	0.00	0.00	0.017
		2	0.000	0.000	1.675	0.615	0.655	4.30	39.3	0.25	0.25	0.00	0.00	0.017
		3	0.000	0.583	1.375	0.000	0.800	4.50	0.0	0.0	0.17	0.17	0.00	0.017
C5	10	4	0.000	0.000	4.681	1.764	1.350	8.80	81.0	0.26	0.26	0.26	2.83	0.160
		5	0.000	0.000	3.730	3.397	0.745	6.30	44.7	0.20	0.20	0.00	0.00	0.200
C6	5	1	0.000	0.000	2.100	1.853	0.950	4.50	0.0	0.0	0.19	0.19	0.00	0.200
		2	0.000	0.000	2.151	2.066	0.800	4.50	0.0	0.0	0.16	0.16	0.00	0.200
		3	0.000	0.000	2.301	1.737	0.730	6.30	43.8	0.20	0.20	0.00	0.00	0.000
C2B2	5	3	0.000	0.000	4.336	2.740	0.805	7.10	48.3	0.21	0.21	0.00	0.00	0.000
		5	0.000	0.000	2.010	11.632	0.805	7.10	48.3	0.21	0.21	0.00	0.00	0.000
C5	5	1-1	0.000	0.000	4.033	1.457	0.745	7.10	44.7	0.17	0.17	0.00	0.00	0.000
		1-2	9.000	0.000	2.910	1.457	0.745	7.10	44.7	0.17	0.17	0.00	0.00	0.000
		1-3	0.000	0.000	4.336	2.740	0.805	7.10	48.3	0.21	0.21	0.00	0.00	0.000
		2-1	0.000	0.000	2.910	1.457	0.745	7.10	44.7	0.17	0.17	0.00	0.00	0.000
		2-2	9.000	0.000	3.427	2.459	0.805	6.30	48.3	0.25	0.25	0.00	0.00	0.000
B1	5	2	0.000	0.000	3.280	1.465	0.610	5.10	36.6	0.18	0.18	0.00	0.00	0.000
		3-1	0.000	0.000	1.207	1.465	0.610	5.10	36.6	0.18	0.18	0.00	0.00	0.000
		3-2	0.000	0.000	3.280	1.465	0.610	5.10	36.6	0.18	0.18	0.00	0.00	0.000
		3-3	6.500	0.000	1.207	1.465	0.610	5.10	36.6	0.18	0.18	0.00	0.00	0.000
		3-4	0.000	0.000	3.280	1.465	0.610	5.10	36.6	0.18	0.18	0.00	0.00	0.000
3-5	5	3-5	6.500	0.000	3.280	1.465	0.610	5.10	36.6	0.18	0.18	0.00	0.00	0.000
		4-1	0.000	0.000	1.836	3.375	0.860	4.50	0.0	0.0	0.18	0.18	0.00	0.000
		4-2	0.000	0.000	0.880	3.375	0.860	4.50	0.0	0.0	0.18	0.18	0.00	0.000
		4-3	0.000	0.000	1.836	3.375	0.860	4.50	0.0	0.0	0.18	0.18	0.00	0.000
		5	0.000	0.000	1.946	3.496	0.780	4.50	0.0	0.0	0.18	0.18	0.00	0.085
B1T4	5	1	0.000	0.000	1.713	1.915	0.800	4.50	0.0	0.0	0.17	0.17	0.00	0.000
		2	2.500	0.000	1.682	3.585	0.760	4.50	0.0	0.0	0.15	0.15	0.00	0.000
		3	0.000	0.000	0.838	1.400	0.660	3.70	0.0	0.0	0.15	0.15	0.00	0.000
B1T5	5	1	3.000	0.000	1.881	5.328	0.580	4.30	34.8	0.20	0.20	0.00	0.00	0.000
		2	3.000	0.000	1.631	4.895	0.820	4.50	0.0	0.0	0.18	0.18	0.00	0.000
		3	3.000	0.000	2.058	5.058	2.300	4.50	0.0	0.0	0.17	0.17	0.00	0.000

Source: JICA Study Team

Table 71 Detailed Quantity for the Moratuwa-Rathmalana Area Drainage Channel Improvement (3/4) (Pre-F/S)

2) Quantity for Gabion Wall type channel improvement (1/2)																	
Zone	Name	Design scale	Section	from (m)	to (m)	Distance (m)	Existing section area (m2)	Type	Depth (m)	Width (m)	Clearing (m/m)	Excavation (m3/m)	Dredging (m3/m)	Embankment (m3/m)	Backfill (m3/m)	Disposal (m3/m)	Concrete (m3/m)
A	C5	10	1	0	232	232	14.343	Gabion wall	1.8	9.8	8.29	8.882	0.000	2.109	2.578	4.195	0.352
			3-1	627	701	74	4.897	Gabion wall	1.8	4.5	4.26	10.575	0.000	0.000	2.182	8.393	0.352
			3-3	725	774	49	4.897	Gabion wall	1.8	4.5	4.26	10.575	0.000	0.000	2.182	8.393	0.352
B	C4	10	1	0	46	46	13.311	Gabion wall	1.8	11.8	8.79	11.933	1.492	0.686	2.192	10.547	0.482
			2	46	318	272	13.311	Gabion wall	1.8	11.8	2.00	4.361	6.817	0.000	1.208	9.970	0.241
			3	318	500	182	7.935	Gabion wall	1.8	10.3	0.00	4.125	10.411	0.000	2.663	11.873	0.247
			4	500	737	237	7.935	Gabion wall	1.8	7.3	1.02	2.990	4.848	0.000	1.779	6.059	0.247
B1		5	5-1	737	794	57	6.53	Gabion wall	1.8	5.3	2.63	8.767	1.076	0.000	2.886	6.957	0.495
			1	0	57	1.398	Gabion wall	1.7	4.7	7.96	17.020	0.000	0.000	4.149	12.871	0.466	

2) Quantity for Gabion Wall type channel improvement (2/2)																	
Zone	Name	Design scale	Section	Form (m2/m)	Rebar (kg/m)	Gabion (m3/m)	Filter Cloths (m2/m)	Gravel (m3/m)	Concrete Pavement (m3/m)	Base Course (m3/m)	For wall			For u-ditch			
											Concrete (m3/m)	Form (m2/m)	Gravel (m3/m)	Concrete (m3/m)	Form (m2/m)	Gravel (m3/m)	
A	C5	10	1	1.035	1.6	4.0	6.0	1.60	0.374	0.374	0.374	0.467	2.400	0.050	0.220	1.400	0.054
			3-1	1.035	1.6	4.0	6.0	1.60	0.070	0.072	0.234	1.200	0.025	0.110	0.700	0.027	
			3-3	1.035	1.6	4.0	6.0	1.60	0.070	0.072	0.234	1.200	0.025	0.110	0.700	0.027	
B	C4	10	1	1.460	1.6	4.0	6.0	1.60	0.374	0.374	0.374	0.000	0.000	0.000	0.000	0.000	0.000
			2	0.730	0.8	2.0	3.0	0.80	0.186	0.186	0.000	0.000	0.000	0.000	0.000	0.000	
			3	0.730	0.8	2.0	3.0	0.80	0.186	0.186	0.000	0.000	0.000	0.000	0.000	0.000	
			4	0.730	0.8	2.0	3.0	0.80	0.186	0.186	0.000	0.000	0.000	0.000	0.000	0.000	
B1		5	5-1	1.460	1.6	4.0	6.0	1.60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
			1	1.460	1.6	4.0	6.0	1.83	0.186	0.186	0.000	0.000	0.000	0.000	0.000	0.000	

Source: JICA Study Team

Table 72 Detailed Quantity for the Moratuwa-Rathmalana Area Drainage Channel Improvement (4/4) (Pre-F/S)

3) Quantity for gentle slope (1:2.0) channel improvement

Zone	Name	Design scale	Section	from (m)	to (m)	Distance (m)	Existing section area (m ²)	Type	Depth (m)	Width (m)	Clearing (m/m)	Excavation (m ³ /m)	Dredging (m ³ /m)	Embankment (m ³ /m)	Disposal (m ³ /m)	Turf (m ² /m)	Concrete Pavement (m ³ /m)	Base Course (m ³ /m)
A	C5	10	2	232	627	395	5.19	Turf	1.8	9.7	9.08	0.000	4.840	3.342	1.498	9.20	0.400	0.400
B	C2B2	5	1	0	163	163	-	Dredging	1.5	8.0	0.000	1.352	0.000	0.000	1.352	0.00	0.000	0.000
			2	163	287	124	-	Dredging	1.5	5.0	0.000	0.627	0.000	0.000	0.627	0.00	0.000	0.000

4) Quantity for SSP Wall type channel improvement (1/2)

Zone	Name	Design scale	Section	from (m)	to (m)	Distance (m)	Existing section area (m ²)	Type	Depth (m)	Width (m)	Clearing (m/m)	Excavation (m ³ /m)	Dredging (m ³ /m)	Backfill (m ³ /m)	Disposal (m ³ /m)	Concrete (m ³ /m)	Form (m ² /m)	Concrete Pavement (m ³ /m)	Base Course (m ³ /m)
A	C5	10	3-2	701	725	24	4.897	SSP Wall	1.4	3.6	2.99	1.190	2.697	0.815	3.072	0.720	3.600	0.140	0.140
B	C4	10	5-2	794	820	26	13.311	SSP Wall	1.8	4.4	1.29	0.000	2.349	1.449	0.900	0.720	3.600	0.000	0.000

4) Quantity for SSP Wall type channel improvement (2/2)

Zone	Name	Design scale	Section	For wall			For u-ditch			SSP (m/m)
				Concrete (m ³ /m)	Form (m ² /m)	Gravel (m ³ /m)	Concrete (m ³ /m)	Form (m ² /m)	Gravel (m ³ /m)	
A	C5	10	3-2	0.189	1.303	0.025	0.110	1.400	0.028	9.000
B	C4	10	5-2	0.000	0.000	0.000	0.000	0.000	0.000	11.000

Source: JICA Study Team

Table 73 Land Acquisition and Compensation Cost for the Moratuwa-Rathmalana Area Drainage Channel Improvement (Pre-F/S)

Land Acquisition and Compensation for M-R area drainage improve

Description	Cost	
	LC (LKR)	FC (LKR)
Land Acquisition	652,300,000	0
Affected building compensation	46,014,619	0
Land acquisition for resettlement	0	0
Total	698,314,619	0

Source: JICA Study Team

Table 74 Land Acquisition Cost for the Moratuwa-Rathmalana Area Drainage Channel Improvement (Pre-F/S)

Canal Name	Land Acquisition Cost		
	LC	FC	Total
A-2R	2,728,000	0	2,728,000
A-2L-1	4,664,000	0	4,664,000
A-C	70,664,000	0	70,664,000
A-C5	143,308,000	0	143,308,000
A-C6	66,836,000	0	66,836,000
B-C2B2	16,852,000	0	16,852,000
B-C5	59,224,000	0	59,224,000
B-B1	53,988,000	0	53,988,000
B-B1T4	59,884,000	0	59,884,000
B-B1T5	81,840,000	0	81,840,000
B-C4	92,312,000	0	92,312,000
Total	652,300,000	0	652,300,000

Table 75 Land Acquisition Quantity for the Moratuwa-Rathmalana Area Drainage Channel Improvement (Pre-F/S)

Zone	Name	Design scale	Section	from (m)	to (m)	Distance (m)	Type	Depth (m)	Width (m)	Conc. thickness Side (m)	Affected area		Exist. Channel width (m)	Land Acquisition			
											Left (m)	Right (m)		Left (m)	Right (m)	Both (m)	
A	2R	5	1	0	542	542	U-shape ditch	1.2	1.0	0.15	1.36	1.89	2.78	0.00	0.05	0.05	
				2	542	782	240	U-shape ditch	1.2	0.8	0.15	1.31	1.34	2.71	0.00	0.00	0.00
				3	782	1043	261	U-shape ditch	1.2	2.0	0.15	1.65	1.65	3.54	0.00	0.00	0.00
				4	1043	1205	162	U-shape ditch	1.2	1.2	0.15	2.07	0.29	5.03	0.00	0.00	0.00
				5	1205	1363	158	U-shape ditch	1.2	1.0	0.15	1.37	1.89	3.31	0.22	0.00	0.22
	2L-1	5	1	0	525	525	U-shape ditch	1.5	1.9	0.15	1.91	1.94	5.12	0.00	0.00	0.00	
				2	525	666	141	U-shape ditch	1.0	0.8	0.25	1.13	1.76	2.14	0.00	0.75	0.75
				3	640	760	120	U-shape ditch	1.0	1.0	0.25	2.61	2.31	1.13	0.21	1.68	1.89
				4	774	840	66	U-shape ditch	2.1	2.1	0.20	3.59	3.15	4.01	1.59	1.15	2.74
				5	840	911	71	U-shape ditch	1.5	1.6	0.15	2.88	2.89	2.24	1.76	1.77	3.53
C	5	1	0	320	320	U-shape ditch	1.5	1.8	0.15	2.67	2.86	2.19	1.58	1.76	3.34		
			2	320	640	320	U-shape ditch	1.0	2.0	0.15	2.17	2.64	3.85	0.25	0.72	0.97	
			3	640	760	120	U-shape ditch	1.0	1.0	0.25	2.61	2.31	1.13	0.21	1.68	1.89	
			4	774	840	66	U-shape ditch	2.1	2.1	0.20	3.59	3.15	4.01	1.59	1.15	2.74	
			5	840	911	71	U-shape ditch	1.5	1.6	0.15	2.88	2.89	2.24	1.76	1.77	3.53	
	C5	10	4	774	840	66	U-shape ditch	2.1	2.1	0.20	3.59	3.15	4.01	1.59	1.15	2.74	
				840	911	71	U-shape ditch	1.5	1.6	0.15	2.88	2.89	2.24	1.76	1.77	3.53	
				911	992	81	U-shape ditch	1.0	1.3	0.25	2.32	2.38	2.96	0.84	0.90	1.74	
				992	1073	81	U-shape ditch	1.0	1.0	0.25	2.15	2.12	2.24	1.03	1.00	2.03	
				1073	1154	81	U-shape ditch	1.0	1.0	0.25	2.15	2.12	2.24	1.03	1.00	2.03	
B	C2B2	5	3	287	511	224	U-shape ditch	1.5	1.5	0.15	2.46	1.49	2.11	1.71	0.00	1.71	
				511	627	116	U-shape ditch	1.7	1.6	0.15	2.79	2.95	1.60	1.93	2.22	4.15	
				627	743	116	U-shape ditch	1.7	1.6	0.15	2.79	2.95	1.60	1.93	2.22	4.15	
				743	859	116	U-shape ditch	1.7	1.6	0.15	2.79	2.95	1.60	1.93	2.22	4.15	
				859	975	116	U-shape ditch	1.7	1.6	0.15	2.79	2.95	1.60	1.93	2.22	4.15	
	C5	5	1-1	0	153	153	U-shape ditch	1.7	1.6	0.15	2.79	2.95	1.60	1.93	2.22	4.15	
				1-2	153	253	100	U-shape ditch	1.7	1.6	0.15	1.45	1.45	1.60	0.59	0.72	1.31
				1-3	253	324	71	U-shape ditch	1.7	1.6	0.15	2.79	2.95	1.60	1.93	2.22	4.15
				2-1	324	392	68	U-shape ditch	1.7	1.2	0.15	2.63	2.54	1.52	1.76	1.89	3.65
				2-2	392	408	16	U-shape ditch	1.7	1.2	0.15	1.27	2.54	1.52	0.40	1.89	2.29
	B1	5	2	57	182	125	U-shape ditch	1.5	2.0	0.15	2.76	2.91	1.42	0.46	0.72	1.18	
				182	229	47	U-shape ditch	1.2	1.3	0.15	2.50	2.45	2.98	0.56	0.43	0.99	
				229	244	15	U-shape ditch	1.2	1.3	0.15	1.21	1.31	2.98	0.00	0.00	0.00	
				244	259	15	U-shape ditch	1.2	1.3	0.15	2.50	2.45	2.98	0.56	0.43	0.99	
				259	312	53	U-shape ditch	1.2	1.3	0.15	1.21	1.31	2.98	0.00	0.00	0.00	
		B1T4	5	1	0	170	170	U-shape ditch	1.0	1.0	0.25	2.82	0.52	0.82	2.30	0.00	2.30
					170	510	340	U-shape ditch	1.0	0.8	0.25	2.39	0.52	0.82	2.01	0.20	2.21
					510	670	160	U-shape ditch	0.8	0.8	0.25	1.53	0.53	0.70	1.17	0.20	1.37
					670	190	190	U-shape ditch	1.0	1.5	0.15	0.89	2.84	0.88	0.47	2.47	2.94
					190	370	180	U-shape ditch	1.0	1.1	0.25	0.72	2.64	0.78	0.31	2.27	2.58
B1T5	5	1	0	190	190	U-shape ditch	1.0	1.5	0.15	0.89	2.84	0.88	0.47	2.47	2.94		
			190	370	180	U-shape ditch	1.0	1.1	0.25	0.72	2.64	0.78	0.31	2.27	2.58		
			370	670	300	U-shape ditch	1.0	1.0	0.25	0.77	2.74	0.72	0.34	2.45	2.79		

2) Quantity for Gabion Wall type channel improvement

Zone	Name	Design scale	Section	from (m)	to (m)	Distance (m)	Type	Depth (m)	Width (m)	Conc. thickness Side (m)	Affected area		Exist. Channel width (m)	Land Acquisition			
											Left (m)	Right (m)		Left (m)	Right (m)	Both (m)	
A	C5	10	1	0	232	232	Gabion wall	1.8	9.8	0.00	9.15	9.15	9.46	2.08	3.88	5.96	
				3-1	627	701	74	Gabion wall	1.8	4.5	0.00	4.35	3.89	3.99	2.69	1.57	4.26
				3-3	725	774	49	Gabion wall	1.8	4.5	0.00	4.35	3.89	3.99	2.69	1.57	4.26
B	C4	10	1	0	46	46	Gabion wall	1.8	11.8	0.00	8.45	10.39	10.03	3.43	5.36	8.79	
				2	46	318	272	Gabion wall	1.8	11.8	0.00	9.07	6.06	11.07	2.00	0.00	2.00
				3	318	500	182	Gabion wall	1.8	10.3	0.00	8.38	6.12	11.07	0.45	0.00	0.45
				4	500	737	237	Gabion wall	1.8	7.3	0.00	6.74	4.41	7.44	1.02	2.71	3.73
				5-1	737	794	57	Gabion wall	1.8	5.3	0.00	3.98	4.81	6.17	0.90	1.73	2.63
B1	5	1	0	57	57	Gabion wall	1.7	4.7	0.00	9.28	1.31	2.67	7.96	0.00	7.96		

3) Quantity for gentle slope (1:2.0) channel improvement

Zone	Name	Design scale	Section	from (m)	to (m)	Distance (m)	Type	Depth (m)	Width (m)	Conc. thickness Side (m)	Affected area		Exist. Channel width (m)	Land Acquisition		
											Left (m)	Right (m)		Left (m)	Right (m)	Both (m)
A	C5	10	2	232	627	395	Turf	1.8	9.7	0.00	8.09	7.85	13.19	2.83	0.00	2.83
B	C2B2	5	1	0	163	163	Dredging	1.5	8.0	0.00	2.30	1.48	6.94	0.00	0.00	0.00
				2	163	287	124	Dredging	1.5	5.0	0.00	1.70	1.35	6.10	0.00	0.00

4) Quantity for SSP Wall type channel improvement

Zone	Name	Design scale	Section	from (m)	to (m)	Distance (m)	Type	Depth (m)	Width (m)	Conc. thickness Side (m)	Affected area		Exist. Channel width (m)	Land Acquisition		
											Left (m)	Right (m)		Left (m)	Right (m)	Both (m)
A	C5	10	3-2	701	725	24	SSP Wall	1.4	3.6	0.00	3.90	3.08	4.87	1.38	0.73	2.11
B	C4	10	5-2	794	820	26	SSP Wall	1.8	4.4	0.00	4.41	3.05	6.17	0.98	0.31	1.29

Note: It was assumed that no cost for land acquisition along 2R and 2L-1 in Zone A, B1T5 and B1T4 in Zone B was required since it is the public roads.

Source: JICA Study Team

Table 76 Detailed Compensation Cost for the Moratuwa-Rathmalana Area Drainage Channel Improvement (Pre-F/S)

Affected building compensation

M-R area drainage improvement

ID	Structure area (m2)	Affected area (m2)	Affected rate (%)	Compensation unit price (LC, LKR/m2)	Compensation unit price (FC, LKR/m3)	Compensation (LC, LKR)	Compensation (FC, LKR)	Type of use	Relocation
1	34.21	1.88	6%	29,000	0	54,636	0	House	No
2	26.06	20.63	79%	29,000	0	755,673	0	House	Yes
3	41.86	39.88	95%	29,000	0	1,213,795	0	House	Yes
4	10.92	5.21	48%	29,000	0	316,680	0	Storage	No
5	112.05	4.40	4%	29,000	0	127,484	0	House	No
6	518.26	19.87	4%	29,000	0	576,230	0	Army facility	No
7	37.12	37.12	100%	29,000	0	1,076,466	0	House	Yes
8	73.49	22.16	30%	29,000	0	2,131,239	0	House	Yes
9	136.56	45.57	33%	29,000	0	3,960,211	0	House	Yes
10	35.14	7.10	20%	29,000	0	1,018,973	0	House	Yes
11	166.32	39.39	24%	29,000	0	4,823,338	0	House	Yes
12	100.05	35.39	35%	29,000	0	2,901,450	0	House	Yes
13	110.57	110.57	100%	29,000	0	3,206,661	0	House	Yes
14	30.58	23.63	77%	29,000	0	886,837	0	House	Yes
15	108.57	12.43	11%	29,000	0	3,148,472	0	House	Yes
16	86.35	57.73	67%	29,000	0	2,504,170	0	Storage	No
17	71.30	36.25	51%	29,000	0	2,067,671	0	House	Yes
18	87.77	13.41	15%	29,000	0	2,545,446	0	House	Yes
19	21.32	8.73	41%	29,000	0	618,309	0	House	Yes
20	62.85	20.79	33%	29,000	0	1,822,592	0	House	Yes
21	246.77	25.00	10%	29,000	0	7,156,330	0	House	Yes
22	145.18	12.48	9%	29,000	0	361,862	0	House	No
23	292.64	11.41	4%	29,000	0	330,803	0	House	No
24	80.76	7.71	10%	29,000	0	223,503	0	House	No
25	108.42	10.39	10%	29,000	0	301,252	0	House	No
26	36.03	26.40	73%	29,000	0	1,044,725	0	House	Yes
27	19.20	14.10	73%	29,000	0	556,800	0	House	Yes
28	85.73	4.66	5%	29,000	0	135,024	0	House	No
29	124.22	5.10	4%	29,000	0	147,987	0	House	No
						46,014,619			Yes: 18nos

Source: JICA Study Team

Table 77 Unit Price List (1/2) (Pre-F/S)

Unit Price List

Description	Unit	Price Composition		Unit Price				Remarks
		LC	FC	Total	w/ indirect	LC	FC	
Backfill	LKR/m3	70%	30%	2,375	2,779	1,945	834	indirect cost: 17%
Base Course	LKR/m3	74%	26%	7,835	9,167	6,784	2,383	
Canal Bank Clearing	LKR/m2	100%	0%	25	29	29	0	
Compacted Pavement	LKR/m3	91%	9%	4,035	4,721	4,296	425	
Concrete for Parapet Wall	LKR/m3	29%	71%	51,925	60,752	17,618	43,134	
Concrete for Top	LKR/m3	29%	71%	51,925	60,752	17,618	43,134	
Concrete for U-ditch	LKR/m3	29%	71%	51,925	60,752	17,618	43,134	
Concrete for Wall	LKR/m3	29%	71%	51,925	60,752	17,618	43,134	
Concrete Pavement	LKR/m3	29%	71%	51,925	60,752	17,618	43,134	
Coping Concrete (incl. formwork)	LKR/m	68%	32%	39,132	45,784	31,133	14,651	
Cutting of Top Soil Layer	LKR/m3	30%	70%	575	673	202	471	
Disposal of soil (Kalu Oya)	LKR/m3	30%	70%	1,255	1,468	440	1,028	15km distance
Disposal of soil (Bolgoda)	LKR/m3	30%	70%	1,980	2,317	695	1,622	35km distance
Dowel Bar	LKR/m	32%	68%	2,010	2,352	753	1,599	
Dredging	LKR/m3	30%	70%	845	989	297	692	
Embankment	LKR/m3	42%	58%	2,565	3,001	1,260	1,741	
Excavation	LKR/m3	59%	41%	1,510	1,767	1,043	724	
Filter Cloths	LKR/m2	100%	0%	610	714	714	0	
Formwork for Parapet Wall	LKR/m2	96%	4%	2,935	3,434	3,297	137	
Formwork for Top	LKR/m2	96%	4%	2,935	3,434	3,297	137	
Formwork for U-ditch	LKR/m2	96%	4%	2,935	3,434	3,297	137	
Formwork for Wall	LKR/m2	96%	4%	2,935	3,434	3,297	137	
Gabion Foundation Rock	LKR/m3	100%	0%	11,555	13,519	13,519	0	
Gabion with Rock	LKR/m3	47%	53%	28,905	33,819	15,895	17,924	
Gravel Bedding for U-ditch	LKR/m3	67%	33%	8,220	9,617	6,443	3,174	
Gravel Bedding for Wall	LKR/m3	67%	33%	8,220	9,617	6,443	3,174	
Kerb	LKR/m	50%	50%	7,600	8,892	4,446	4,446	
Riprap	LKR/m3	96%	4%	12,245	14,327	13,754	573	
Site Clearing	LKR/m2	94%	6%	385	450	423	27	
Supply and Installation of SSP (land)	LKR/m2	12%	88%	116,893	136,765	16,412	120,353	
Turf	LKR/m2	100%	0%	745	872	872	0	
Add: Temporary SSP (land)	LKR/m2	22%	78%	16,050	18,779	4,131	14,648	
Add: Rebar	LKR/kg	40%	60%	260.75	305	122	183	

Source: Unit Price Analysis Sheet from SLLDC in 2022

Description	Labor		Equipment		Material		Total		Ratio		
	LC	FC	LC	FC	LC	FC	LC	FC	LC	FC	
Backfill	3,750.00	0.00	864.00	2,016.00	93.75	0.00	4,707.75	2,016.00	70%	30%	
Base Course	7,500.00	0.00	90,456.00	211,064.00	494,887.30	0.00	592,843.30	211,064.00	74%	26%	
Canal Bank Clearing	1,250.00	0.00	0.00	0.00	31.25	0.00	1,281.25	0.00	100%	0%	
Compacted Pavement	2,500.00	0.00	487.50	1,137.50	8,512.50	0.00	11,500.00	1,137.50	91%	9%	
Concrete for Parapet Wall	13,000.00	0.00	0.00	0.00	22,781.97	88,747.88	35,781.97	88,747.88	29%	71%	
Concrete for Top	13,000.00	0.00	0.00	0.00	22,781.97	88,747.88	35,781.97	88,747.88	29%	71%	
Concrete for U-ditch	13,000.00	0.00	0.00	0.00	22,781.97	88,747.88	35,781.97	88,747.88	29%	71%	
Concrete for Wall	13,000.00	0.00	0.00	0.00	22,781.97	88,747.88	35,781.97	88,747.88	29%	71%	
Concrete Pavement	13,000.00	0.00	0.00	0.00	22,781.97	88,747.88	35,781.97	88,747.88	29%	71%	
Coping Concrete (incl. formwork)	-	-	-	-	-	-	-	-	-	68%	32%
Cutting of Top Soil Layer	0.00	0.00	174.33	406.78	0.00	0.00	174.33	406.78	30%	70%	
Disposal of soil (Kalu Oya)	0.00	0.00	370.51	864.51	0.00	0.00	370.51	864.51	30%	70%	
Disposal of soil (Bolgoda)	0.00	0.00	584.87	1,364.71	0.00	0.00	584.87	1,364.71	30%	70%	
Dowel Bar	2,750.00	0.00	0.00	0.00	968.75	7,884.00	3,718.75	7,884.00	32%	68%	
Dredging	0.00	0.00	252.35	588.82	0.00	0.00	252.35	588.82	30%	70%	
Embankment	1,250.00	0.00	1,796.25	4,191.25	0.00	0.00	3,046.25	4,191.25	42%	58%	
Excavation	625.00	0.00	259.09	604.55	0.00	0.00	884.09	604.55	59%	41%	
Filter Cloths	2,500.00	0.00	0.00	0.00	4,798.08	0.00	7,298.08	0.00	100%	0%	
Formwork for Parapet Wall	2,062.50	0.00	0.00	0.00	2,736.34	206.08	4,798.84	206.08	96%	4%	
Formwork for Top	2,062.50	0.00	0.00	0.00	2,736.34	206.08	4,798.84	206.08	96%	4%	
Formwork for U-ditch	2,062.50	0.00	0.00	0.00	2,736.34	206.08	4,798.84	206.08	96%	4%	
Formwork for Wall	2,062.50	0.00	0.00	0.00	2,736.34	206.08	4,798.84	206.08	96%	4%	
Gabion Foundation Rock	10,500.00	0.00	0.00	0.00	25,200.00	0.00	35,700.00	0.00	100%	0%	
Gabion with Rock	10,500.00	0.00	6,825.00	15,925.00	64,062.08	75,675.60	81,387.08	91,600.60	47%	53%	
Gravel Bedding for U-ditch	2,500.00	0.00	3,424.50	7,990.50	10,000.00	0.00	15,924.50	7,990.50	67%	33%	
Gravel Bedding for Wall	2,500.00	0.00	3,424.50	7,990.50	10,000.00	0.00	15,924.50	7,990.50	67%	33%	
Kerb									96%	4%	
Riprap	0.00	0.00	1,527.75	3,564.75	86,662.50	0.00	88,190.25	3,564.75	96%	4%	
Site Clearing	7,500.00	0.00	28,135.00	2,275.00	187.50	0.00	35,822.50	2,275.00	94%	6%	
Supply and Installation of SSP (land)	-	-	-	-	-	-	-	-	12%	88%	
Turf	1,015.00	0.00	0.00	0.00	5,920.55	0.00	6,935.55	0.00	100%	0%	
Add: Temporary SSP (land)	-	-	-	-	-	-	-	-	22%	78%	
Add: Rebar	4,300.00	0.00	0.00	0.00	873.76	7,863.79	5,173.76	7,863.79	40%	60%	

Source: Unit Price Analysis Sheet from SLLD Source: Unit Price Analysis Sheet from SLLDC in 2022

Table 78 Unit Price List (2/2) (Pre-F/S)

Supply and Installation of SSP from ground side (0.4m x 12m, 8nos)	Labor		Equipment		Material		Total		Ratio	
	LC	FC	LC	FC	LC	FC	LC	FC	LC	FC
SSP					349,009.92	3,141,089.28	349,009.92	3,141,089.28	10%	90%
allow					2,400.00	21,600.00	2,400.00	21,600.00	10%	90%
Hauling			14,798.88	34,530.72			14,798.88	34,530.72	30%	70%
Excavator			22,800.00	53,200.00			22,800.00	53,200.00	30%	70%
Labor	3,000.00						3,000.00	0.00	100%	0%
Labor	10,000.00						10,000.00	0.00	100%	0%
Tool					325.00		325.00	0.00	100%	0%
Grease					985.60	3,942.40	985.60	3,942.40	20%	80%
Crawler crane			21,600.00	50,400.00			21,600.00	50,400.00	30%	70%
Vibrator w/ cut and weld			28,800.00	67,200.00			28,800.00	67,200.00	30%	70%
Labor	15,000.00						15,000.00	0.00	100%	0%
Paint					64,800.00	583,200.00	64,800.00	583,200.00	10%	90%
Total	28,000.00	0.00	87,998.88	205,330.72	417,520.52	3,749,831.68	533,519.40	3,955,162.40	12%	88%

Source: Unit Price Analysis Sheet from SLLDC in 2022 per sq. 1

Coping Concrete (incl. formwork)	Labor		Equipment		Material		Total		Ratio	
	LC	FC	LC	FC	LC	FC	LC	FC	LC	FC
Concrete (60cm x 60cm)							62.10	144.90	30%	70%
Formwork (60cm x 3 sides)							21,159.36	881.64	96%	4%
Reinforcement (70kg/1m3 of conc.)					5,402.88	11,481.12	5,402.88	11,481.12	32%	68%
Total	0.00	0.00	0.00	0.00	5,402.88	11,481.12	26,624.34	12,507.66	68%	32%

Source: Unit Price Analysis Sheet from SLLDC in 2022

Kerb	Labor		Equipment		Material		Total		Ratio	
	LC	FC	LC	FC	LC	FC	LC	FC	LC	FC
Concrete (60cm x 60cm)							12,471.86	30,534.54	29%	71%
Formwork (60cm x 3 sides)							20,334.78	847.28	96%	4%
Others	13,500.00	0.00	513.60	1,198.40	10,267.10	24,310.40	24,280.70	25,508.80	49%	51%
Total	13,500.00	0.00	513.60	1,198.40	10,267.10	24,310.40	57,087.33	56,890.63	50%	50%

Source: Unit Price Analysis Sheet from SLLDC in 2022

Add: Temporary SSP (land)	Labor		Equipment		Material		Total		Ratio	
	LC	FC	LC	FC	LC	FC	LC	FC	LC	FC
SSP (10-time-use)			375.00	875.00	34,900.99	314,108.93	35,275.99	314,983.93	10%	90%
allow					2,400.00	21,600.00	2,400.00	21,600.00	10%	90%
Labor	5,400.00						5,400.00	0.00	100%	0%
Boom Trk			4,500.00	10,500.00			4,500.00	10,500.00	30%	70%
Labor	3,600.00						3,600.00	0.00	100%	0%
Excavator			8,880.00	20,720.00			8,880.00	20,720.00	30%	70%
Labor	2,500.00						2,500.00	0.00	100%	0%
Labor	7,200.00						7,200.00	0.00	100%	0%
Tool					291.00		291.00	0.00	100%	0%
Grease					656.00	2,624.00	656.00	2,624.00	20%	80%
Crawler crane (50 ton)			15,000.00	35,000.00			15,000.00	35,000.00	30%	70%
Vibrator w/ cut and weld			16,800.00	39,200.00			16,800.00	39,200.00	30%	70%
Labor	10,800.00						10,800.00	0.00	100%	0%
Crawler crane (50 ton) for pulling			7,500.00	17,500.00			7,500.00	17,500.00	30%	70%
Vibrator for pulling			8,400.00	19,600.00			8,400.00	19,600.00	30%	70%
Labor for pulling	5,400.00						5,400.00	0.00	100%	0%
Total	34,900.00	0.00	61,455.00	143,395.00	38,247.99	338,332.93	134,602.99	481,727.93	22%	78%

Source: Unit Price Analysis Sheet from SLLDC in 2022 Total per sqm = 16,050.28

Appendix-2
Drainage Facility Ledger

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CHAPTER 1 INTRODUCTION

This inventory of drainage facilities was organized on the premise that SLLDC would use it as basic data for conducting maintenance and management of channels and hydraulic analysis. For this purpose, it is desirable that this ledger be regularly updated with the latest information.

CHAPTER 2 KALU OYA AND MUDUN ELA BASIN

2.1 Location Map of Drainage Facilities in Kalu Oya and Mudun Ela Basins

Figure 2.1.1 shows the locations of drainage facilities in the Kalu Oya and Mudun Ela basins. These facilities were confirmed in the JICA 2003 M/P, the 2017 survey results conducted by SLLDC, the 2018 F/S, and the field survey.

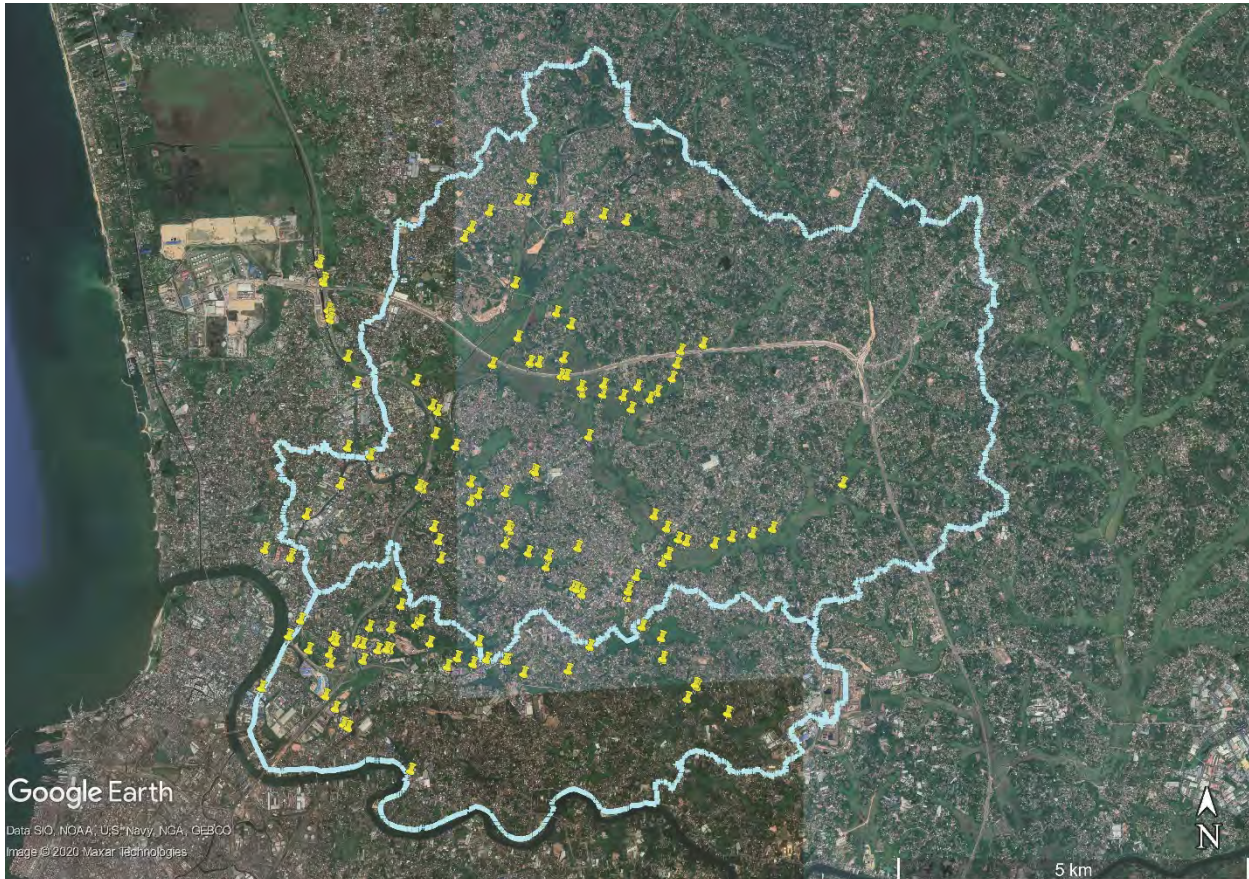


Figure 2.1.1 Location Map of Drainage Facilities in Kalu Oya and Mudun Ela Basins

2.2 Coordinates of Drainage Facilities in Kalu Oya and Mudun Ela Basins

Table 2.2.1 shows the coordinates of drainage facilities in the Kalu Oya and Mudun Ela basins.

Table 2.2.1 Coordinates of Drainage Facilities in Kalu Oya and Mudun Ela Basins

No.	ID			COORDINATE	
	JICA 2003 M/P	SLLDC 2017	2018 F/S	E	N
Kalu Oya					
K-01			KO-01	79.882438	6.982829
K-02	Gate at 14+989		KO-22	79.885707	6.981756
K-03	Bridge at 14+944		KO-23	79.885858	6.982055
K-04	Bridge at 14+327		KO-02	79.887829	6.987216
K-05	Bridge at 13+660		KO-03	79.892161	6.991142
K-06	Bridge at 12+813		KO-04	79.896119	6.994877
K-07			KO-05	79.904484	6.997601
K-08	Bridge at 11+065		KO-06	79.904809	7.00054
K-09			KO-07	79.904101	7.001212
K-10			KO-08	79.90205	7.00442
K-11	Bridge at 9+220		KO-09	79.911878	7.006621
K-12	Anicut at 8+146		KO-10	79.92077	7.005122
K-13	Bridge at 8+031		KO-11	79.921464	7.005091
K-14			KO-12	79.923349	7.003656
K-15			KO-13	79.923473	7.002826
K-16	Bridge at 6+940.8		KO-14	79.924317	6.99734
K-17	Anicut at 5+498			79.932787	6.98716
K-18	Bridge at 5+179		KO-15	79.934401	6.985579
K-19	Anicut at 4+913		KO-17	79.935925	6.984174
K-20	Anicut at 4+818		KO-18	79.936948	6.983795
K-21	Culvert at 4+323			79.940589	6.983494
K-22	Anicut at 4+041.5		KO-19	79.94282	6.984367
K-23	Culvert at 3+733		KO-20	79.945492	6.984807
K-24	Culvert at 3+409			79.948105	6.985527
K-25	Anicut at 3+089			79.950536	6.986479
K-26	Culvert at 2+654			79.953254	6.988865
K-27	Anicut at 2+167			79.956819	6.990564
K-28	Bridge at 2+099		KO-21	79.9572	6.991247
K-29	Anicut at 1+622.5			79.958863	6.995307
K-30	Culvert at 1+478			79.95885	6.996424
Old Negombo Canal					

No.	ID			COORDINATE	
	JICA 2003 M/P	SLLDC 2017	2018 F/S	E	N
ON-01			DC-01	79.893165	6.99596
ON-02			DC-02	79.894334	7.004124
ON-03				79.893153	7.007499
ON-04				79.890034	7.017535
ON-05				79.889519	7.019472
ON-06			DC-03	79.88946	7.019763
Mudun Ela					
ME-01		11	ME-01	79.911158	6.968727
ME-02		12	ME-02	79.913551	6.968601
ME-03		13	ME-03	79.91378	6.96865
ME-04		14	ME-04	79.915947	6.966926
ME-05		15	ME-05	9.921668	6.967333
ME-06		16	ME-06	79.924476	6.970418
ME-07	Culvert at 3+170	17	ME-07	79.931255	6.972932
ME-08	Culvert at 2+750	18	ME-08	79.93377	6.971496
ME-09		CE34-2		79.9339	6.968694
ME-09-2			ME-09	79.93707	6.963699
ME-10		CE34-1		79.938338	6.96527
ME-11	Culvert at 1+080	CE34		79.942372	6.961745
Natha Canal					
NC-01			NC-01	79.902425	6.990913
NC-02	Culvert at 0+350		NC-01	79.902837	6.990632
NC-03	Culvert at 1+105		NC-02	79.904342	6.985683
NC-04	Culvert at 1+309		NC-03	79.904931	6.98396
NC-05	Culvert at 1+597			79.905222	6.981595
Branch 1					
B01-01	Bridge at 0+413		G-01	79.907099	6.996056
B01-02	Culvert at 1+105		G-02	79.909088	6.991393
B01-03	Culvert at 2+063		G-03	79.913964	6.985686
B01-04			G-04	79.914137	6.985255
B01-05	Culvert at 2+525		G-05	79.91653	6.982465
B01-06	Culvert at 2+859		G-06	79.918885	6.980601

No.	ID			COORDINATE	
	JICA 2003 M/P	SLLDC 2017	2018 F/S	E	N
B01-07	Culvert at 3+382			79.922372	6.977941
B01-08				79.922726	6.977774
B01-09	Culvert at 3+457			79.922995	6.977626
B01-10	Culvert at 3+534			79.923452	6.977065
B01a-01			G02-01	79.909088	6.988957
B01b-01			G03-01	79.910083	6.989849
B01b-02			G03-02	79.913547	6.990105
B01b-03			G03-03	79.917229	6.992914
B01b-04				79.917445	6.99279
B01c-01			G04-01	79.91352	6.983521
B01d-01			G05-01	79.919137	6.981958
B01d-02			G05-02	79.922928	6.983086
Branch 2					
B02-01	Culvert at 1+266		A-01	79.914849	7.016928
B02-02			A-02	79.916261	7.02758
B02-03			A-03	79.917171	7.030281
B02-04				79.916882	7.030303
B02a-01			A01-01	79.91526	7.027596
B02a-02			A01-02	79.91148	7.026186
B02a-03			A01-03	79.909161	7.024109
B02a-04			A01-04	79.908267	7.022846
Branch 3					
B03-01			B-01	79.921555	7.025133
B03-02			B-02	79.9219	7.025236
B03-03			B-03	79.926251	7.025739
B03-04			B-04	79.929172	7.024995
Branch 4					
B04-01				79.916707	7.006728
B04-02				79.916787	7.006858
B04-03			C-01	79.917882	7.006754
B04-04			C-02	79.921094	7.007323
B04-05			C-03	79.922044	7.011623
B04-06			C-4	79.920184	7.013185
B04-07			C-05	79.915177	7.010034
Branch 5					
B05-01			D-01	79.926268	7.003954

No.	ID			COORDINATE	
	JICA 2003 M/P	SLLDC 2017	2018 F/S	E	N
Branch 6					
B06-01			E-01	79.926154	7.00277
B06-02			E-02	79.928778	7.002455
B06-03			E-03	79.932253	7.002164
B06-04			E-04	79.933175	7.003041
B06-05			E-05	79.935122	7.004828
B06-06			E-06	79.935729	7.006618
B06-07			E-07	79.936242	7.008337
B06-08			E-08	79.939138	7.009156
B06a-01			E01-01	79.930666	7.003743
B06b-01			E02-01	79.929826	7.000882
Branch 7					
B07-01	Culvert at 4+743		F-01	79.934581	6.98206
B07-02			F-02	79.933874	6.981126
B07-03			F-03	79.930472	6.979379
B07-04	Culvert at 3+964		F-04	79.929577	6.977703
B07-05	Culvert at 3+932		F-05	79.929469	6.97746
B07-06			F-06	79.929334	6.976658
Peliyagoda and Others					
CW1		CW1		79.899522	6.978209
CW2		CW2		79.900074	6.975619
CW4		CW4		79.901973	6.973193
CW6		CW6		79.903795	6.970815
CW7		CW7		79.906065	6.967804
CW9		CW9		79.909376	6.968175
CW10		CW10		79.90736	6.968928
CW12		CW12		79.910145	6.97092
CW14		CW14		79.898878	6.972712
CW15		CW15		79.895985	6.972837
CW17		CW17		79.894451	6.970861
CW18		CW18		79.894312	6.970739
CW18A				79.893966	6.970722
CW20		CW20		79.895117	6.970594
CW21		CW21		79.897055	6.960016
CW22		CW22		79.898093	6.969996
CW22A				79.898628	6.969964

No.	ID			COORDINATE	
	JICA 2003 M/P	SLLDC 2017	2018 F/S	E	N
CW23		CW23		79.895161	6.968599
CW27	Culvert at 1+443	CW27		79.890807	6.969426
CW29		CW29		79.891634	6.970972
CW30		CW30		79.891259	6.971417
CW35	Culvert & Gate at 1+477	CW35		79.887092	6.973766
CW37		CW37		79.885552	6.971742
CW38		CW38		79.888129	6.969968
CW42		CW42		79.8903	6.964067
CW47	Bridge at 0+050	CW47		79.892635	6.960417
CW48		CW48		79.892635	6.960417

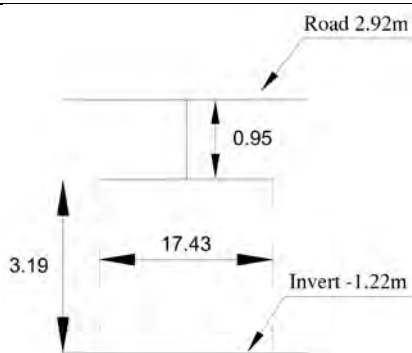
No.	ID			COORDINATE	
	JICA 2003 M/P	SLLDC 2017	2018 F/S	E	N
CW49	Culvert at 0+409	CW49		79.89157	6.962447
CW52		CW52		79.882028	6.965077
CW53		CW53		79.890947	6.968179
RCW1		RCW1		79.899693	6.978052
RCW2		RCW2		79.89873	6.972663
RCW3		RCW3		79.898241	6.970074
Culvert 17		Culvert 17		79.901313	6.954495

2.3 Drainage Facility Ledger in Kalu Oya and Mudun Ela Basin

2.3.1 Kalu Oya Basin

ID: K-01	JICA 2003 M/P	SLDC 2017	2018 F/S
			KO-01
COORDINATE	E		N
	79.882438		6.982829
PURPOSE	Bridge		
OPERATION	in use		

DRAWING



Bridge # KO-1 @ Hekitta Road
(Source: 2018 F/S Report)

SITE CONDITION



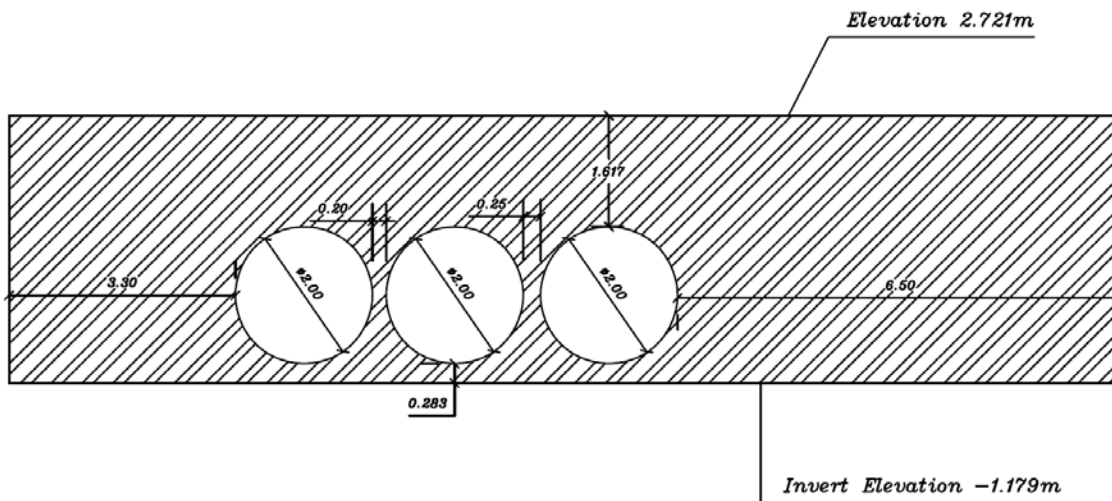
ID: K-02	JICA 2003 M/P	SLDLC 2017	2018 F/S
	Gate at 14+989		KO-22
COORDINATE	E		N
	79.885707		6.981756
PURPOSE	Gate for flood control		
OPERATION	partially broken		
DRAWING			
<i>Bund Road Elevation 2.994m</i>			
(Source: JICA 2003 M/P Report)			

SITE CONDITION



ID: K-03	JICA 2003 M/P	SLDLC 2017	2018 F/S
	Bridge at 14+944		KO-23
COORDINATE	E		N
	79.885858		6.982055
PURPOSE	Pipe Culvert		
OPERATION	in use		

DRAWING



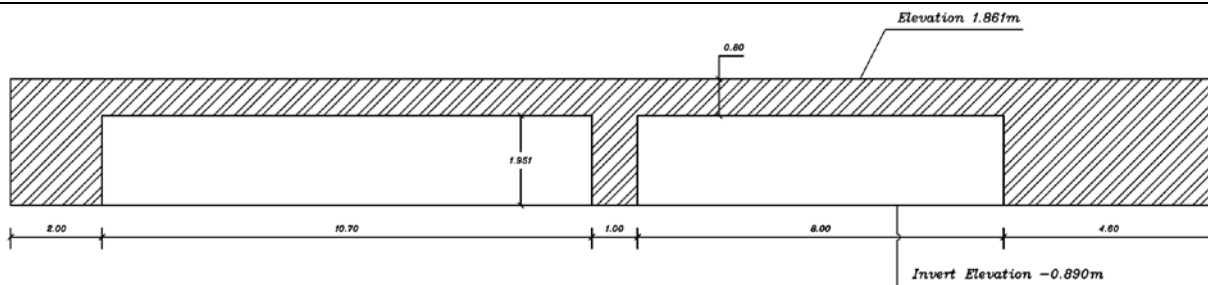
(Source: JICA 2003 M/P Report)

SITE CONDITION



ID: K-04	JICA 2003 M/P	SLDC 2017	2018 F/S
	Bridge at 14+327		KO-02
COORDINATE	E		N
	79.887829		6.987216
PURPOSE	Bridge		
OPERATION	in use		

DRAWING



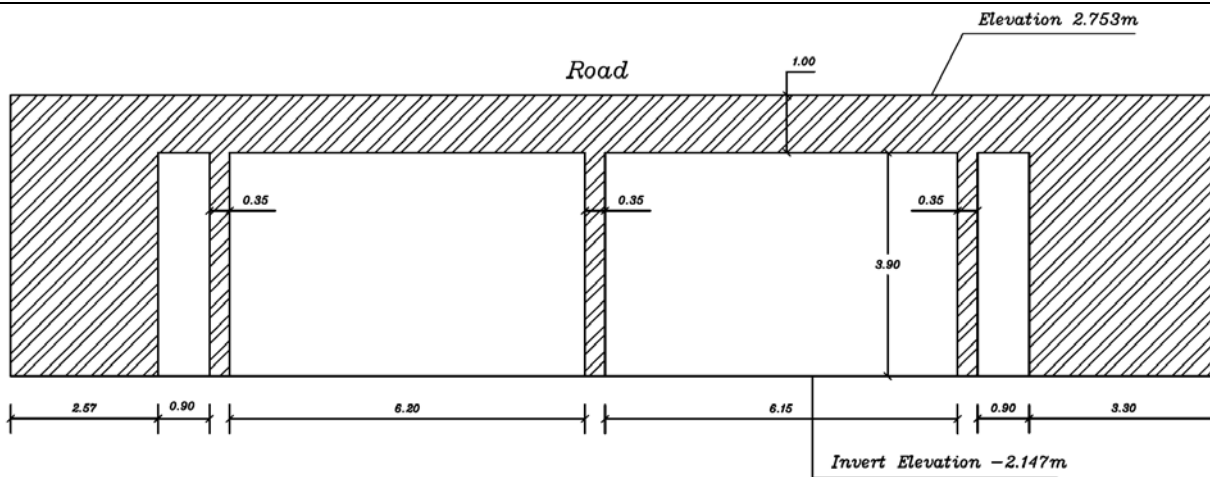
(Source: JICA 2003 M/P Report)

SITE CONDITION



ID: K-05	JICA 2003 M/P	SLDC 2017	2018 F/S
	Bridge at 13+660		KO-03
COORDINATE	E		N
	79.892161		6.991142
PURPOSE	Bridge		
OPERATION	in use		

DRAWING



(Source: JICA 2003 M/P Report)

SITE CONDITION



ID: K-06	JICA 2003 M/P	SLDC 2017	2018 F/S
	Bridge at 12+813		KO-04
COORDINATE	E		N
	79.896119		6.994877
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
(Source: JICA 2003 M/P Report)			

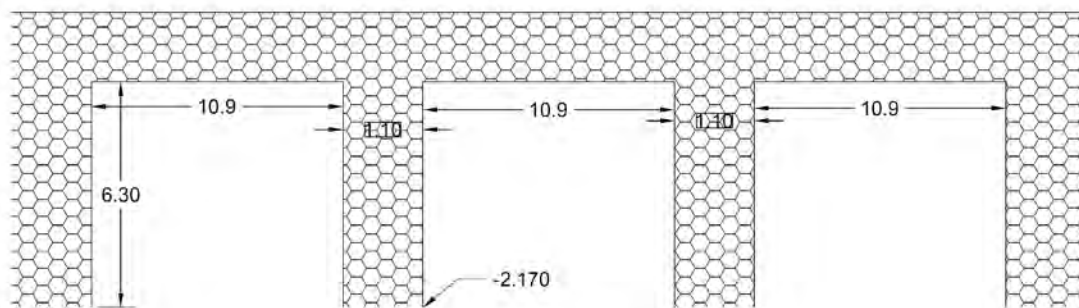
SITE CONDITION



ID: K-07	JICA 2003 M/P	SLDC 2017	2018 F/S
			KO-05
COORDINATE	E		N
	79.904484		6.997601
PURPOSE	Bridge		
OPERATION	in use		

DRAWING

Colombo - Katunayake Express way Bridge # KO-5



Invert : U/S : -1.977
D/S : -2.170

(Source: 2018 F/S Report)

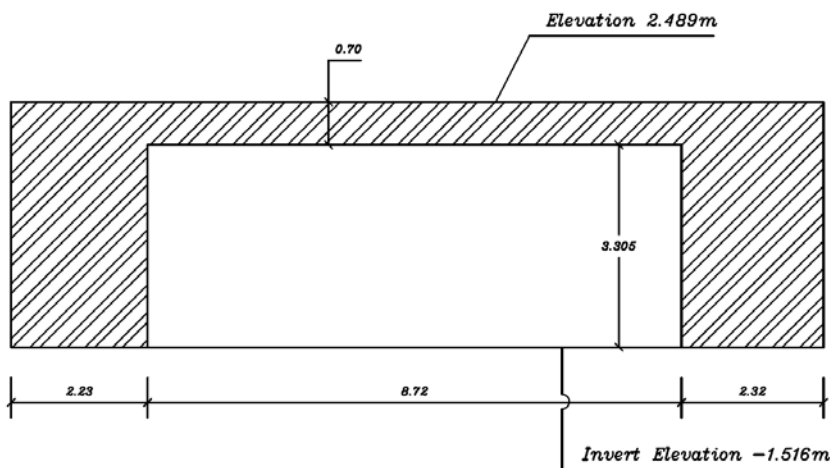
SITE CONDITION



No access

ID: K-08	JICA 2003 M/P	SLDC 2017	2018 F/S
	Bridge at 11+065		KO-06
COORDINATE	E		N
	79.904809		7.000540
PURPOSE	Bridge		
OPERATION	in use		

DRAWING



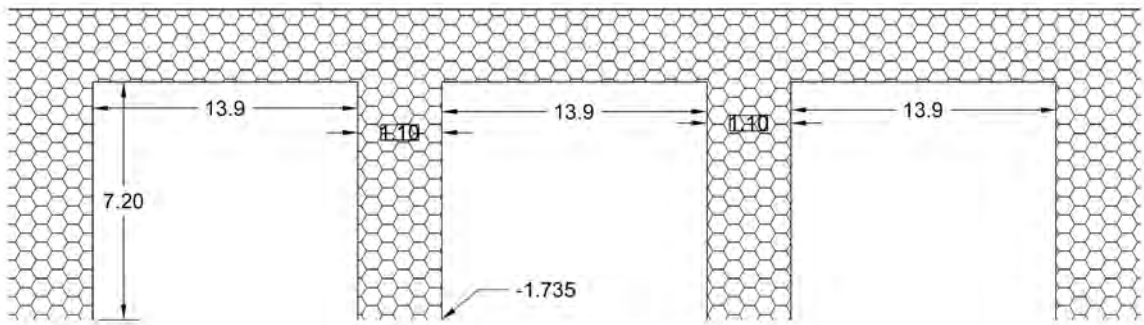

Comment for maintenance:

New bridge was constructed with 40 m in length and one pier at the center of the river. No significant raise of the girder was seen from the ground level.

(Source: JICA 2003 M/P Report)

SITE CONDITION

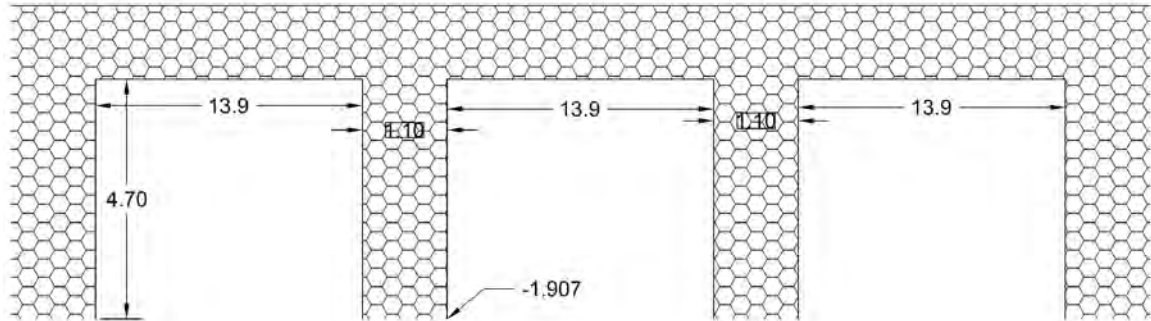


ID: K-09	JICA 2003 M/P	SLDLC 2017	2018 F/S
			KO-07
COORDINATE	E		N
	79.904101		7.001212
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
Colombo - Katunayake Express way Bridge # KO-7			
			
Invert : U/S : -1.651 D/S : -1.735 (Source: 2018 F/S Report)			
SITE CONDITION			
		<p>No access</p>	

ID: K-10	JICA 2003 M/P	SLDC 2017	2018 F/S
			KO-08
COORDINATE	E		N
	79.902050		7.004420
PURPOSE	Bridge		
OPERATION	in use		

DRAWING

Colombo - Katunayake Express way Bridge # KO-8



Invert : U/S : -1.907
D/S : -1.503

(Source: 2018 F/S Report)

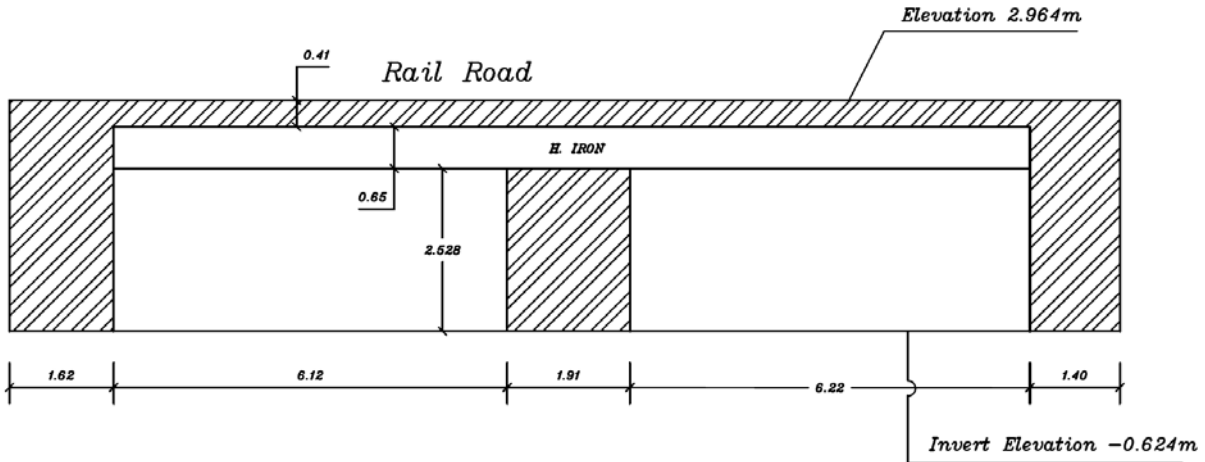
SITE CONDITION



No access

ID: K-11	JICA 2003 M/P	SLDLC 2017	2018 F/S
	Bridge at 9+220		KO-09
COORDINATE	E		N
	79.911878		7.006621
PURPOSE	Railroad Bridge		
OPERATION	in use		

DRAWING



(Source: JICA 2003 M/P Report)

SITE CONDITION



ID: K-12	JICA 2003 M/P	SLDC 2017	2018 F/S
	Anicut at 8+146		KO-10
COORDINATE	E		N
	79.920770		7.005122
PURPOSE	Anicut		
OPERATION	broken		
DRAWING			
(Source: JICA 2003 M/P Report)			

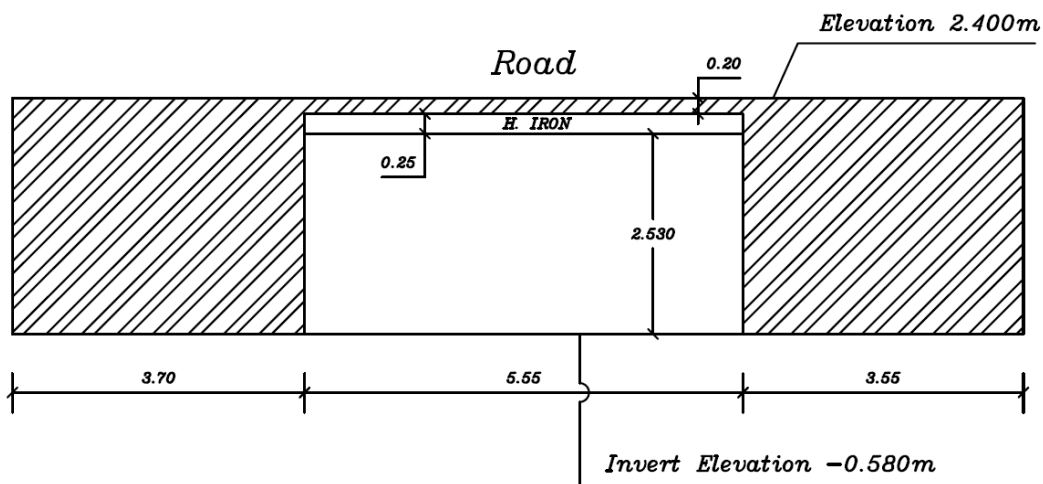
SITE CONDITION





ID: K-13	JICA 2003 M/P	SLDLC 2017	2018 F/S
	Bridge at 8+031		KO-11
COORDINATE	E		N
	79.921464		7.005091
PURPOSE	Bridge		
OPERATION	in use		

DRAWING

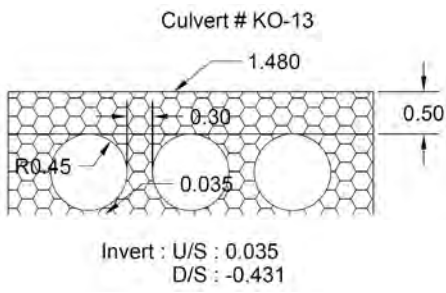






(Source: JICA 2003 M/P Report)

SITE CONDITION



ID: K-14	JICA 2003 M/P	SLDC 2017	2018 F/S
COORDINATE	E		N
	79.923349		7.003656
PURPOSE	Pipe Culvert		
OPERATION	in use		
DRAWING			
<p>Culvert # KO-12</p> <p>Invert : U/S : 0.191 D/S : -0.263</p> <p>(Source: 2018 F/S Report)</p>			
SITE CONDITION			

ID: K-15	JICA 2003 M/P	SLDC 2017	2018 F/S
			KO-13
COORDINATE	E		N
	79.923473		7.002826
PURPOSE	Pipe Culvert		
OPERATION	broken		
DRAWING			
<p>Culvert # KO-13</p>  <p>Invert : U/S : 0.035 D/S : -0.431</p> <p>(Source: 2018 F/S Report)</p>			
SITE CONDITION			
			
			

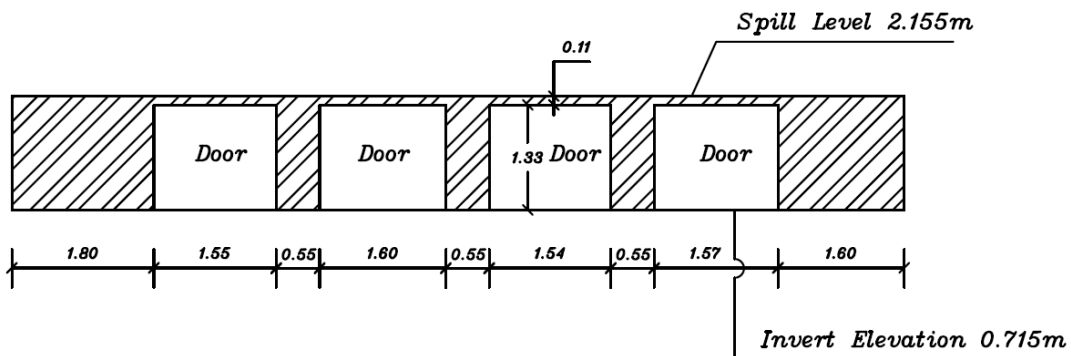
ID: K-16	JICA 2003 M/P	SLDC 2017	2018 F/S
	Bridge at 6+940.8		KO-14
COORDINATE	E		N
	79.924317		6.997340
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
(Source: JICA 2003 M/P Report)			

SITE CONDITION



ID: K-17	JICA 2003 M/P	SLDC 2017	2018 F/S
	Anicut at 5+498		
COORDINATE	E		N
	79.932787		6.987160
PURPOSE	Pipe Culvert connecting a river and a marsh area		
OPERATION	removed		

DRAWING



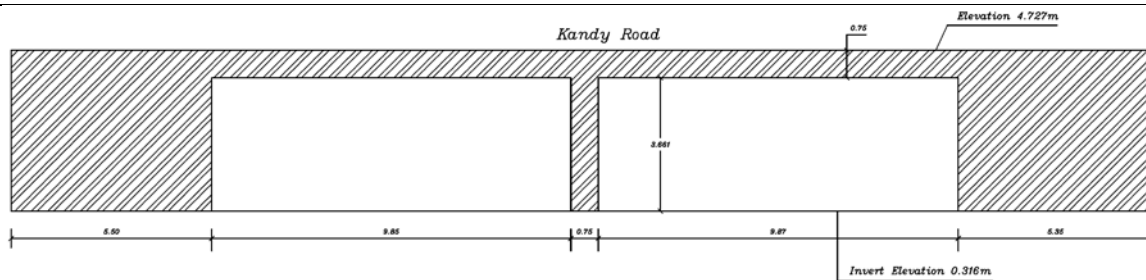
(Source: JICA 2003 M/P Report)

SITE CONDITION



ID: K-18	JICA 2003 M/P	SLDLC 2017	2018 F/S
	Bridge at 5+179		KO-15
COORDINATE	E		N
	79.934401		6.985579
PURPOSE	Bridge		
OPERATION	in use		

DRAWING



(Source: JICA 2003 M/P Report)

SITE CONDITION



ID: K-19	JICA 2003 M/P	SLDLC 2017	2018 F/S
	Anicut at 4+913		KO-17
COORDINATE	E		N
	79.935925		6.984174
PURPOSE	Anicut		
OPERATION	in use		
DRAWING			
<p style="text-align: center;">Spill Level 2.555m</p> <p style="text-align: center;">0.10</p> <p style="text-align: center;">1.40 Door</p> <p style="text-align: center;">Door</p> <p style="text-align: center;">1.90 1.75 0.60 1.75 1.83</p> <p style="text-align: center;">Invert Elevation 1.055m</p>			
(Source: JICA 2003 M/P Report)			

SITE CONDITION



ID: K-20	JICA 2003 M/P	SLLDLC 2017	2018 F/S
	Anicut at 4+818		KO-18
COORDINATE	E		N
	79.936948		6.983795
PURPOSE	Anicut		
OPERATION	partially broken		
DRAWING			
<p style="text-align: center;">(Source: JICA 2003 M/P Report)</p>			

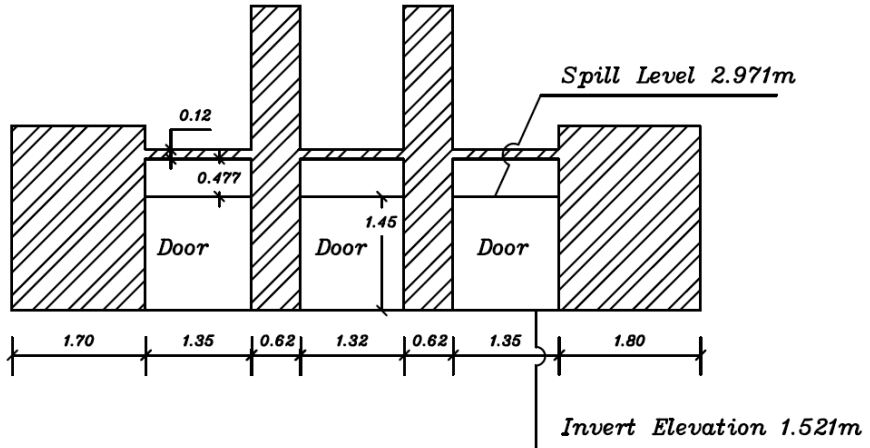
SITE CONDITION



ID: K-21	JICA 2003 M/P	SLDC 2017	2018 F/S
	Culvert at 4+323		
COORDINATE	E		N
	79.940589		6.983494
PURPOSE	Culvert		
OPERATION	removed		
DRAWING			
<p style="text-align: center;">(Source: JICA 2003 M/P Report)</p>			
SITE CONDITION			

ID: K-22	JICA 2003 M/P	SLDLC 2017	2018 F/S
	Anicut at 4+041.5		KO-19
COORDINATE	E		N
	79.942820		6.984367
PURPOSE	Anicut		
OPERATION	in use		

DRAWING



(Source: JICA 2003 M/P Report)

SITE CONDITION





ID: K-23	JICA 2003 M/P	SLDLC 2017	2018 F/S
	Culvert at 3+733		KO-20
COORDINATE	E		N
	79.945492		6.984807
PURPOSE	Culvert		
OPERATION	in use		
DRAWING			
(Source: JICA 2003 M/P Report)			

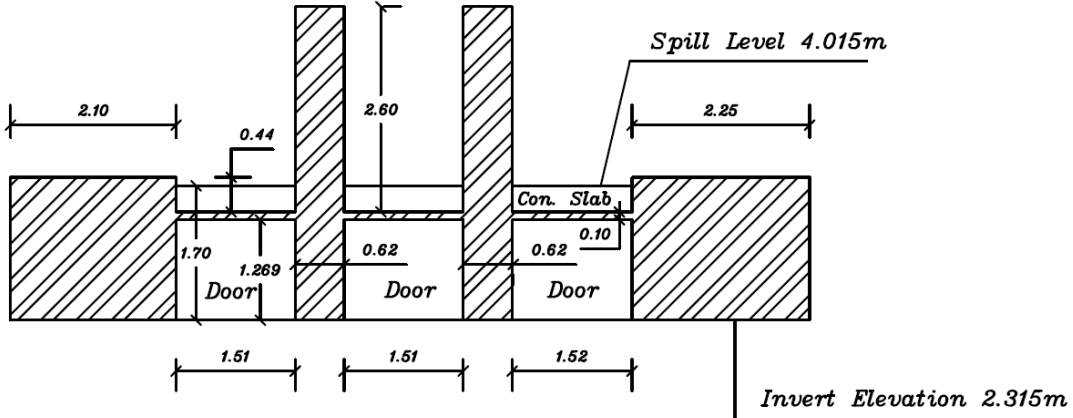
SITE CONDITION



ID: K-24	JICA 2003 M/P	SLDLC 2017	2018 F/S
	Culvert at 3+409		
COORDINATE	E		N
	79.948105		6.985527
PURPOSE			
OPERATION	Not confirmed		
DRAWING			
<p style="text-align: center;">(Source: JICA 2003 M/P Report)</p>			
SITE CONDITION			
No access			

ID: K-25	JICA 2003 M/P	SLLCD 2017	2018 F/S
	Anicut at 3+089		
COORDINATE	E		N
	79.950536		6.986479
PURPOSE	Anicut		
OPERATION	in use		

DRAWING



(Source: JICA 2003 M/P Report)

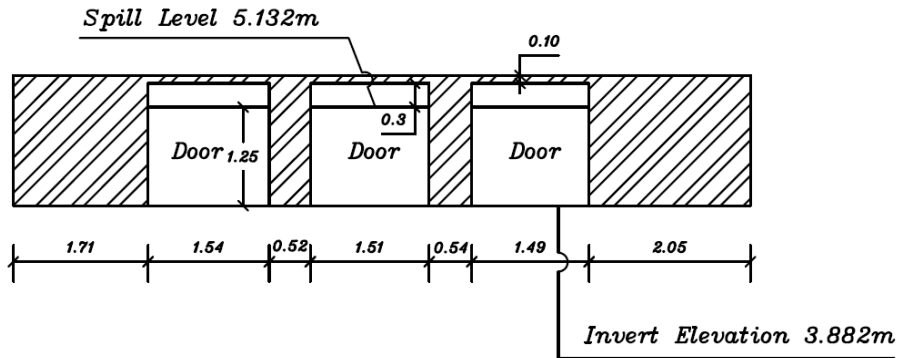
SITE CONDITION



ID: K-26	JICA 2003 M/P	SLDC 2017	2018 F/S
	Culvert at 2+654		
COORDINATE	E		N
	79.953254		6.988865
PURPOSE	Culvert		
OPERATION	Not confirmed		
DRAWING			
<p style="text-align: center;">(Source: JICA 2003 M/P Report)</p>			
SITE CONDITION			
No access			

ID: K-27	JICA 2003 M/P	SLDLC 2017	2018 F/S
	Anicut at 2+167		
COORDINATE	E		N
	79.956819		6.990564
PURPOSE	-		
OPERATION	removed		

DRAWING



(Source: JICA 2003 M/P Report)

SITE CONDITION



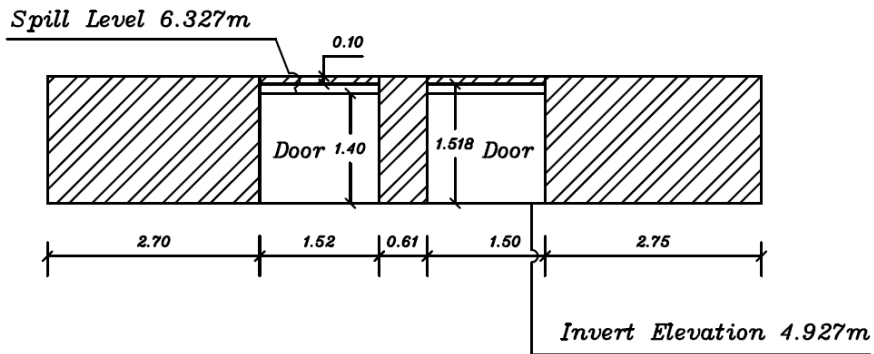
ID: K-28	JICA 2003 M/P	SLDC 2017	2018 F/S
	Bridge at 2+099		KO-21
COORDINATE	E		N
	79.957200		6.991247
PURPOSE	Bridge and Pipe Culvert (dia. = 1.0m x 2 nos.)		
OPERATION	in use (Pipe Culverts were newly installed)		
DRAWING			
(Source: JICA 2003 M/P Report)			

SITE CONDITION



ID: K-29	JICA 2003 M/P	SLDLC 2017	2018 F/S
	Anicut at 1+622.5		
COORDINATE	E		N
	79.958863		6.995307
PURPOSE	Anicut		
OPERATION	in use		

DRAWING



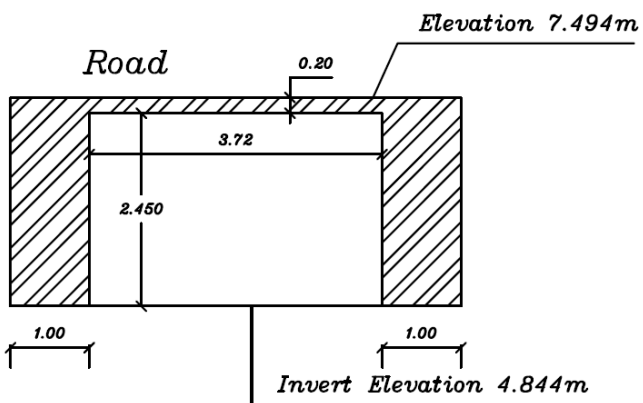
(Source: JICA 2003 M/P Report)

SITE CONDITION



ID: K-30	JICA 2003 M/P	SLDC 2017	2018 F/S
	Culvert at 1+478		
COORDINATE	E		N
	79.958850		6.996424
PURPOSE	Bridge		
OPERATION	in use		

DRAWING



Comment for maintenance:

Original bridge has been collapsed and new bridge was built over the old one with the similar flow area.

(Source: JICA 2003 M/P Report)

SITE CONDITION

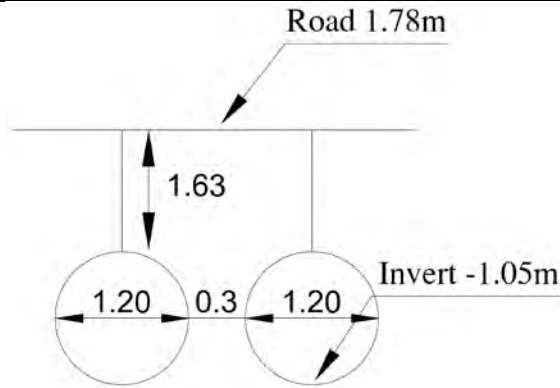




2.3.2 Old Negombo Canal

ID: ON-01	JICA 2003 M/P	SLLDLC 2017	2018 F/S
			DC-01
COORDINATE	E		N
	79.893165		6.995960
PURPOSE	Pipe Culvert		
OPERATION	in use		

DRAWING



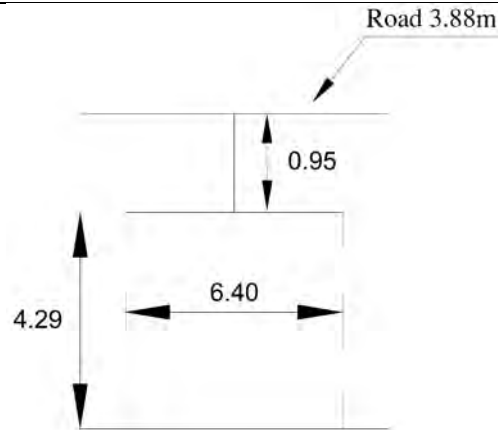
Bridge # DC-1 @ Muthuraja Mawatha
(Source: 2018 F/S Report)

SITE CONDITION



ID: ON-02	JICA 2003 M/P	SLDC 2017	2018 F/S
			DC-02
COORDINATE	E		N
	79.894334		7.004124
PURPOSE	Bridge		
OPERATION	in use		

DRAWING









Bridge # DC-2 @ Bangalawatta Road
(Source: 2018 F/S Report)

SITE CONDITION



ID: ON-03	JICA 2003 M/P	SLDC 2017	2018 F/S
COORDINATE	E		N
	79.893153		7.007499
PURPOSE	Bridge (Pedestrian)		
OPERATION	in use		
DRAWING			
(No drawing is available.)			
SITE CONDITION			
			
			

ID: ON-04	JICA 2003 M/P	SLDC 2017	2018 F/S
COORDINATE	E		N
	79.890034		7.017535
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
(No drawing is available.)			
SITE CONDITION			
			
No access			

ID: ON-05	JICA 2003 M/P	SLDC 2017	2018 F/S
COORDINATE	E		N
	79.889519		7.019472
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
(No drawing is available.)			
SITE CONDITION			
			
			

ID: ON-6	JICA 2003 M/P	SLDC 2017	2018 F/S
			DC-03
COORDINATE	E		N
	79.889460		7.019763
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
(No drawing is available.)			

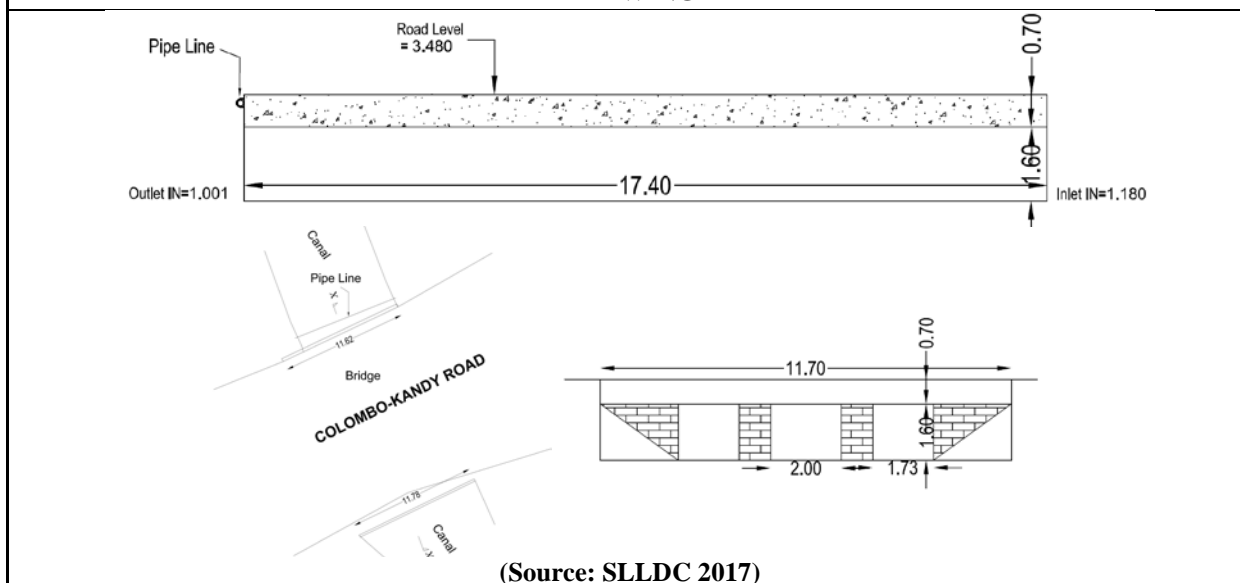
SITE CONDITION



2.3.3 Mudun Ela

ID: ME-01	JICA 2003 M/P	SLDC 2017	2018 F/S
		11	ME-01
COORDINATE	E		N
	79.911158		6.968727
PURPOSE	Bridge		
OPERATION	in use		

DRAWING

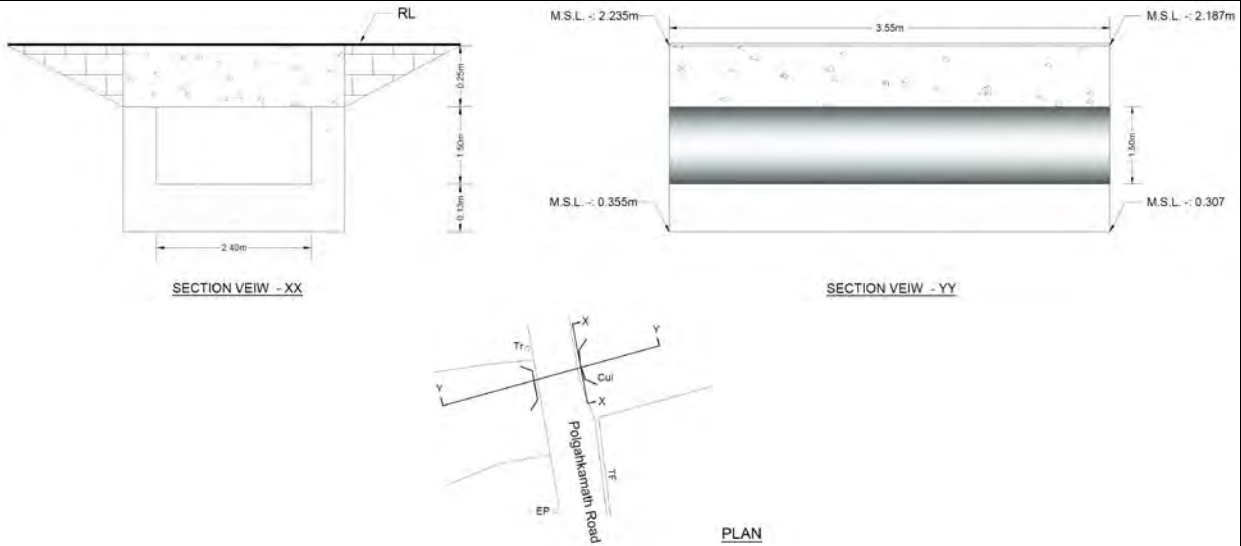


SITE CONDITION



ID: ME-02	JICA 2003 M/P	SLDC 2017	2018 F/S
		12	ME-02
COORDINATE	E		N
	79.913551		6.968601
PURPOSE	Culvert		
OPERATION	in use		

DRAWING



(Source: 2018 F/S Report)

SITE CONDITION



ID: ME-03	JICA 2003 M/P	SLDC 2017	2018 F/S
		13	ME-03
COORDINATE	E		N
	79.913780		6.968650
PURPOSE	Pipe Culvert		
OPERATION	in use		
DRAWING			
PLAN (Source: 2018 F/S Report)			

SITE CONDITION





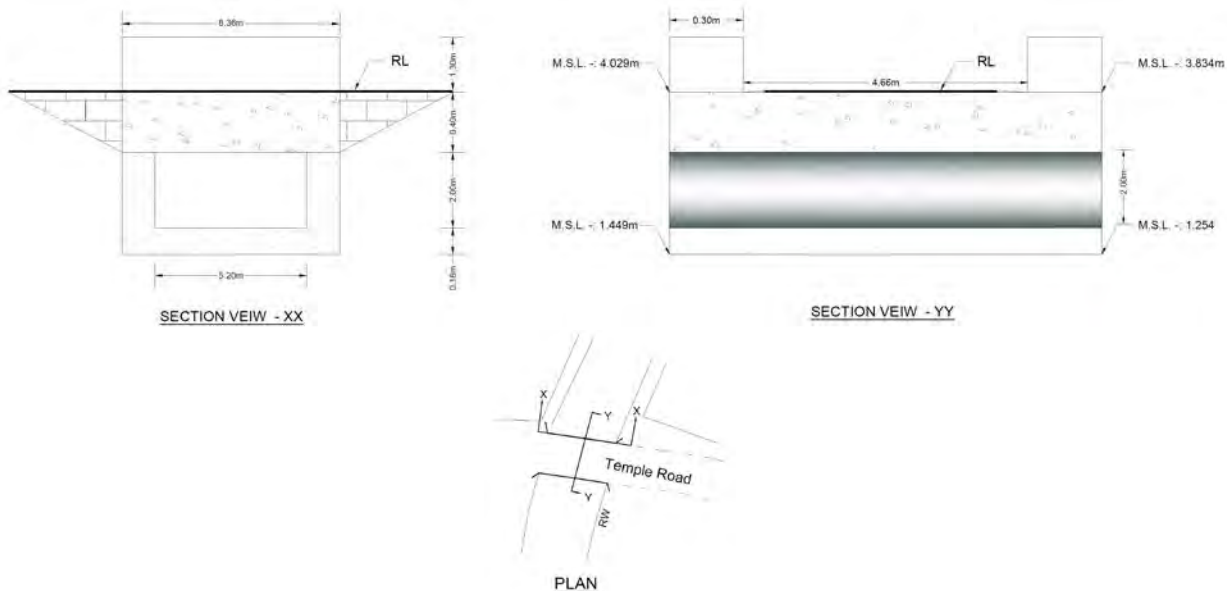
ID: ME-04	JICA 2003 M/P	SLDC 2017	2018 F/S
		14	ME-04
COORDINATE	E		N
	79.915947		6.966926
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
(Source: 2018 F/S Report)			

SITE CONDITION



ID: ME-05	JICA 2003 M/P	SLDC 2017	2018 F/S
		15	ME-05
COORDINATE	E		N
	9.921668		6.967333
PURPOSE	Bridge		
OPERATION	in use		

DRAWING



(Source: 2018 F/S Report)

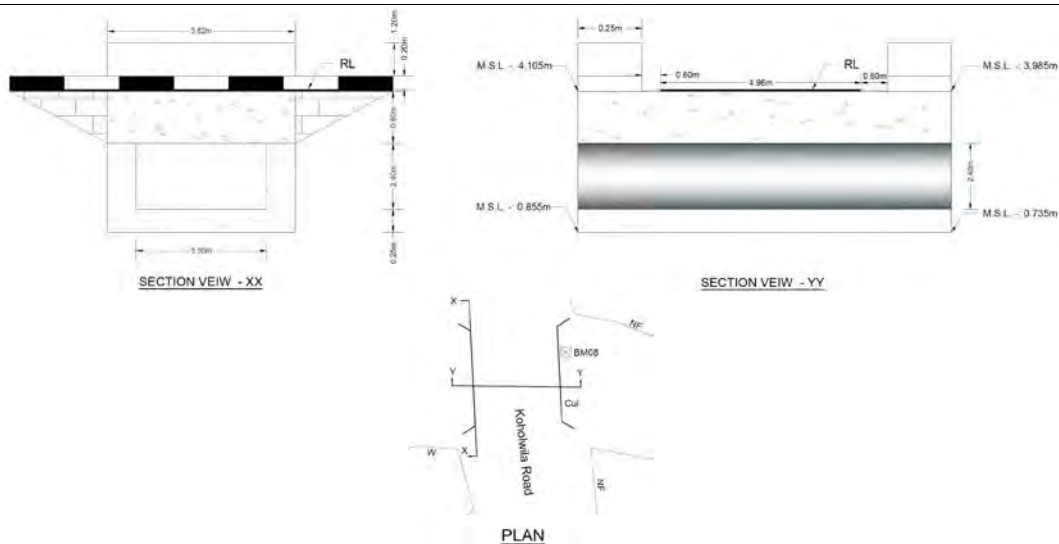
SITE CONDITION





ID: ME-06	JICA 2003 M/P	SLDC 2017	2018 F/S
		16	ME-06
COORDINATE	E		N
	79.924476		6.970418
PURPOSE	Bridge		
OPERATION	in use		

DRAWING



(Source: 2018 F/S Report)

SITE CONDITION



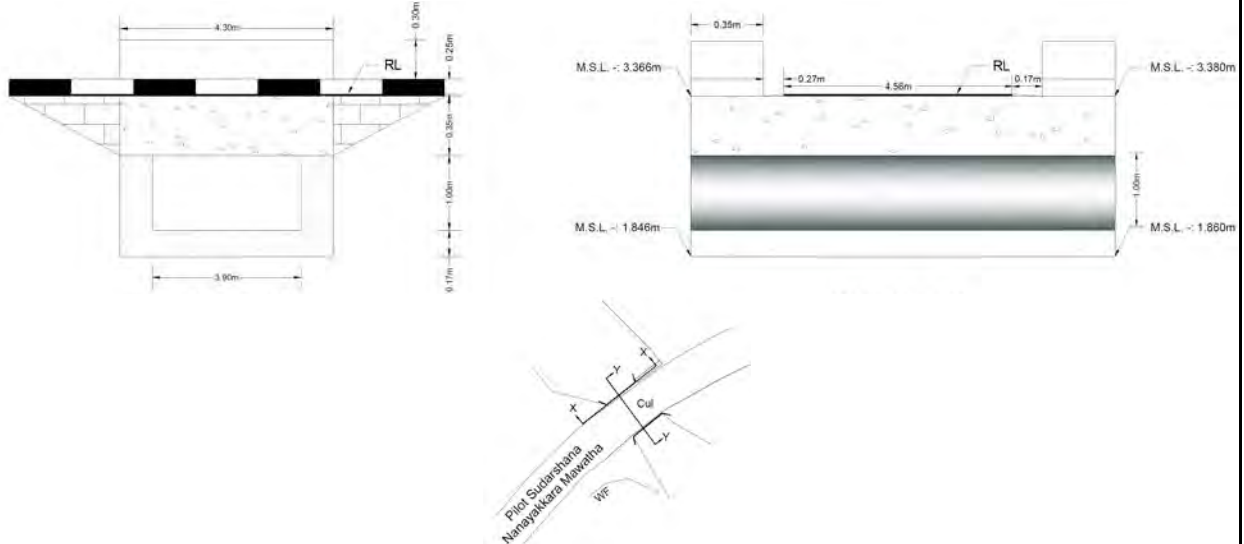
ID: ME-07	JICA 2003 M/P	SLDC 2017	2018 F/S
	Culvert at 3+170	17	ME-07
COORDINATE	E		N
	79.931255		6.972932
PURPOSE	Bridge and Pipe Culvert		
OPERATION	in use		
DRAWING			
<p style="text-align: center;">(Source: JICA 2003 M/P Report)</p>			
<p style="text-align: center;">(Source: 2018 F/S Report)</p>			

SITE CONDITION



ID: ME-08	JICA 2003 M/P	SLDC 2017	2018 F/S
	Culvert at 2+750	18	ME-08
COORDINATE	E		N
	79.933770		6.971496
PURPOSE	Bridge		
OPERATION	in use		

DRAWING



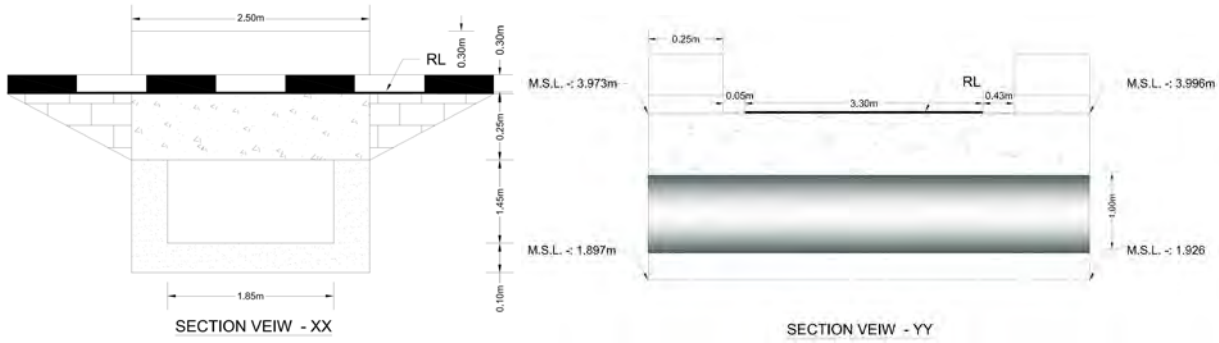
(Source: 2018 F/S Report)

SITE CONDITION



ID: ME-09	JICA 2003 M/P	SLLCD 2017	2018 F/S
		CE34-2	
COORDINATE	E		N
	79.933900		6.968694
PURPOSE	Bridge		
OPERATION	in use		

DRAWING



(Source: SLLDC 2017 Survey)

SITE CONDITION





ID: ME-09-2	JICA 2003 M/P	SLDLC 2017	2018 F/S
			ME-09
COORDINATE	E		N
	79.937070		6.963699
PURPOSE	Bridge		
OPERATION	in use		

DRAWING

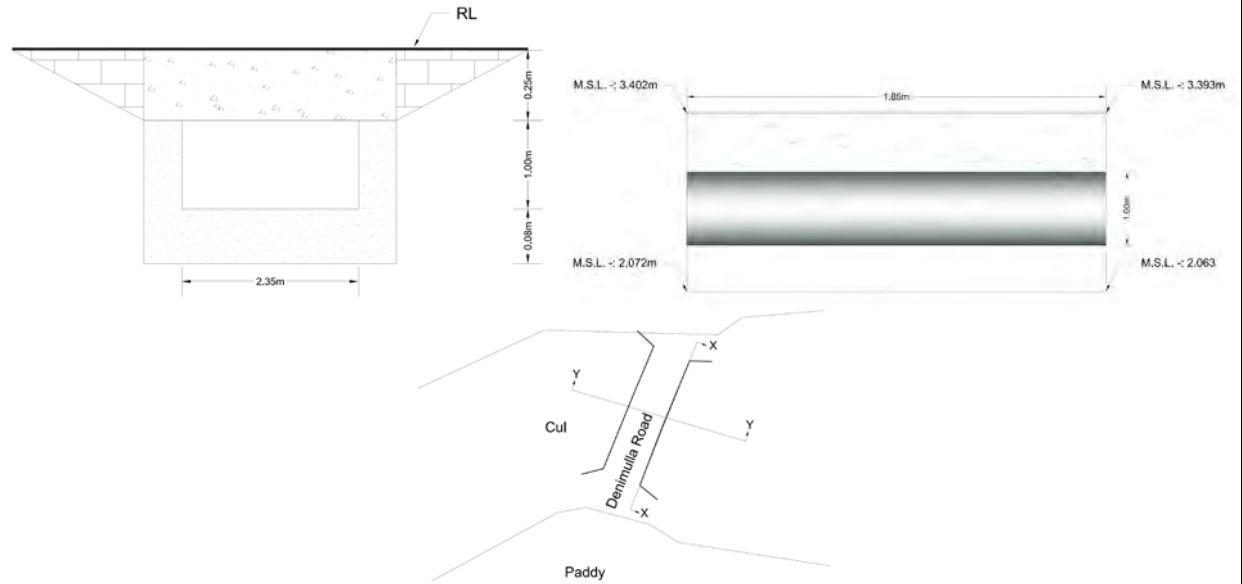
(No drawing was shown in 2018 F/S Report.)

SITE CONDITION



ID: ME-10	JICA 2003 M/P	SLLCD 2017	2018 F/S
		CE34-1	
COORDINATE	E		N
	79.938338		6.965270
PURPOSE	Bridge		
OPERATION	in use		

DRAWING



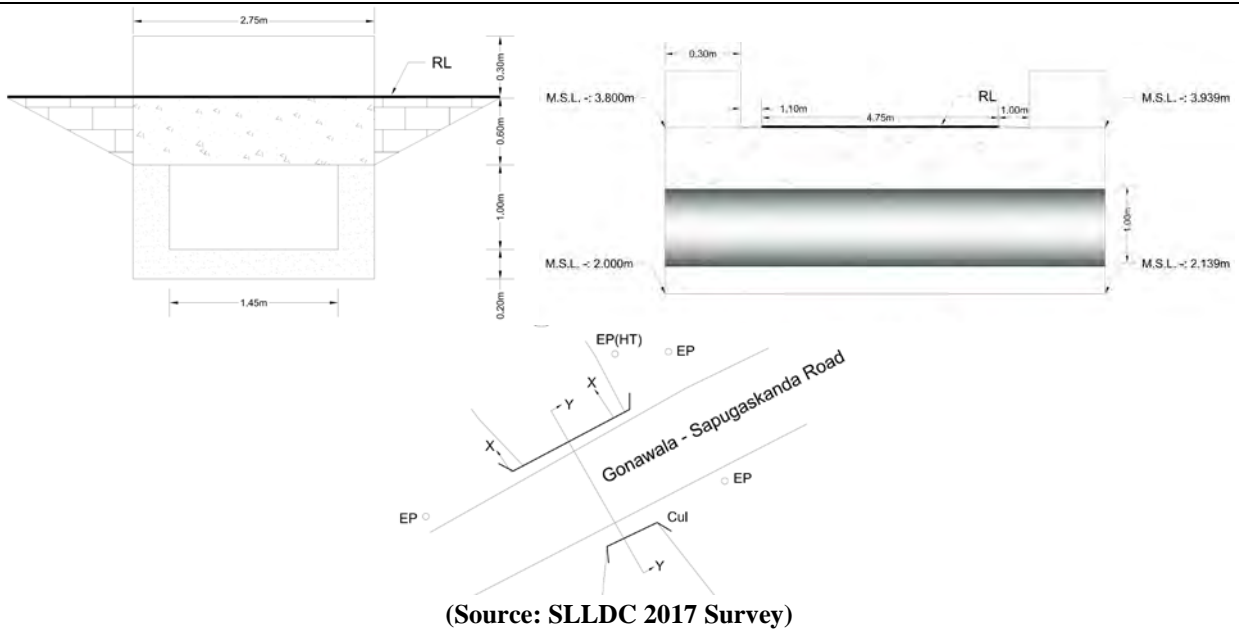
(Source: SLLDC 2017 Survey)

SITE CONDITION



ID: ME-11	JICA 2003 M/P	SLDC 2017	2018 F/S
	Culvert at 1+080	CE34	
COORDINATE	E		N
	79.942372		6.961745
PURPOSE	Culvert		
OPERATION	in use		

DRAWING




SITE CONDITION





2.3.4 Natha Canal

ID: NC-01	JICA 2003 M/P	SLLDC 2017	2018 F/S
			NC-01
COORDINATE	E		N
	79.902425		6.990913
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
(No drawing is available)			
SITE CONDITION			
		<p>No access</p>	

ID: NC-02	JICA 2003 M/P	SLDC 2017	2018 F/S
	Culvert at 0+350		NC-01
COORDINATE	E		N
	79.902837		6.990632
PURPOSE	Railroad Bridge		
OPERATION	in use		
DRAWING			
(Source: 2018 F/S Report)			

SITE CONDITION



ID: NC-03	JICA 2003 M/P	SLDLC 2017	2018 F/S
	Culvert at 1+105		NC-02
COORDINATE	E		N
	79.904342		6.985683
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
(Source: 2018 F/S Report)			

SITE CONDITION



ID: NC-04	JICA 2003 M/P	SLDLC 2017	2018 F/S
	Culvert at 1+309		NC-03
COORDINATE	E		N
	79.904931		6.983960
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
<p style="text-align: center;">Downstream</p> <p style="text-align: center;">Upstream</p> <p style="text-align: center;">(Source: 2018 F/S Report)</p>			

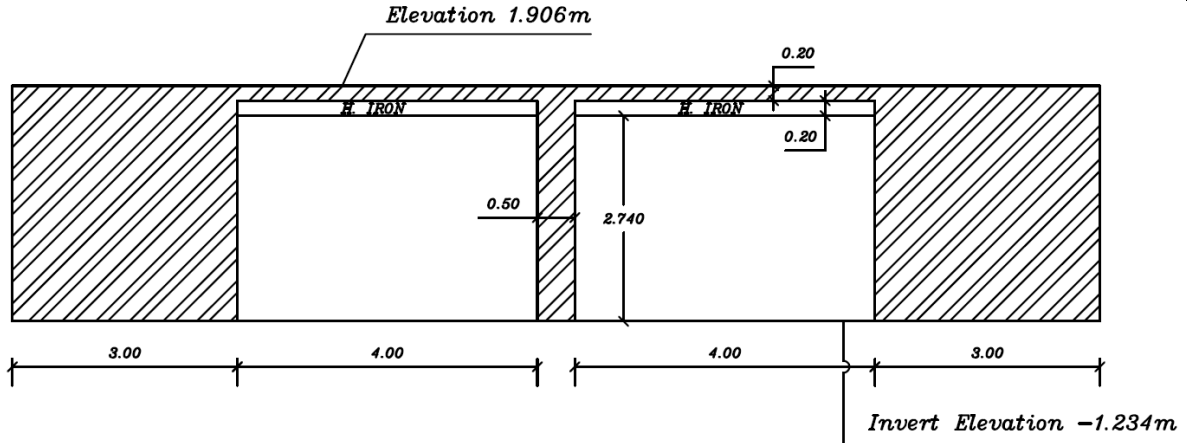
SITE CONDITION





ID: NC-05	JICA 2003 M/P	SLDC 2017	2018 F/S
	Culvert at 1+597		
COORDINATE	E		N
	79.905222		6.981595
PURPOSE	Bridge		
OPERATION	in use		

DRAWING



(Source: JICA 2003 M/P Report)

SITE CONDITION

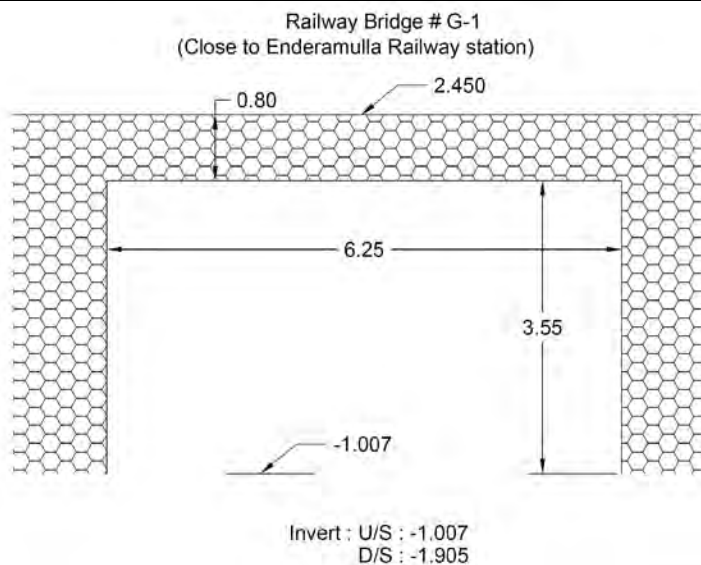




2.3.5 Branch 1

ID: B01-01	JICA 2003 M/P	SLDC 2017	2018 F/S
	Bridge at 0+413		G-01
COORDINATE	E		N
	79.907099		6.996056
PURPOSE	Railroad Bridge		
OPERATION	in use		

DRAWING



(Source: 2018 F/S Report)

SITE CONDITION





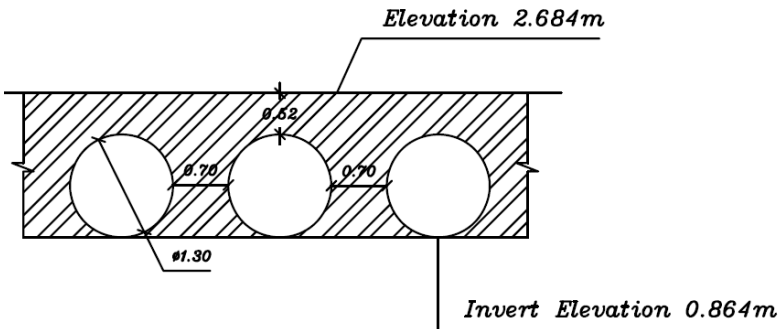
ID: B01-02	JICA 2003 M/P	SLDC 2017	2018 F/S
	Culvert at 1+105		G-02
COORDINATE	E		N
	79.909088		6.991393
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
<p style="text-align: center;">(Source: JICA 2003 M/P Report)</p>			

SITE CONDITION



ID: B01-03	JICA 2003 M/P	SLDC 2017	2018 F/S
	Culvert at 2+063		G-03
COORDINATE	E		N
	79.913964		6.985686
PURPOSE	Bridge		
OPERATION	in use		

DRAWING



Comment for maintenance:

New bridge was constructed with approx. 16 m in length and one pier at the center of the river.
No significant raise of the girder was seen from the ground level.

(Source: JICA 2003 M/P Report)

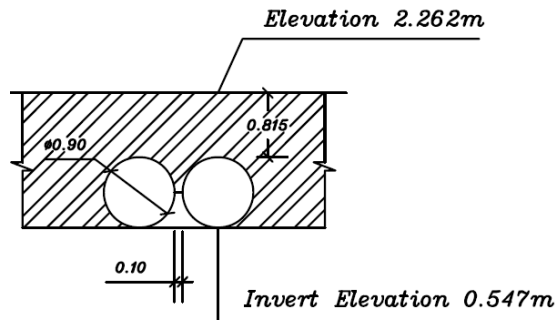
SITE CONDITION



ID: B01-04	JICA 2003 M/P	SLDC 2017	2018 F/S
			G-04
COORDINATE	E		N
	79.914137		6.985255
PURPOSE	Pipe Culvert (dia. = approx. 1.0 m x 8 nos.)		
OPERATION	in use		
DRAWING			
(No drawing is available.)			
SITE CONDITION			

ID: B01-05	JICA 2003 M/P	SLDC 2017	2018 F/S
	Culvert at 2+525		G-05
COORDINATE	E		N
	79.916530		6.982465
PURPOSE	Pipe Culvert		
OPERATION	in use		

DRAWING



(Source: JICA 2003 M/P Report)

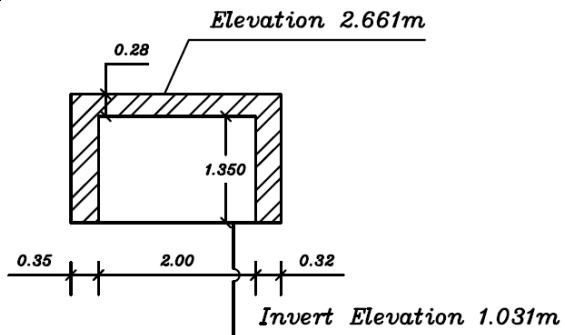
SITE CONDITION



ID: B01-06	JICA 2003 M/P	SLDC 2017	2018 F/S
	Culvert at 2+859		G-06
COORDINATE	E		N
	79.918885		6.980601
PURPOSE	Culvert		
OPERATION	in use		
DRAWING			
<p style="text-align: center;">(Source: JICA 2003 M/P Report)</p>			
SITE CONDITION			

ID: B01-07	JICA 2003 M/P	SLDC 2017	2018 F/S
	Culvert at 3+382		
COORDINATE	E		N
	79.922372		6.977941
PURPOSE	Bridge		
OPERATION	in use		

DRAWING



(Source: JICA 2003 M/P Report)

SITE CONDITION



ID: B01-08	JICA 2003 M/P	SLDC 2017	2018 F/S
COORDINATE	E		N
	79.922726		6.977774
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
(No drawing is available.)			

SITE CONDITION



ID: B01-09	JICA 2003 M/P	SLDLC 2017	2018 F/S
	Culvert at 3+457		
COORDINATE	E		N
	79.922995		6.977626
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
<p style="text-align: center;">Elevation 2.785m</p> <p style="text-align: center;">Invert Elevation 1.175m</p>		<p>Comment for maintenance: A new bridge was constructed with approx. 5 m in length and 1.5 m in height (under the bridge).</p>	
(Source: JICA 2003 M/P Report)			

SITE CONDITION



ID: B01-10	JICA 2003 M/P	SLDC 2017	2018 F/S
	Culvert at 3+534		
COORDINATE	E		N
	79.923452		6.977065
PURPOSE	Pipe Culvert		
OPERATION	in use		
DRAWING			
<p style="text-align: center;">(Source: JICA 2003 M/P Report)</p>			





SITE CONDITION





ID: B01a-01	JICA 2003 M/P	SLDC 2017	2018 F/S
			G02-01
COORDINATE	E		N
	79.909088		6.988957
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
(No drawing is available.)			
SITE CONDITION			
			
			

ID: B01b-01	JICA 2003 M/P	SLLCD 2017	2018 F/S
			G03-01
COORDINATE	E		N
	79.910083		6.989849
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
(No drawing is available.)			
SITE CONDITION			

ID: B01b-02	JICA 2003 M/P	SLDC 2017	2018 F/S
			G03-02
COORDINATE	E		N
	79.913547		6.990105
PURPOSE	Culvert		
OPERATION	in use		
DRAWING			
(No drawing is available.)			
SITE CONDITION			
			
			

ID: B01b-03	JICA 2003 M/P	SLDC 2017	2018 F/S
			G03-03
COORDINATE	E		N
	79.917229		6.992914
PURPOSE	Culvert		
OPERATION	in use		
DRAWING			
(No drawing is available.)			
SITE CONDITION			

ID: B01b-04	JICA 2003 M/P	SLDC 2017	2018 F/S
COORDINATE	E		N
	79.917445		6.992790
PURPOSE	Culvert		
OPERATION	in use		
DRAWING			
(No drawing is available.)			
SITE CONDITION			
			

ID: B01c-01	JICA 2003 M/P	SLDLC 2017	2018 F/S
			G04-01
COORDINATE	E		N
	79.913520		6.983521
PURPOSE	Pipe Culvert (dia. = approx. 1.0m x 4 nos.)		
OPERATION	in use		
DRAWING			
(No drawing is available.)			

SITE CONDITION



ID: B01d-01	JICA 2003 M/P	SLDC 2017	2018 F/S
			G05-01
COORDINATE	E		N
	79.919137		6.981958
PURPOSE	Bridge		
OPERATION	broken		
DRAWING			
(No drawing is available.)			
SITE CONDITION			
			
			

ID: B01d-02	JICA 2003 M/P	SLLDLC 2017	2018 F/S
			G05-02
COORDINATE	E		N
	79.922928		6.983086
PURPOSE	Culvert		
OPERATION	in use		
DRAWING			
(No drawing is available.)			

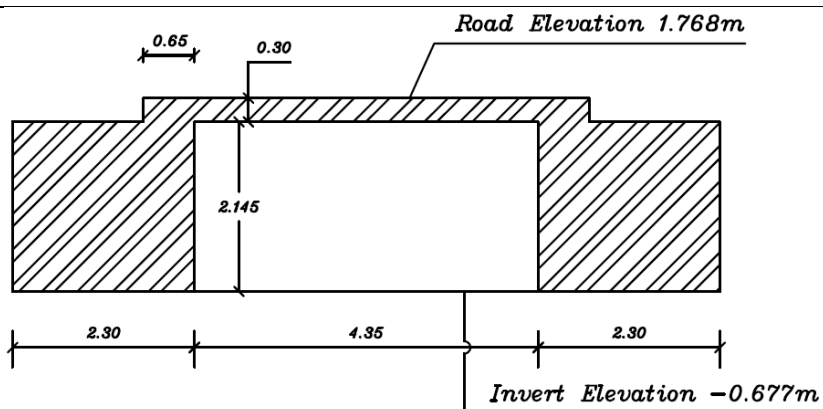
SITE CONDITION



2.3.6 Branch 2

ID: B02-01	JICA 2003 M/P	SLLD 2017	2018 F/S
	Culvert at 1+266		A-01
COORDINATE	E		N
	79.914849		7.016928
PURPOSE	Bridge		
OPERATION	in use		

DRAWING



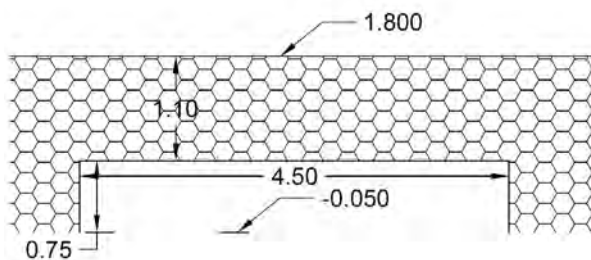
SITE CONDITION



ID: B02-02	JICA 2003 M/P	SLDC 2017	2018 F/S
			A-02
COORDINATE	E		N
	79.916261		7.027580
PURPOSE	Bridge		
OPERATION	in use		

DRAWING

Culvert # A-2 @ Mahabage - Ragama Road



Invert : U/S : 0.150
D/S : -0.050

(Source: 2018 F/S Report)

SITE CONDITION



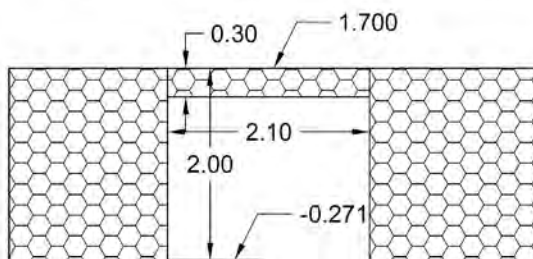
ID: B02-03	JICA 2003 M/P	SLDC 2017	2018 F/S
			A-03
COORDINATE	E		N
	79.917171		7.030281
PURPOSE	Pipe Culvert		
OPERATION	in use		
DRAWING			
(No drawing is available.)			
SITE CONDITION			
			
			

ID: B02-04	JICA 2003 M/P	SLDC 2017	2018 F/S
COORDINATE	E		N
	79.916882		7.030303
PURPOSE	Culvert		
OPERATION	in use		
DRAWING			
(No drawing is available.)			
SITE CONDITION			

ID: B02a-01	JICA 2003 M/P	SLDC 2017	2018 F/S
			A01-01
COORDINATE	E		N
	79.915260		7.027596
PURPOSE	Bridge		
OPERATION	in use		

DRAWING

Culvert # A1-1 @ Nawa Halandurawa Road

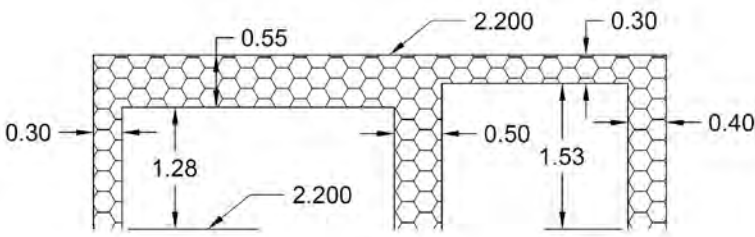


Invert : U/S : -0.271
D/S : -0.165

(Source: 2018 F/S Report)

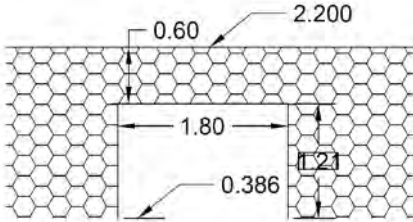



SITE CONDITION



ID: B02a-02	JICA 2003 M/P	SLDLC 2017	2018 F/S
			A01-02
COORDINATE	E		N
	79.911480		7.026186
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
Culvert # A1-2 @ Halandurawa Road			
			
Invert : U/S : 0.374 D/S : 0.468 (Source: 2018 F/S Report)			

SITE CONDITION



ID: B02a-03	JICA 2003 M/P	SLDC 2017	2018 F/S
			A01-03
COORDINATE	E		N
	79.909161		7.024109
PURPOSE	Culvert		
OPERATION	in use		
DRAWING			
Culvert # A1-3 @ Temple Road			
			
Invert : U/S : 0.386 D/S : 0.737 (Source: 2018 F/S Report)			
SITE CONDITION			
			
			

ID: B02a-04	JICA 2003 M/P	SLDC 2017	2018 F/S
			A01-04
COORDINATE	E		N
	79.908267		7.022846
PURPOSE	Pipe Culvert		
OPERATION	in use		
DRAWING			
<p>Culvert # A1-4 @ Elapitiwala School Road</p> <p>Invert : U/S : 0.386 D/S : 0.737</p> <p>(Source: 2018 F/S Report)</p>			

SITE CONDITION



2.3.7 Branch 3

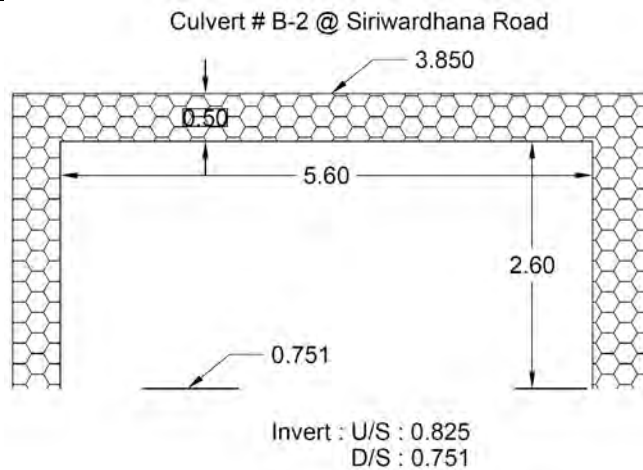
ID: B03-01	JICA 2003 M/P	SLDC 2017	2018 F/S
			B-01
COORDINATE	E		N
	79.921555		7.025133
PURPOSE	Railroad Bridge		
OPERATION	in use		
DRAWING			
Railway Bridge # B-1			
Invert : U/S : 0.937 D/S : 0.807 (Source: 2018 F/S Report)			

SITE CONDITION



ID: B03-02	JICA 2003 M/P	SLDLC 2017	2018 F/S
			B-02
COORDINATE	E		N
	79.921900		7.025236
PURPOSE	Bridge		
OPERATION	in use		

DRAWING



(Source: 2018 F/S Report)

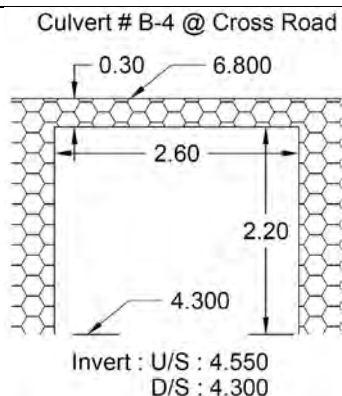
SITE CONDITION



ID: B03-03	JICA 2003 M/P	SLDLC 2017	2018 F/S
			B-03
COORDINATE	E		N
	79.926251		7.025739
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
<p>Culvert # B-3 @ Ragama - Kadawatha Road Culvert No.5/1</p>  <p>Invert : U/S : 3.710 D/S : 3.600</p> <p>(Source: 2018 F/S Report)</p>			
SITE CONDITION			
			
			

ID: B03-04	JICA 2003 M/P	SLDC 2017	2018 F/S
			B-04
COORDINATE	E		N
	79.929172		7.024995
PURPOSE	Culvert		
OPERATION	in use		

DRAWING



(Source: 2018 F/S Report)

SITE CONDITION



2.3.8 Branch 4

ID: B04-01	JICA 2003 M/P	SLLDC 2017	2018 F/S
COORDINATE	E		N
	79.916707		7.006728
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			


SITE CONDITION



ID: B04-02	JICA 2003 M/P	SLDC 2017	2018 F/S
COORDINATE	E		N
	79.916787		7.006858
PURPOSE	Bridge		
OPERATION	in use (temporary)		
DRAWING			

SITE CONDITION



ID: B04-03	JICA 2003 M/P	SLDC 2017	2018 F/S
			C-01
COORDINATE	E		N
	79.917882		7.006754
PURPOSE	Pipe Culvert		
OPERATION	in use		
DRAWING			
(Source: 2018 F/S Report)			
SITE CONDITION			
			

ID: B04-04	JICA 2003 M/P	SLDC 2017	2018 F/S
			C-02
COORDINATE	E		N
	79.921094		7.007323
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
<p>Bridge # C-2 @ Pinnameda Road</p> <p style="text-align: center;">BRIDGE PINNAMEDA ROAD</p> <p style="text-align: center;">Invert : U/S : -0.522 D/S : -0.760</p> <p style="text-align: center;">(Source: 2018 F/S Report)</p>			
SITE CONDITION			

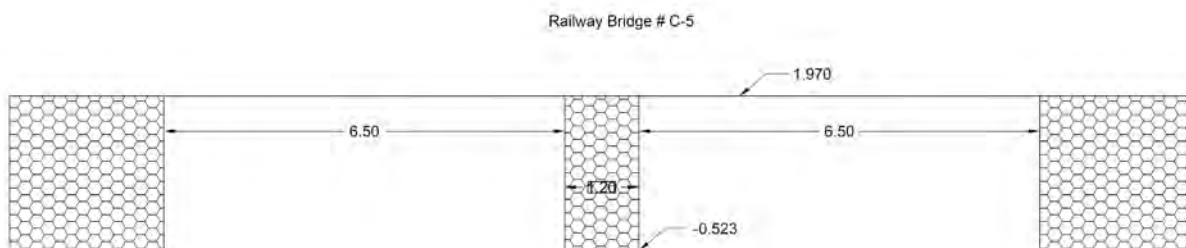
ID: B04-05	JICA 2003 M/P	SLDLC 2017	2018 F/S
			C-03
COORDINATE	E		N
	79.922044		7.011623
PURPOSE	Culvert		
OPERATION	in use		
DRAWING			
(Source: 2018 F/S Report)			
SITE CONDITION			
			
			

ID: B04-06	JICA 2003 M/P	SLDC 2017	2018 F/S
			C-4
COORDINATE	E		N
	79.920184		7.013185
PURPOSE	Culvert		
OPERATION	in use		
DRAWING			
(Source: 2018 F/S Report)			
SITE CONDITION			



ID: B04-07	JICA 2003 M/P	SLDC 2017	2018 F/S
			C-05
COORDINATE	E		N
	79.915177		7.010034
PURPOSE	Railroad Bridge		
OPERATION	in use		

DRAWING



RAILWAY BRIDGE

Invert : U/S : -0.045
D/S : -0.523

(Source: 2018 F/S Report)

SITE CONDITION

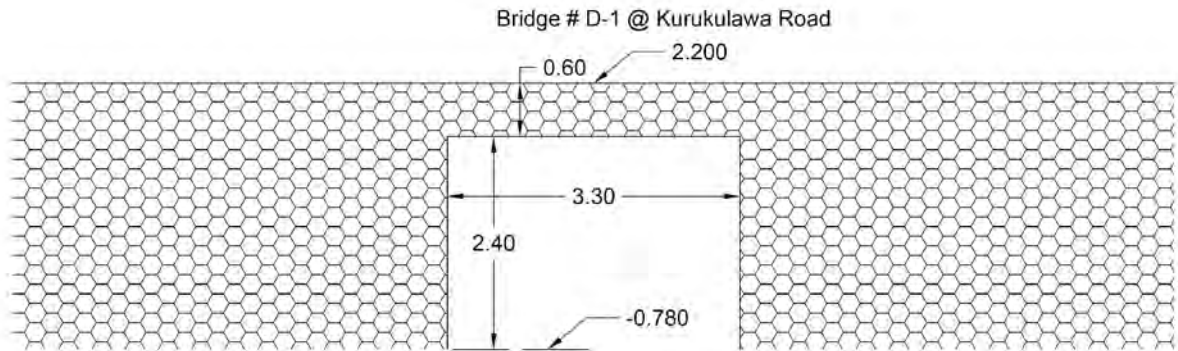




2.3.9 Branch 5

ID: B05-01	JICA 2003 M/P	SLDC 2017	2018 F/S
			D-01
COORDINATE	E		N
	79.926268		7.003954
PURPOSE	Culvert		
OPERATION	in use		

DRAWING



**BRIDGE
KURUKULAWA ROAD**
(Source: 2018 F/S Report)

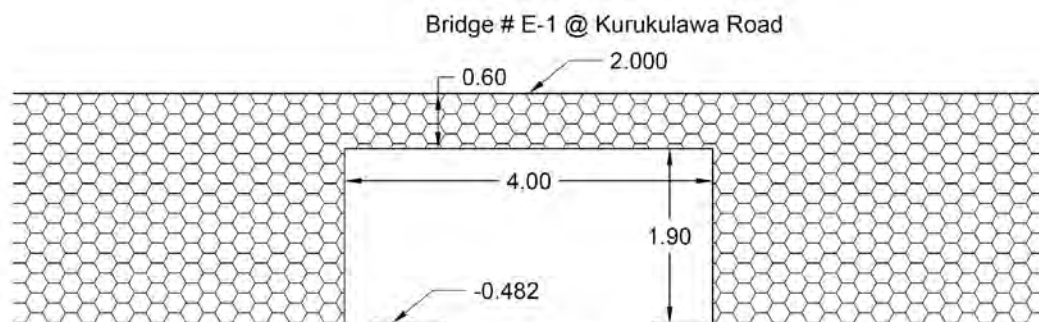
SITE CONDITION



2.3.10 Branch 6

ID: B06-01	JICA 2003 M/P	SLDLC 2017	2018 F/S
			E-01
COORDINATE	E		N
	79.926154		7.002770
PURPOSE	Bridge		
OPERATION	in use		

DRAWING



BRIDGE
KURUKULAWA ROAD

Invert : U/S : -0.391
D/S : -0.482

(Source: 2018 F/S Report)

SITE CONDITION

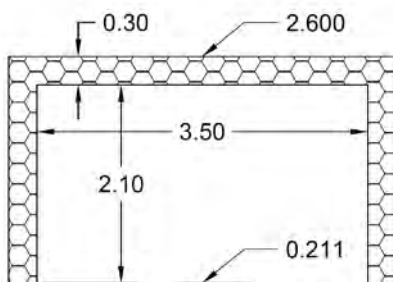


ID: B06-02	JICA 2003 M/P	SLDC 2017	2018 F/S
			E-02
COORDINATE	E		N
	79.928778		7.002455
PURPOSE	Anicut		
OPERATION	Not confirmed		
DRAWING			
Anicut # E-2			
<p>The drawing shows a cross-section of an anicut with three main sections. The left section has a width of 1.70 and a height of 1.10. The middle section has a width of 1.50 and a height of 0.109. The right section has a width of 1.200 and a height of 0.109. The invert level for the U/S is 0.272 and for the D/S is 0.109. The source is cited as the 2018 F/S Report.</p>			
SITE CONDITION			
No access			

ID: B06-03	JICA 2003 M/P	SLDC 2017	2018 F/S
			E-03
COORDINATE	E		N
	79.932253		7.002164
PURPOSE	Culvert		
OPERATION	in use		

DRAWING

Culvert # E-3 @ Lazaras Road



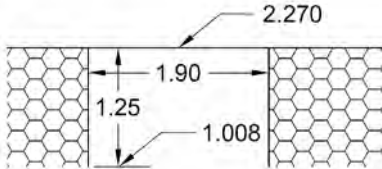

Invert : U/S : 0.588
D/S : 0.211

(Source: 2018 F/S Report)

SITE CONDITION



ID: B06-04	JICA 2003 M/P	SLDC 2017	2018 F/S
			E-04
COORDINATE	E		N
	79.933175		7.003041
PURPOSE	Anicut		
OPERATION	in use		
DRAWING			
Anicut # E-4			
Invert : U/S : 0.988 D/S : 0.965 (Source: 2018 F/S Report)			
SITE CONDITION			

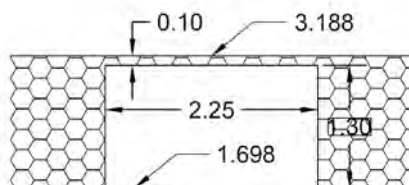
ID: B06-05	JICA 2003 M/P	SLDLC 2017	2018 F/S
			E-05
COORDINATE	E		N
	79.935122		7.004828
PURPOSE	Anicut		
OPERATION	in use		
DRAWING			
Anicut # E-5			
			
Invert : U/S : 1.242 D/S : 1.008 (Source: 2018 F/S Report)			
SITE CONDITION			
			

ID: B06-06	JICA 2003 M/P	SLDC 2017	2018 F/S
			E-06
COORDINATE	E		N
	79.935729		7.006618
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
Culvert # E-6 @ Church Road			
Invert : U/S : 1.378 D/S : 0.963 (Source: 2018 F/S Report)			
SITE CONDITION			

ID: B06-07	JICA 2003 M/P	SLDC 2017	2018 F/S
			E-07
COORDINATE	E		N
	79.936242		7.008337
PURPOSE	Anicut		
OPERATION	in use		

DRAWING

Anicut # E-7



Invert : U/S : 1.809
D/S : 1.698

(Source: 2018 F/S Report)

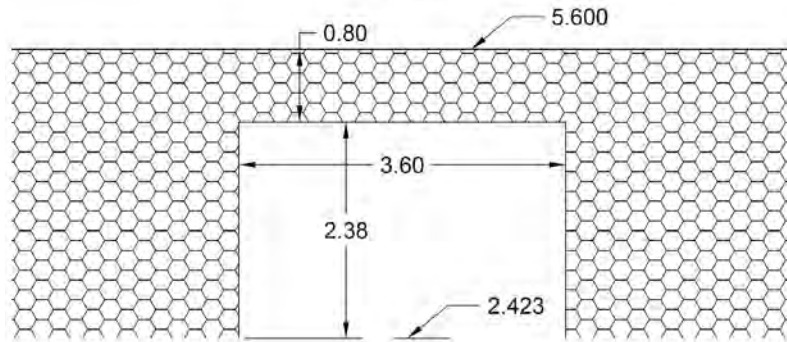
SITE CONDITION



ID: B06-08	JICA 2003 M/P	SLDC 2017	2018 F/S
			E-08
COORDINATE	E		N
	79.939138		7.009156
PURPOSE	Bridge		
OPERATION	in use		

DRAWING

Culvert # E-8 @ Kadawatha - Ragama Road
(No.2/3)



Invert : U/S : 2.563
D/S : 2.423

(Source: 2018 F/S Report)

SITE CONDITION



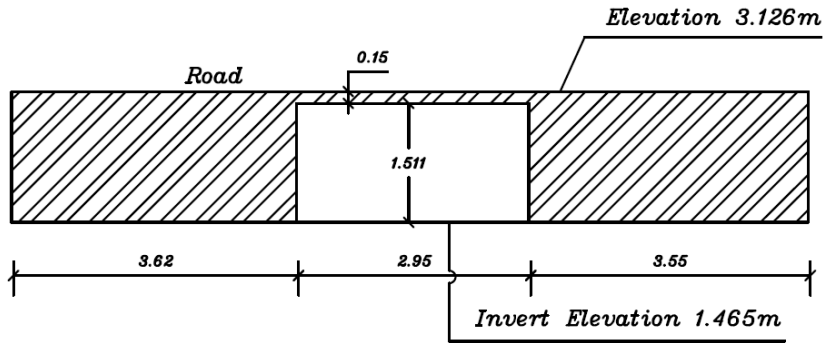
ID: B06a-01	JICA 2003 M/P	SLDC 2017	2018 F/S
			E01-01
COORDINATE	E		N
	79.930666		7.003743
PURPOSE	Pipe Culvert		
OPERATION	in use		
DRAWING			
Culvert # E1-1 @ Church Road			
Invert : U/S : 0.095 D/S : 0.074 (Source: 2018 F/S Report)			
SITE CONDITION			

ID: B06b-01	JICA 2003 M/P	SLDC 2017	2018 F/S
			E02-01
COORDINATE	E		N
	79.929826		7.000882
PURPOSE	Pipe Culvert		
OPERATION	in use		
DRAWING			
Culvert # E2-1 @ Cross Road			
			
Invert : U/S : 0.633 D/S : 0.412 (Source: 2018 F/S Report)			
SITE CONDITION			
			
			

2.3.11 Branch 7

ID: B07-01	JICA 2003 M/P	SLDC 2017	2018 F/S
	Culvert at 4+743		F-01
COORDINATE	E		N
	79.934581		6.982060
PURPOSE	Culvert		
OPERATION	in use		

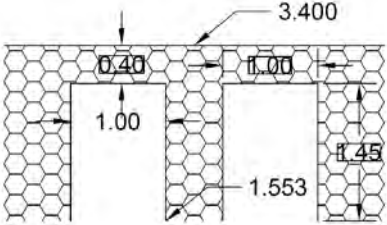
DRAWING



(Source: JICA 2003 M/P Report)

SITE CONDITION

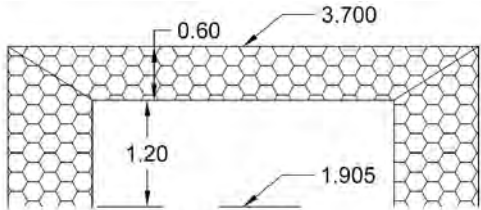



ID: B07-02	JICA 2003 M/P	SLDLC 2017	2018 F/S
			F-02
COORDINATE	E		N
	79.933874		6.981126
PURPOSE	Bridge		
OPERATION	in use		
<p>Culvert # F-2 @ Cross Road</p>  <p>Invert : U/S : 1.590 D/S : 1.553</p> <p>(Source: 2018 F/S Report)</p>			

SITE CONDITION



ID: B07-03	JICA 2003 M/P	SLDLC 2017	2018 F/S
COORDINATE	E		N
	79.930472		6.979379
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
Bridge # F-3 @ Cross Road (In front of Kiribathgoda Bus Stand)			
Invert : U/S : 1.601 D/S : 1.530 (Source: 2018 F/S Report)			
SITE CONDITION			

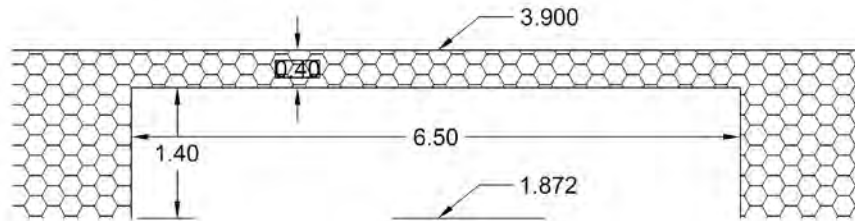
ID: B07-04	JICA 2003 M/P	SLDC 2017	2018 F/S
	Culvert at 3+964		F-04
COORDINATE	E		N
	79.929577		6.977703
PURPOSE	Bridge		
OPERATION	in use		
DRAWING			
<p>Culvert # F-4 @ Jinadasa Nandasena Mawatha</p>  <p>Invert : U/S : 1.920 D/S : 1.905</p> <p>(Source: 2018 F/S Report)</p>			
SITE CONDITION			
			

ID: B07-05	JICA 2003 M/P	SLDC 2017	2018 F/S
	Culvert at 3+932		F-05
COORDINATE	E		N
	79.929469		6.977460
PURPOSE	Culvert		
OPERATION	in use		
DRAWING			
<p>Culvert # F-5 @ Makola Road</p> <p>Invert : U/S : 1.870 D/S : 1.650</p> <p>(Source: 2018 F/S Report)</p>			
SITE CONDITION			

ID: B07-06	JICA 2003 M/P	SLDC 2017	2018 F/S
			F-06
COORDINATE	E		N
	79.929334		6.976658
PURPOSE	Bridge		
OPERATION	in use		

DRAWING

Culvert # F-6 @ Entrance to UDESHI TRADERS



Invert : U/S : 1.910
D/S : 1.872

(Source: 2018 F/S Report)

SITE CONDITION

