

Initial Environmental Examination

April 2016
Project Number: 47381-002

SRI: Mahaweli Water Security Investment Program

Proposed Raising of the Minipe Anicut and Rehabilitation of the Minipe Left Bank Canal Project
in Kandy District

Addendum to IEE
(compliant with ADB Safeguard Policy Statement 2009)

Prepared by Ministry of Mahaweli Development and Environment for the Asian Development Bank.

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Mahaweli Water Security Investment Program

Program Management, Design and Supervision Consultant

ADDENDUM TO IEE REPORT, INCLUDING THE REVISED EMP ON MINIPE ANICUT RAISING
AND REHABILITATION OF MINIPE LB CANAL PROJECT

ADDENDUM to IEE Report - MLBCRP

April 2016



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1 OVERVIEW

1. This document is prepared by the Project Management & Design Supervision Consultant (PMDSC) of the Mahaweli Water Security Investment Program (MWSIP), with the Programme Management Unit (PMU) established under the Ministry of Mahaweli Development and Environment, as an addendum to the Initial Environmental Examination Report (IEER) dated April 2015 and approved by the Central Environmental Authority (CEA) on 16 October 2015.

1.1 Technical Features

2. The key technical features changed during the design review of Mini-pe Left Bank Canal Rehabilitation Project (MLBCRP) are given in the Table 1 below.

Table 1: Technical Features

Parameter	Existing	Proposed
Anicut Weir		
Type	Ogee section and Retaining wall section	Ogee type weir
Length	Main Ogee: 225.0 m Side retaining wall: 115.0 m Total length: 340.0 m	Total Ogee weir length: 373m
Crest Level	Ogee: 114.0 masl Retaining wall: 115.0 masl	117.5 masl
Maximum Height	4.0 m	7.5 m (from lowest level)
Left Bank Sluice		
Gate Type	Manually operated steel sliding gates	Electrically operated steel roller gates
Number of gates	3	3
Size of gates	2 / 3.50m x 1.52m 1 / 3.50m x 0.92m	3 Nos with: 3.5 (width) x 1.75 (height)
Sill Level	111.88 masl	111.88 masl
Pier Top Level	118.3 masl	121.5 masl
Trash Rack	No trash rack at present	A trash rack will be installed
Left Bank Silt Excluder		
Gate Type	Manually operated wooden sliding gates	Electrically operated steel roller gates

Number of gates	4	2
Size of gates	1.50m x 0.91m	3.0m x 3.0m
Sill Level	3 bays at 111.25 masl 1 bay at 110.99 masl	109.5 masl
Right Bank Head Sluice		
Gate Type	Electrically operated steel sliding gates	No change to the existing structure
Number of gates	6	
Size of gates	2.75m x 3.0m	
Sill Level	111.10 masl	
Pier top level	121.0 masl	Protection wall with top level of 121.5masl
Trash Rack		
Right Bank Silt Excluder		
Type	Manually operated radial gates	Electrically operated
Number of gates	2	
Size of gate	1.50m x 3.0m	
Sill Level	109.5 masl	
Central Silt Ejector – NEW		
Location		
Type of gate		Steel sliding gate
Number of gates		01
Gate size		2.0 (width) x 1.5 (height)
Sill level		109.5 masl
Flank Bund – NEW		
Type		Earthen bund
Length		103.0 m
Top width		2 m
Top level		121.5 masl

Other		
Gabion wall at Right Bank	New	220.0 m
Emergency Spill at RB Canal		
Location		1+740 (km+m)
Length		40.0 m
Canal Spill Crest Level		113.852 masl

1.2 Project Details

1.2.1 Project Components

3. The project components of the proposed project mentioned under the section B.2 (Para 49) has no changes except the printing mistake corrected under No 5 component (“Sluice” replaced with “bank”. The main components are given below;

1. Raising the existing Minipe Anicut
2. Modification of the LB sluice
3. Modification of the LB Silt Excluder
4. Construction of an additional silt excluder
5. Introduction of necessary protective measures to the RB Bank
6. Rehabilitation and improvement of the LB main canal

4. The area that will be inundated due to raising the Minipe anicut has been reduced from 25 ha to 23 ha by reducing the weir height from 118.0 m to 117.5 m, which is the main design change of the proposed project and also the weir type has been changed from the Piano Key type to Ogee type (refer Annexure 1 for the Design Layout of the raised anicut). Hence, the number of trees to be felled at the weir location will be reduced, and the water spread areas including the trees identified to be felled are given in the Annexure 2.

1.2.2 Irrigation Infrastructure

(a) Reservoir details

5. The proposed raising of the Minipe anicut will increase the storage capacity of the Minipe pool by 0.88 MCM, which will be sufficient to accommodate the water released by the Rantembe powerhouse during the peak power generation periods of the day (05.00 to 07.00 and 18.00 to 22.00). The design change of Minipe pool capacity from 1.26 MCM (at the height of 118.0 masl) to 1.06 MCM (at the height of 117.5 masl) will enable to spill an additional amount of water through Mahaweli River compared to the original design, which will be an added advantage to the downstream ecology.

(b) Revised design improvements to the existing structures

6. The proposed revised design improvements to the existing structures compared to the IEE report submitted (April 2015) for the CEA and ADB approval are as follows;

- I. Raising Minipe Anicut from its current level of 114 masl to 117.5 masl.
- II. Extending the anicut along the axis of the existing retaining wall and thereby joining the left bank end of the anicut to LB silt excluder, embedding the retaining wall. The extended anicut will have the Ogee type weir and the crest elevation of 117.5 masl.
- III. Construction of a 220 m long gabion structure on the right bank to protect the toe of the slope from erosion and instabilities due to the fluctuation of the water level as recommended by the National Building Research Organization (NBRO).
- IV. Make necessary modification to the LB sluice corresponding to the new anicut level and afflux at design discharge.
- V. Modify the LB silt excluder to ensure efficient silt exclusion.
- VI. Construct an additional silt excluder at the middle section to improve the silt removal after the raising of the anicut.
- VII. Introduce necessary protective measures to the RB sluice after raising the anicut.
- VIII. Rehabilitation and improvements to the LB main canal as mentioned under Paragraph 59 of the IEE report (April, 2015). However, it should be highlighted that the improvements for the approach to deeper sections of the LB canal will not be carried out as mentioned under Paragraph 59 of IEE of April 2015.
- IX. Construction of a short weir (approximately 0.5m) across the Mahaweli River, 15 to 20 m downstream of the Minipe Anicut

(c) New structures to be introduced

7. Construction of Environmental Flow Tube on a higher level than the silt ejector level, as recommended by the Department of Wild Life Conservation in the CEA conditional approval, is included in the design in the ogee weir as a new structure to the LB sluice.
8. The other new structures mentioned under the Paragraph 60, except the spill for Berabun Oya, remain as they are.

1.2.3 Construction activities

9. The construction activities of the Minipe Left Bank Canal Rehabilitation have been divided into the following 4 stages and, will be implemented under 6 different contract packages.

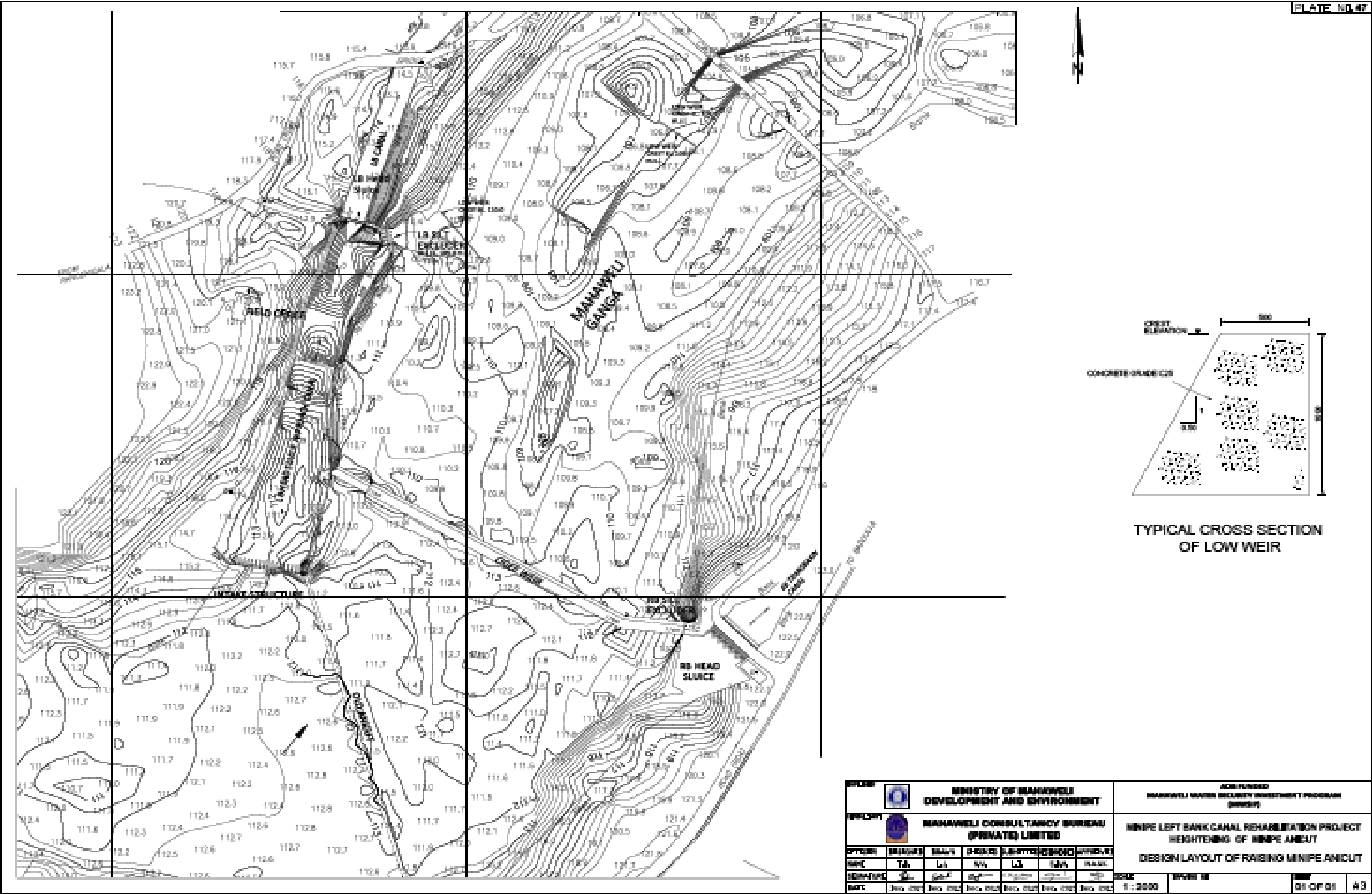
(i) MLBCR-NCB-1	Rehabilitation of Minipe LB Canal (0+000km to 30+140km) - Stage 1
(ii) MLBCR-NCB-2	Rehabilitation of Minipe LB Canal (30+140km to 49+820km) - Stage 2
(iii) MLBCR-NCB-3	Rehabilitation of Minipe LB Canal (49+820km to 63+650km) - Stage 3
(iv) MLBCR-NCB-4	Rehabilitation of Minipe LB Canal (63+650km to 73+960km) - Stage 4
(v) MLBCR-G-1	Rehabilitation and Improvements to Gated Control Structures
(vi) MLBCR-ICB-1	Raising of Crest of Minipe Anicut and Water Control and Measurement Facilities
10. The tentative construction schedule is given in the Annexure 3
11. The required mitigatory measures are described in detail in the revised EMP, prepared as a separate document, which shall be used by the Contractor to prepare the Contractor's EMP. The environmental flow that will be released from the Minipe Anicut is designed as 1.6 m³/sec and 3.2 m³/sec, during the cultivation and non-cultivation season (30th January to 15th April and 25th August to 15th

November respectively). Two dedicated cast iron gates are designed for the release of e-flow continuously, as per the conditions laid by the Department of Wild Life Conservation (refer to Annexure 4 for design layout).

ANNEXURE 1

Design Layout for raising Minipe anicut

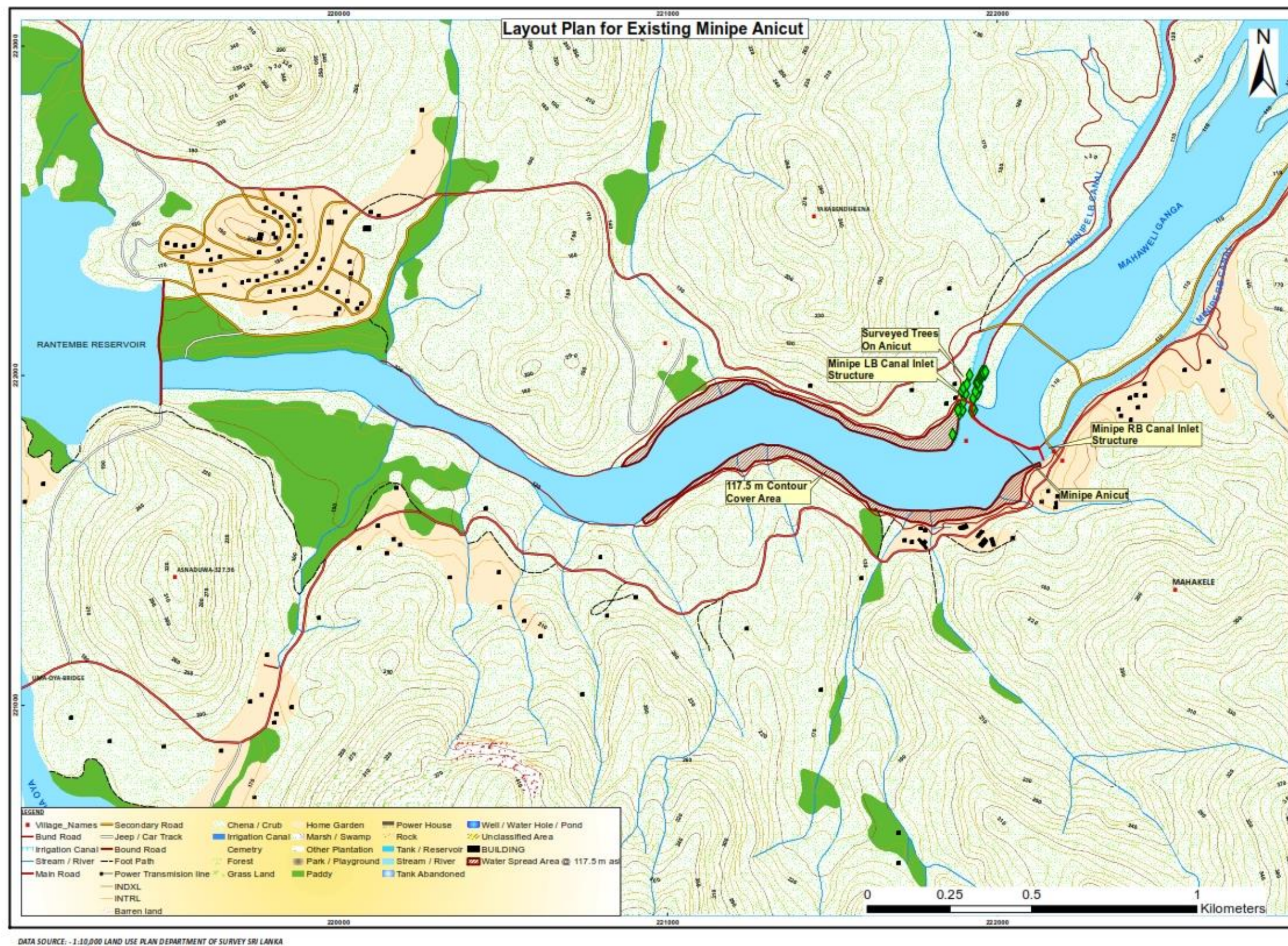
ANNEXURE 1: Design Layout for raising Minipe anicut



ANNEXURE 2

Map of water spread area

ANNEXURE 2 : Map of water spread area



ANNEXURE 3

Implementation Schedule of MLBCRP

ANNEXURE 3 : Implementation Schedule of MLBCRP

			Revise Tender Designs										Approval by PMU and ADB										Bidding and Contract Award										Construction										Defects Liability Period																								
No.	Package	Milestones and Construction Activities	2016													2017													2018													2019													2020												
			2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60						
			PMDSC - 1																																																																
TRANCHE 1 (2016 - 2021)																																																																			
MLBCR	Minipe Left Bank Canal Rehabilitation																																																																		
1	MLBCR-ICB-1	Raising of Crest of Minipe Anicut and Water Control and Measurement Facilities																																																																	
2	MLBCR-NCB-1	Rehabilitation of Minipe LB Canal (0+000km to 30+140km) - Stage 1																																																																	
3	MLBCR-NCB-2	Rehabilitation of Minipe LB Canal (30+140km to 49+820km) - Stage 2																																																																	
4	MLBCR-NCB-3	Rehabilitation of Minipe LB Canal (49+820km to 63+650km) - Stage 3																																																																	
5	MLBCR-NCB-4	Rehabilitation of Minipe LB Canal (63+650km to 73+960km) - Stage 4																																																																	
6	MLBCR-G-1	Rehabilitation and Improvements to Gated Control Structures																																																																	

ANNEXURE 4

Design layout of environmental flow gate

LB HEAD SLUICE

LB SILT EJECTOR

2 NO. 5 300 Ø CAST IRON GATES FOR ENVIRONMENT WATER RELEASE

IRRIGATION DEPARTMENT FIELD OFFICE

PROPOSED EARTHEN FLANK BUND 121.5M MSL

508 HOLES AT 900 INTERVALS C/C

LB APPROACH CANAL

MIDDLE SILT EJECTOR

MAHAWEI GANGA

MAHAWEI GANGA

RB HEAD SLUICE

SCALE 1 : 1250