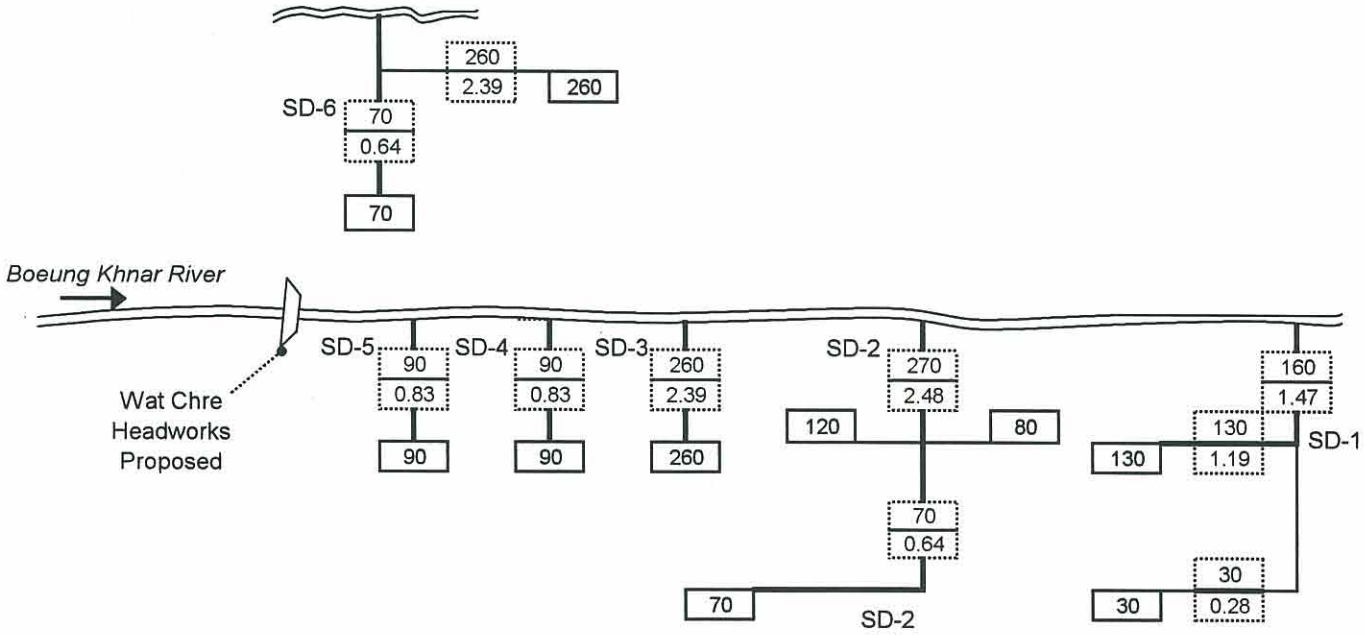

Unit drain. Req.= 6.32 lit/sec/ha from paddy fields
Unit drain. Req.= 25~18 lit/sec/ha from other types of land
Secondary drain
Collector drain
80 Secondary or tertiary block in Ha
260 / 2.39 Drainage area in Ha (85% of paddy fields, 15% of other land types) / Design discharge of drain in m3/sec

Length of Drains in kiometer		
Secondary drains (SD-xx):	SD-1:	2.2
	SD-2:	2.2
	SD-3:	3.5
	SD-4:	2.1
	SD-5:	1.5
	SD-6:	1.8
	SD-7:	1.5
Total of Secondary Drains:		14.8

Figure 5.6-2 Drainage Area Diagram of Wat Chre Rehabilitation Sub-project

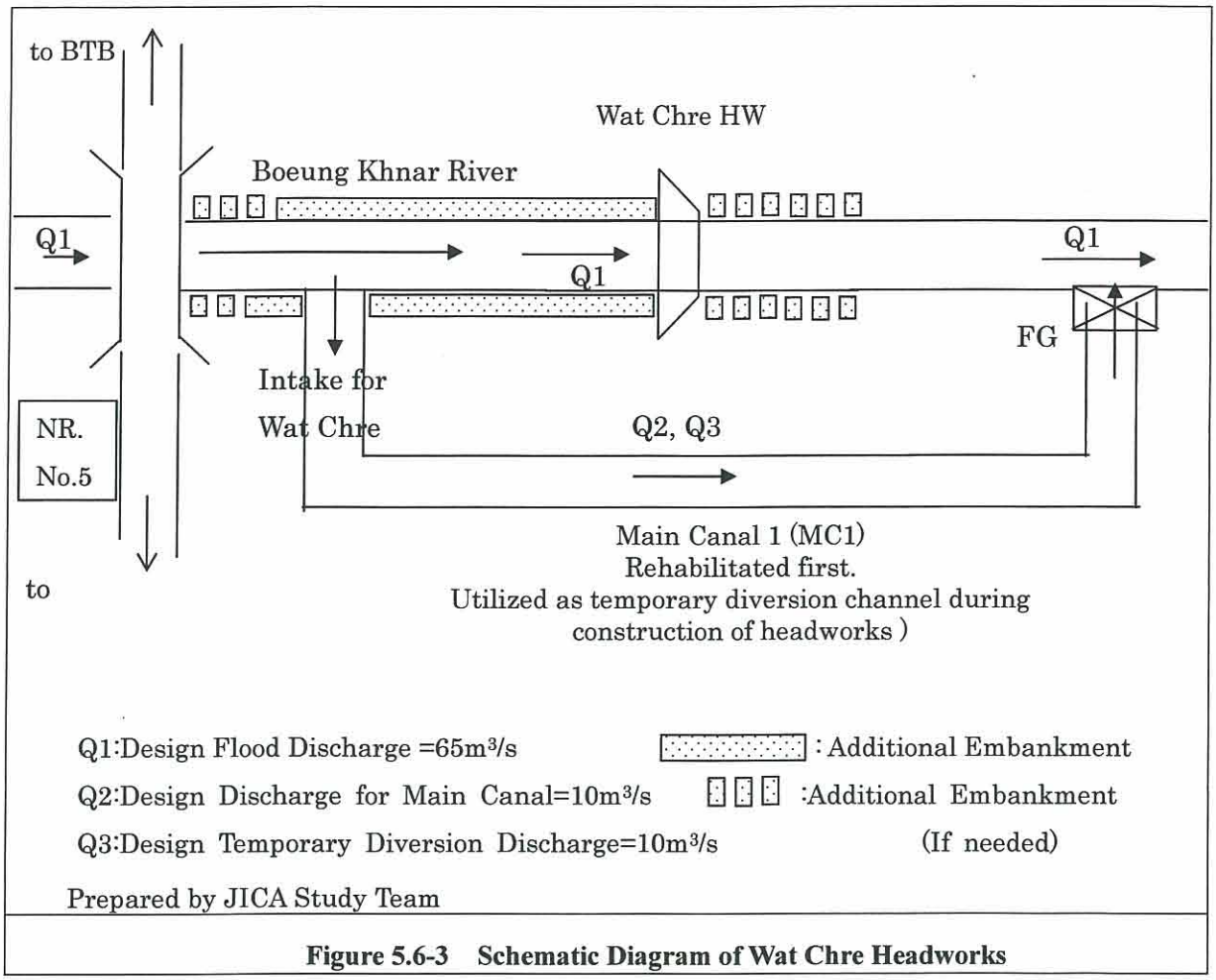

Figure 5.6-3 Schematic Diagram of Wat Chre Headworks

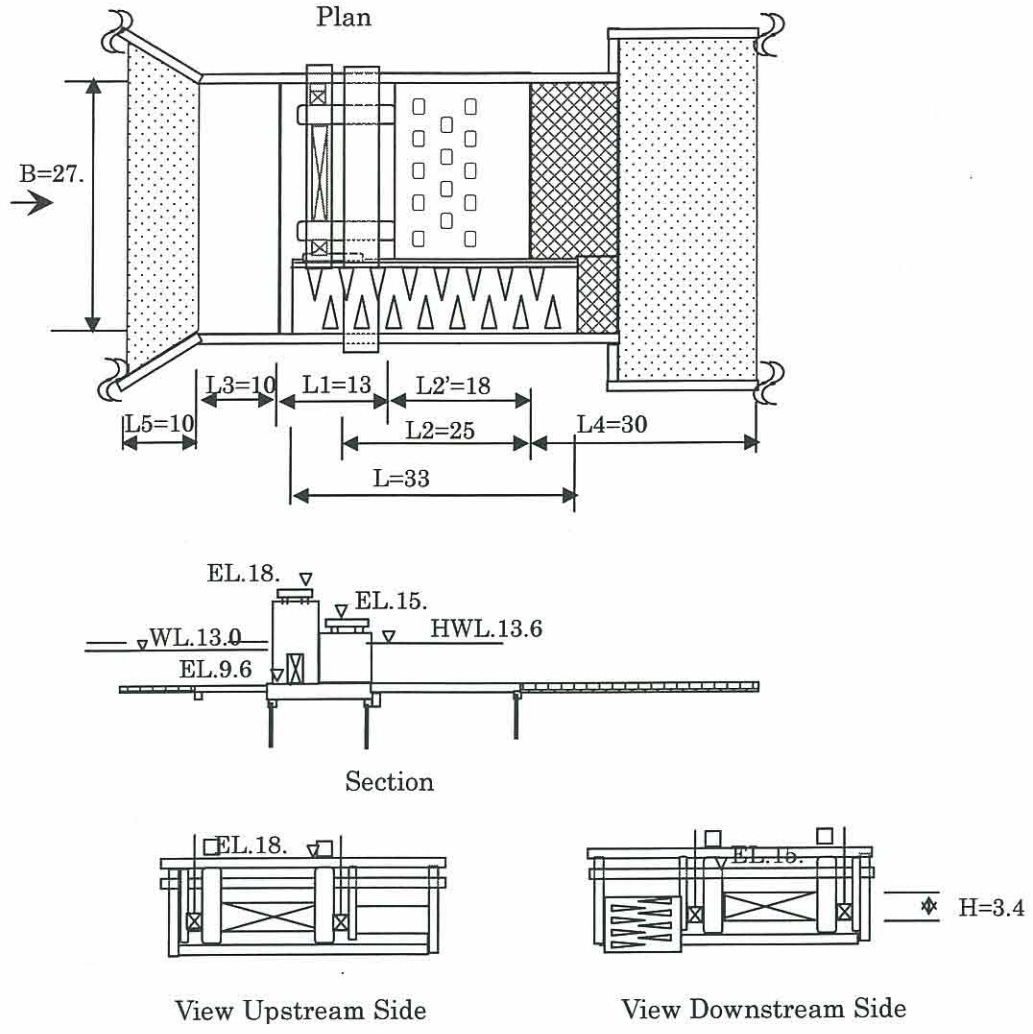

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Figure 5.6-4 Schematic Drawing of Wat Chre Diversion Weir

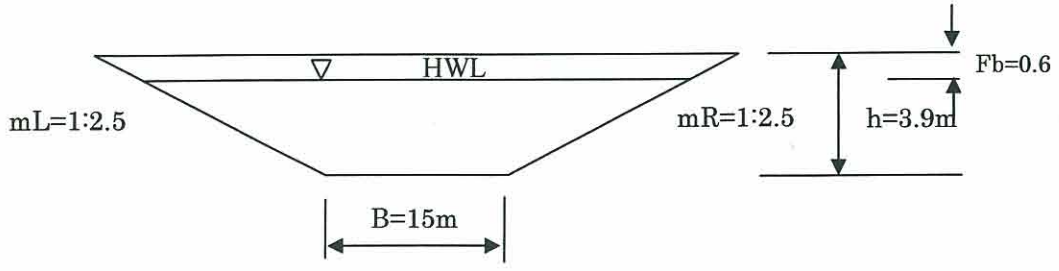

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Figure 5.6-5 Proposed Typical Cross Section of Boeng Khnar River

Summary for Design of Wat Chre Intake

Design Parameter	Condition	Remarks
Location:	xxx m upstream from the diversion weir	Right side of the Boeung Khnar River
Design Intake Discharge rate:	Q: 1.39 m^3/s	Wat Chre Sub-project A=1,020 ha
Irrigation Water Level WL1:	WL. 13.00m	Top of Gate. Overflow depth=0.2m
Elevation at Inlet (River bed):	EL. 9.60m	
Elevation at Inlet (Intake):	EL. 12.10m	>11.7 (within upper 0.4 of water depth of the river (referring to Japanese design criteria for headworks))
Gate Sill Elevation:	EL. 12.10m	
Width, Height and Length	Width: 1.0m, Height: 2.4m Length: 6.0m, (+ Apron length)	Breast wall is installed between EL. 13.1m and EL.14.5m to prevent the entrance of flood water.
Gate Type and Gate Size, nos.	Slide gate, B:1.0 x H:1.0 x 1 nos.	
Bridge	Total width 2.0 m	

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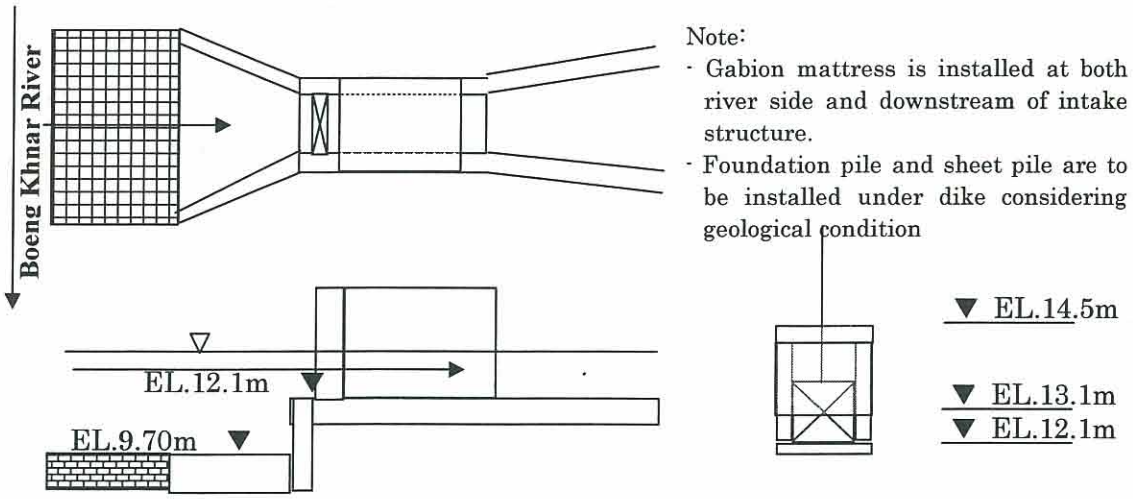

Prepared by JICA Study Team

Design Elevation of Intake Inlet:

Elevation of an intake is to be designed, considering the design water depth of the both river and intake at inlet, in order to reduce and minimize the entrance of suspended particle (sediment). Water depth at inlet of intake is desirable to be within upper 0.4 of that of river (referring to Japanese design criteria for headworks, referring to 5.2.4 (1) 4)):

Figure 5.6-6 Schematic Drawing of Wat Chre Intake

Summary for Design of Main Canal of Wat Chre Sub-project

Design Parameter	Condition	Remarks
Irrigation water requirement:	Q1: 1.39 m^3/s	Maximum discharge for irrigation
Design Discharge	Q2: 3.0 m^3/s	Max. during Mid-Nov. – End. May
Canal bed Inclination	1/ 3,000	Refer to landscape
Canal Base width, top width	B1:2.6 m, B2:5.8 m	Irrigation canal dimension
Canal Side Slope, Maning's n coefficient Freeboard	m : 1:1.0 n : 0.025 Fb: 0.8 m	MOWRAM design criteria for Irr. main canal class with sandy soil applied.
Canal Height,	H: 3.0m,	Present condition
Water Depth	h1: 0.81m (Q1=1.39 m^3/s) h2: 1.25m (Q2=3.0 m^3/s) Hmax:1.6 m(Qmax=7.1 m^3/s)	hmax: Fb=0

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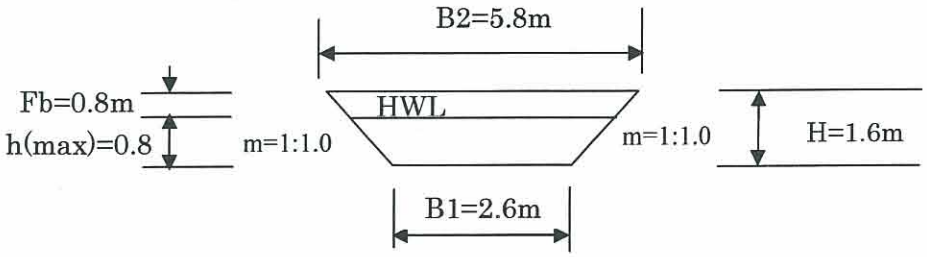

Prepared by JICA Study Team

Figure 5.6-7 Schematic typical section of Wat Chre Main Canal

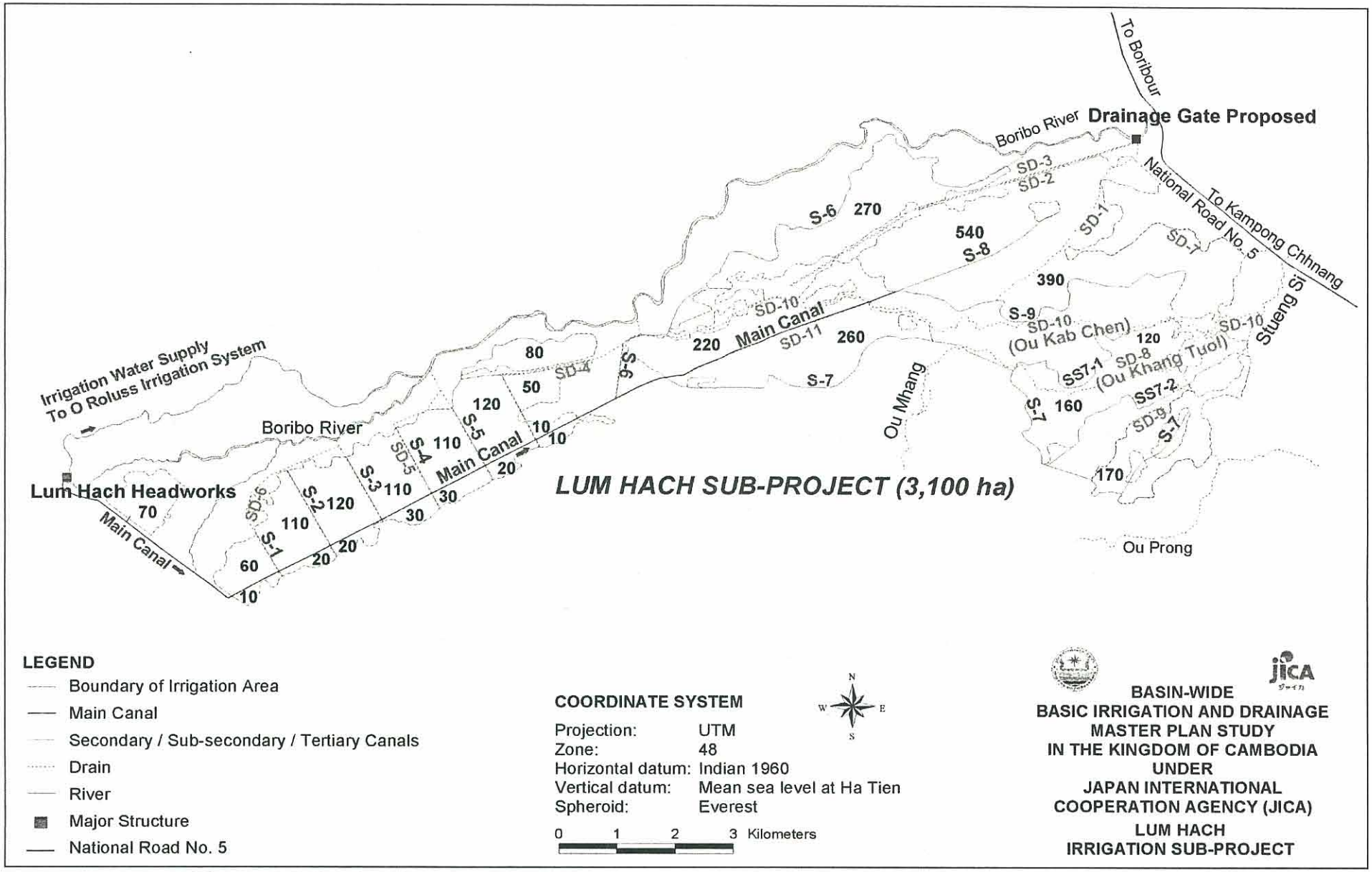

Figure 5.7-1 Irrigation and Drainage Canal Layout of Lum Hach Rehabilitation Sub-project

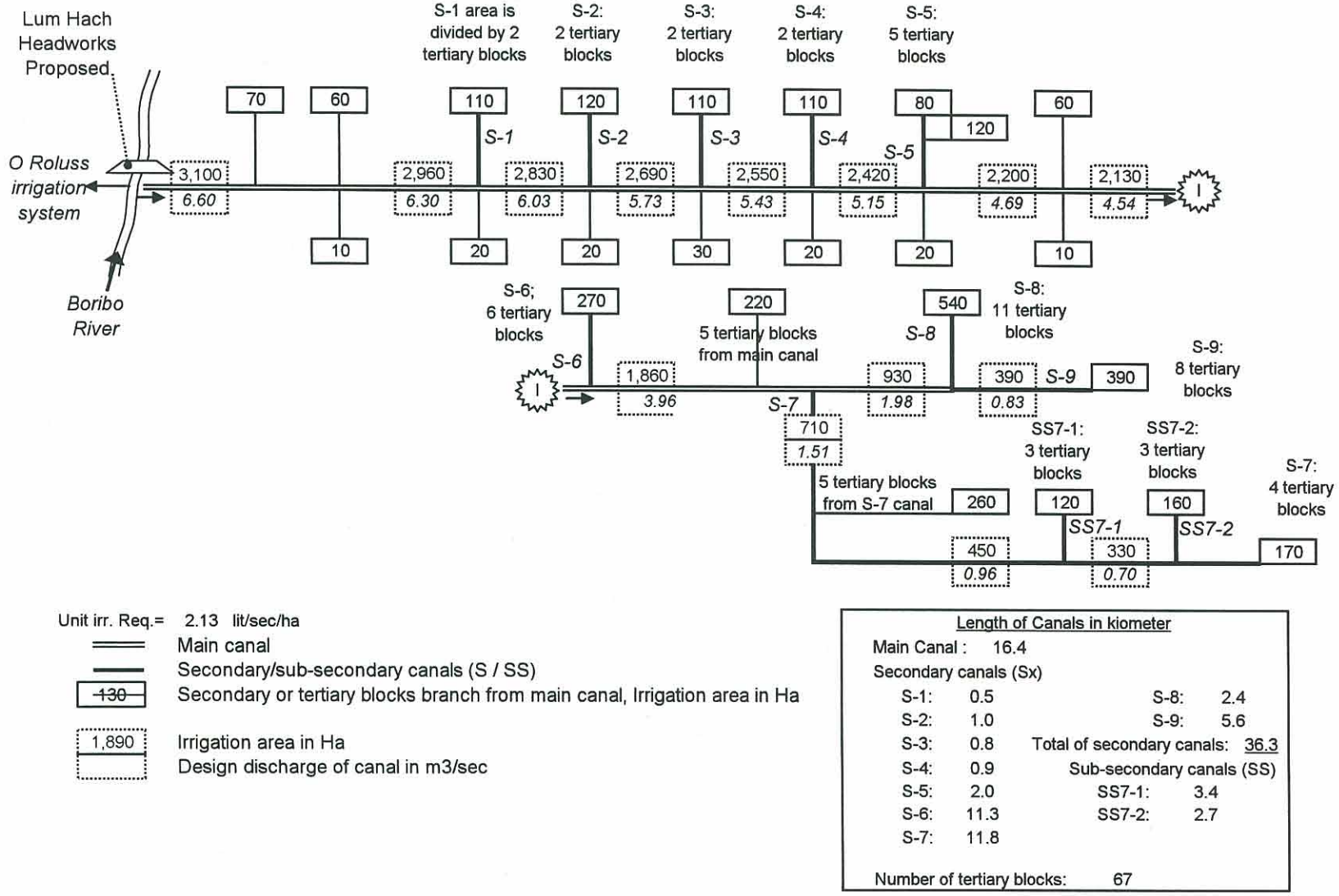

Figure 5.7-2 Irrigation Area Diagram of Lum Hach Rehabilitation Sub-project

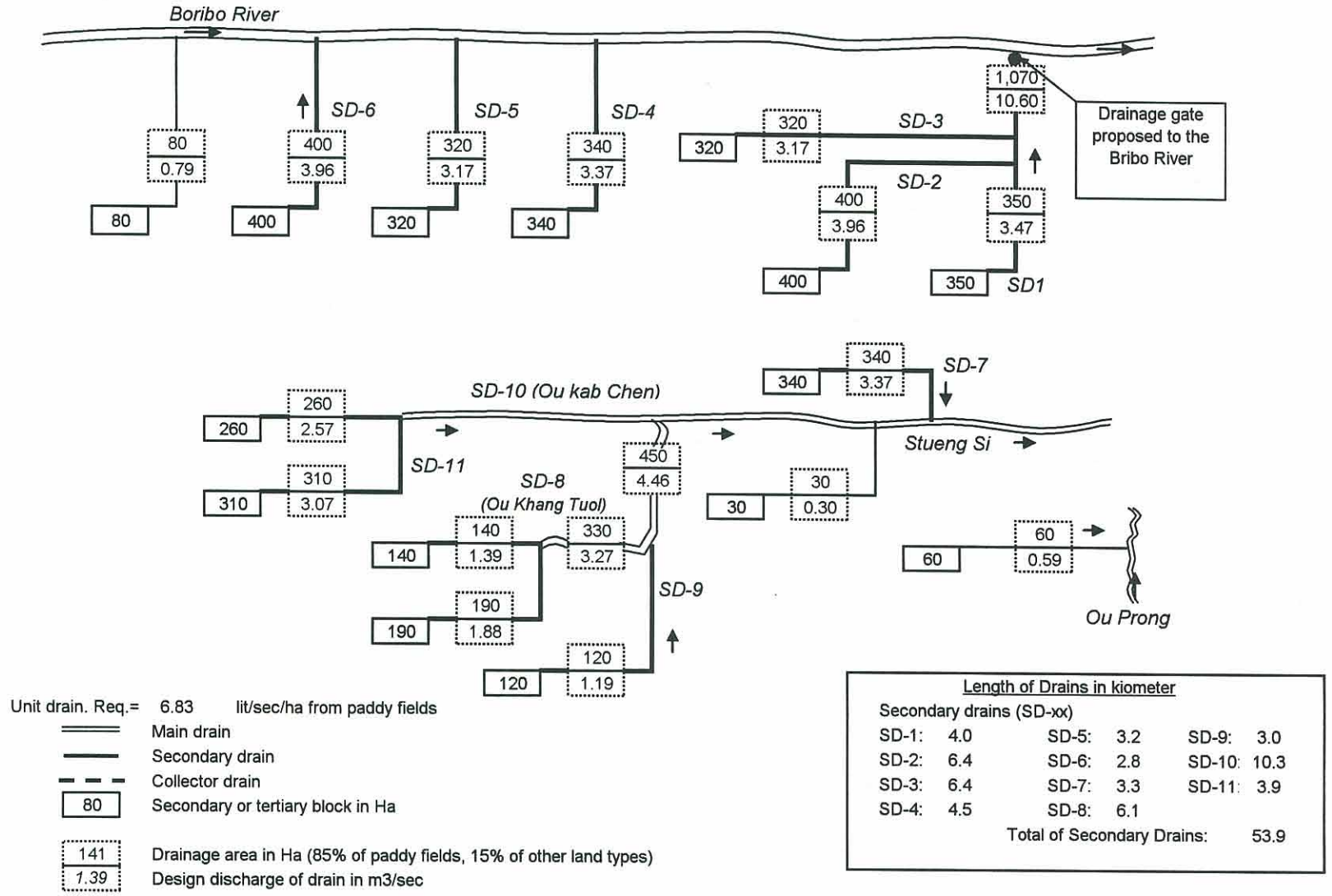

Figure 5.7-3 Drainage Area Diagram of Lum Hach Rehabilitation Sub-project

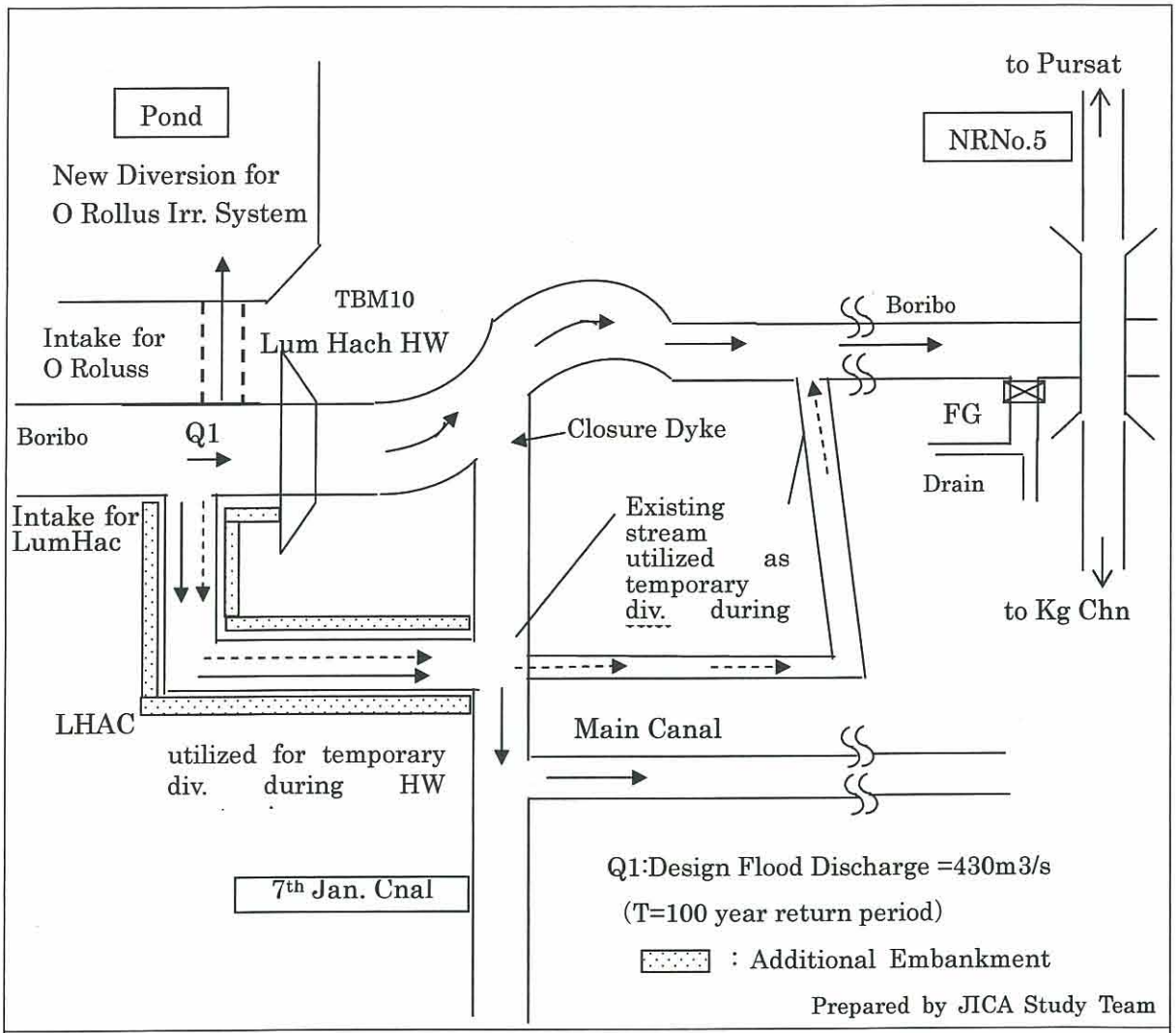

Figure 5.7-4 Schematic Diagram of Lum Hach Headworks and Lum Hach Sub-Project

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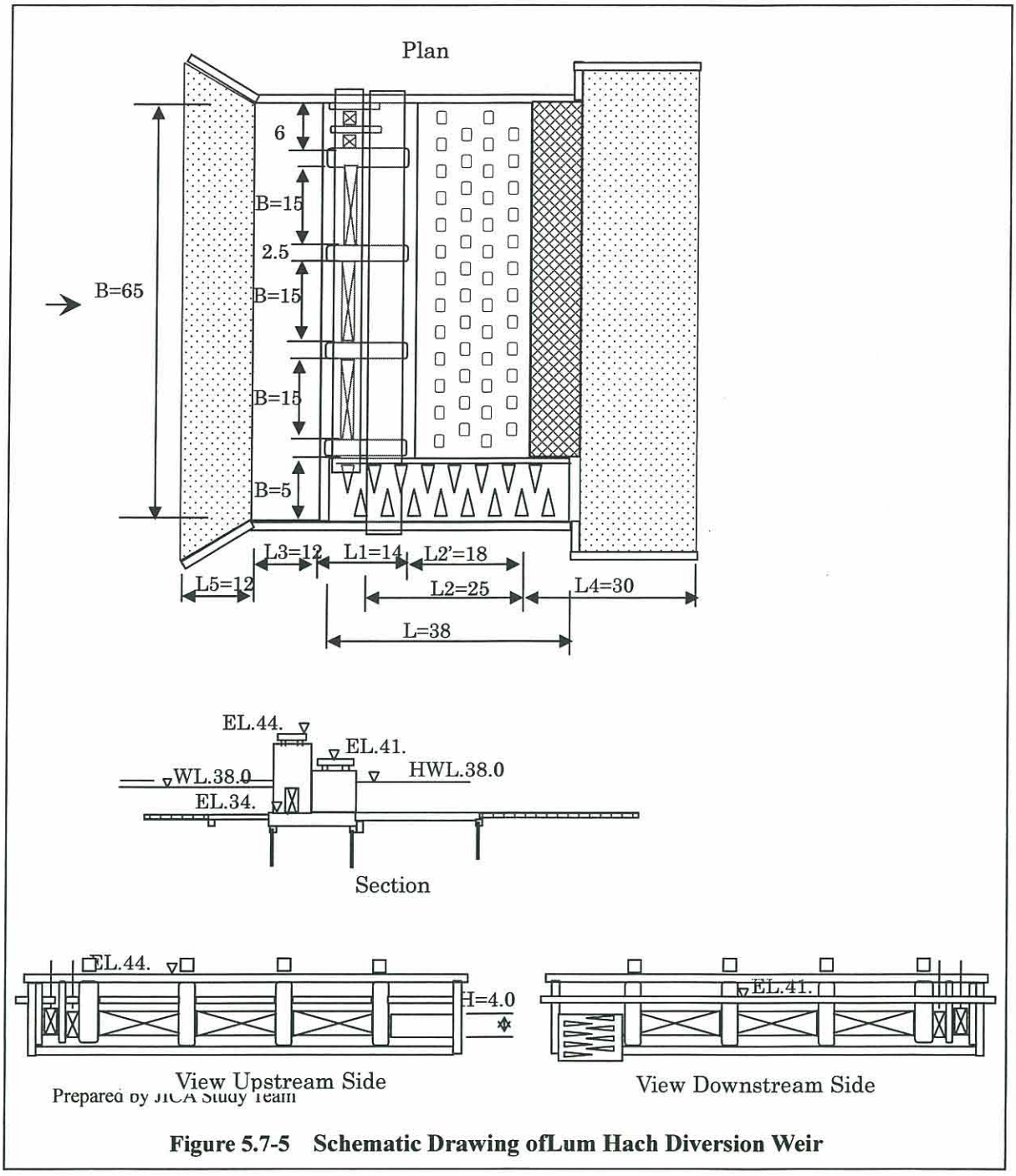

Figure 5.7-5 Schematic Drawing ofLum Hach Diversion Weir

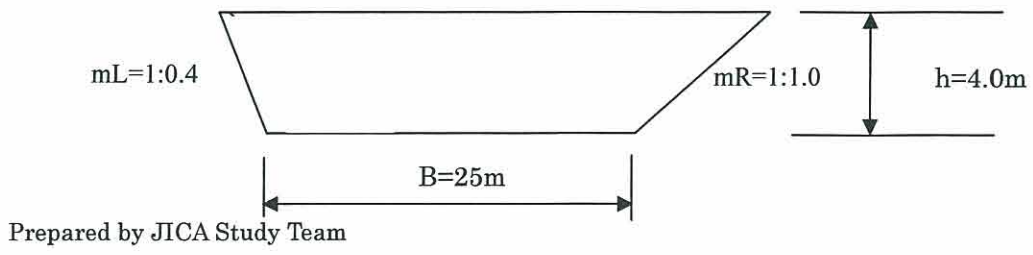

Figure 5.7-6 Proposed Cross Section of Boribo River in Downstream of the Weir

Summary for Design of Lum Hach Intake

Design Parameter	Condition	Remarks
Location:	xxx m upstream from the diversion weir	Right side of the Boribo River
Design Intake Discharge rate:	Q: 6.60 m^3/s	Lum Hach Sub-project A=3,100 ha
Irrigation Water Level WL1:	WL. 38.00m	Top of Gate. Overflow depth=0.2m
Elevation at Inlet (River bed):	EL. 34.00m	
Elevation at Inlet (Intake):	EL. 35.20m	>=35.2 (within upper 0.4 of water depth of the river (referring to Japanese design criteria for headworks))
Gate Sill Elevation:	WL. 35.20m	
Width, Height and Length	Width: 7.1m, Height: 3.8m, Length: 9.5m, (+ Apron length)	Breast wall is installed between EL. 36.7 and EL.39.0 to prevent The entrance of flood water.
Gate Type and Gate Size, nos.	Slide gate, B:1.5 x H:1.5 x 3 nos.	
Bridge	Total width 4.0 m	

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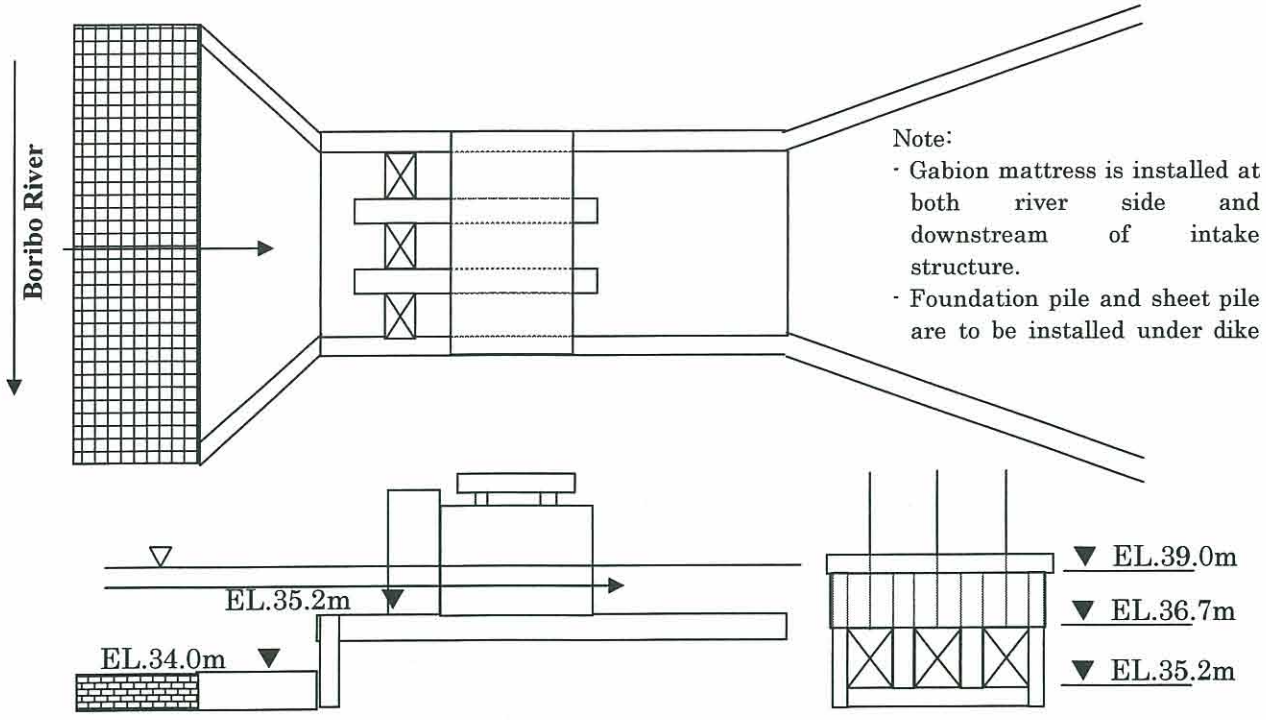

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Figure 5.7-7 Schematic Drawing of Lum Hach Intake

Summary for Design of O Roluss Intake

Design Parameter	Condition	Remarks
Location:	xxx m upstream from the diversion weir	Left side of the Boribo River
Design Intake Discharge rate:	Q: 5.70 m^3/s	O Roluss Irr.-System A=3,440 ha
Irrigation Water Level WL1:	WL. 38.00m	Top of Gate. Overflow depth=0.2m
Elevation at Inlet (River bed):	EL. 34.00m	
Elevation at Inlet (Intake):	EL. 35.20m	>=35.2 (within upper 0.4 of water depth of the river (referring to Japanese design criteria for headworks))
Gate Sill Elevation:	WL. 35.20m	
Width, Height and Length	Width: 5.7m Height: 4.8m Length: 15.0m (+ Apron length)	Breast wall is installed between EL. 36.7 and EL.39.0 to prevent The entrance of flood water.
Gate Type and Gate Size, nos.	Slide gate, B:2.0 x H:1.5 x 2 nos.	
Bridge	Total width 4.0 m	

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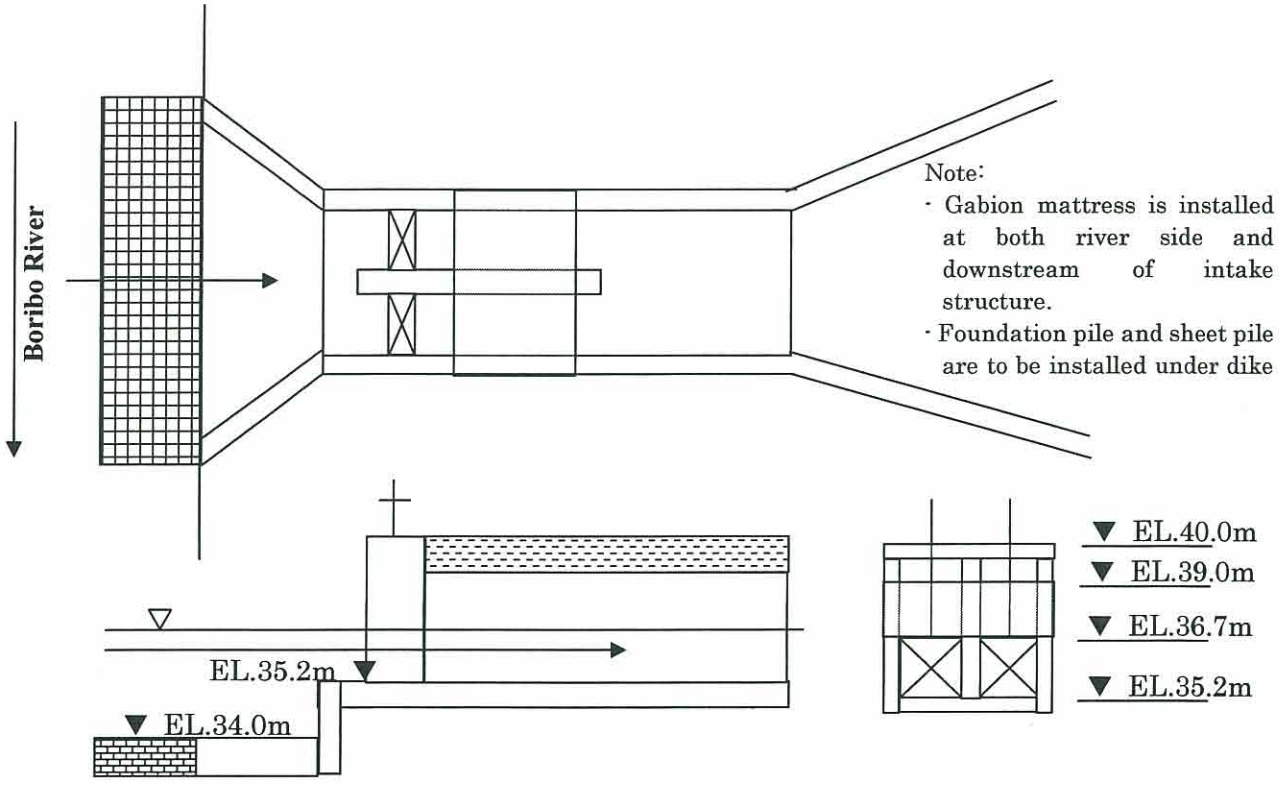

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Figure 5.7-8 Schematic Drawing of O Roluss Intake

Summary for Design of Lum Hach Approach Canal (LHAC)

Design Parameter	Condition	Remarks
Design Discharge rate:	Q1: 6.6 m^3/s	Maximum Intake discharge
Design Temporary Discharge	Q2: 30.3 m^3/s	Max. during Early-Nov. – End. May
Canal bed Inclination	1/ 4,000	Refer to landscape
Canal Base width, top width	B1:15.0 m, B2:23.0 m	Considering economic size
Canal Side Slope, Maning's n coefficient Freeboard	m : 1:2.0 n : 0.025 Fb: 0.8 m	MOWRAM design criteria for Irr. main canal class with Q=5-10m^3/s, sandy soil applied .
Canal Height,	H: 2.0m,	Present condition
Water Depth	h1: 0.79m (Q1=6.6 m^3/s) h2: 1.92m (Q2=30.3 m^3/s) hmax:2.0 m(Qmax=37 m^3/s)	 hmax: Fb=0

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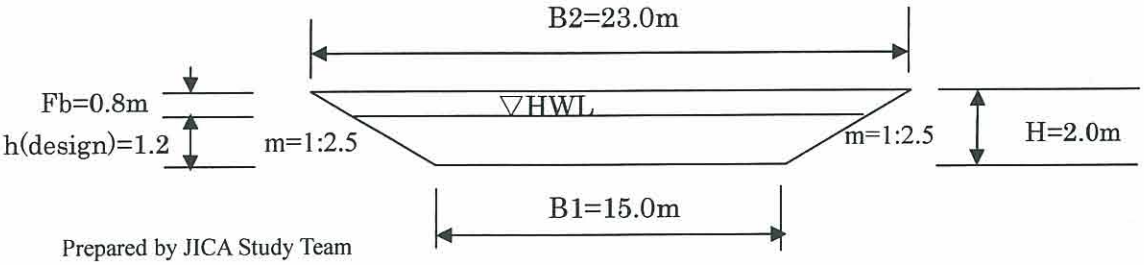

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Figure 5.7-9 Typical Cross Section of Lum Hach Approach Canal

Summary for Design of Closure Dyke for 7th January Canal

Design Parameter		Condition	Remarks
Type of Structure		Concrete Dyke	
Elevation of Dyke	Overflow section	EL1.: 38.0m	> HWL_F1.= 38.00 m
Elevation of Canal Base		EL2.: 36.6m	
Elevation of Dyke Bottom		EL3.: 35.6m	EL2. – 1.0 m
Height of Dyke	Overflow section	H1: 2.4 m (1.4 m)	Apparent height in ( )
Width	Top of Overflow section	B1: 1.5 m	Slope M=1:1.0
	Top of Bottom of section	B2: 3.9m	
Length	Top of Overflow section	L1: 40.0 m	Actual length 34 m + 3.0 x both side
Design Maximum Overflow depth		h : 1.0 m	WL. 39.0 m

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Note:
- Gabion mattress is installed at doth river side and canal side of structure for bed protection.
- Foundation pile are to be installed under dike considering geological

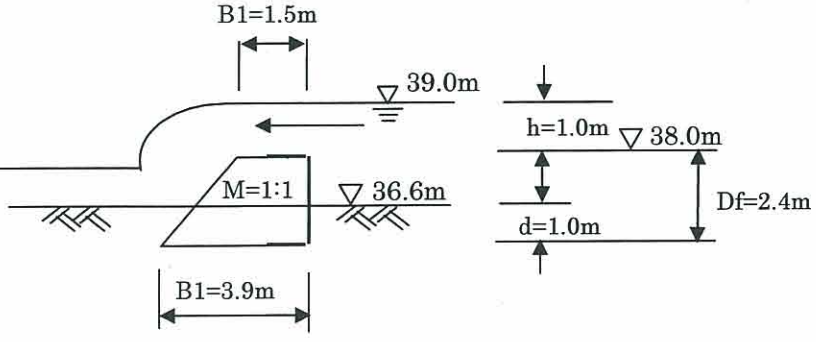

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Figure 5.7-10 Schematic typical section of Closure Dyke for 7th Jan. Canal

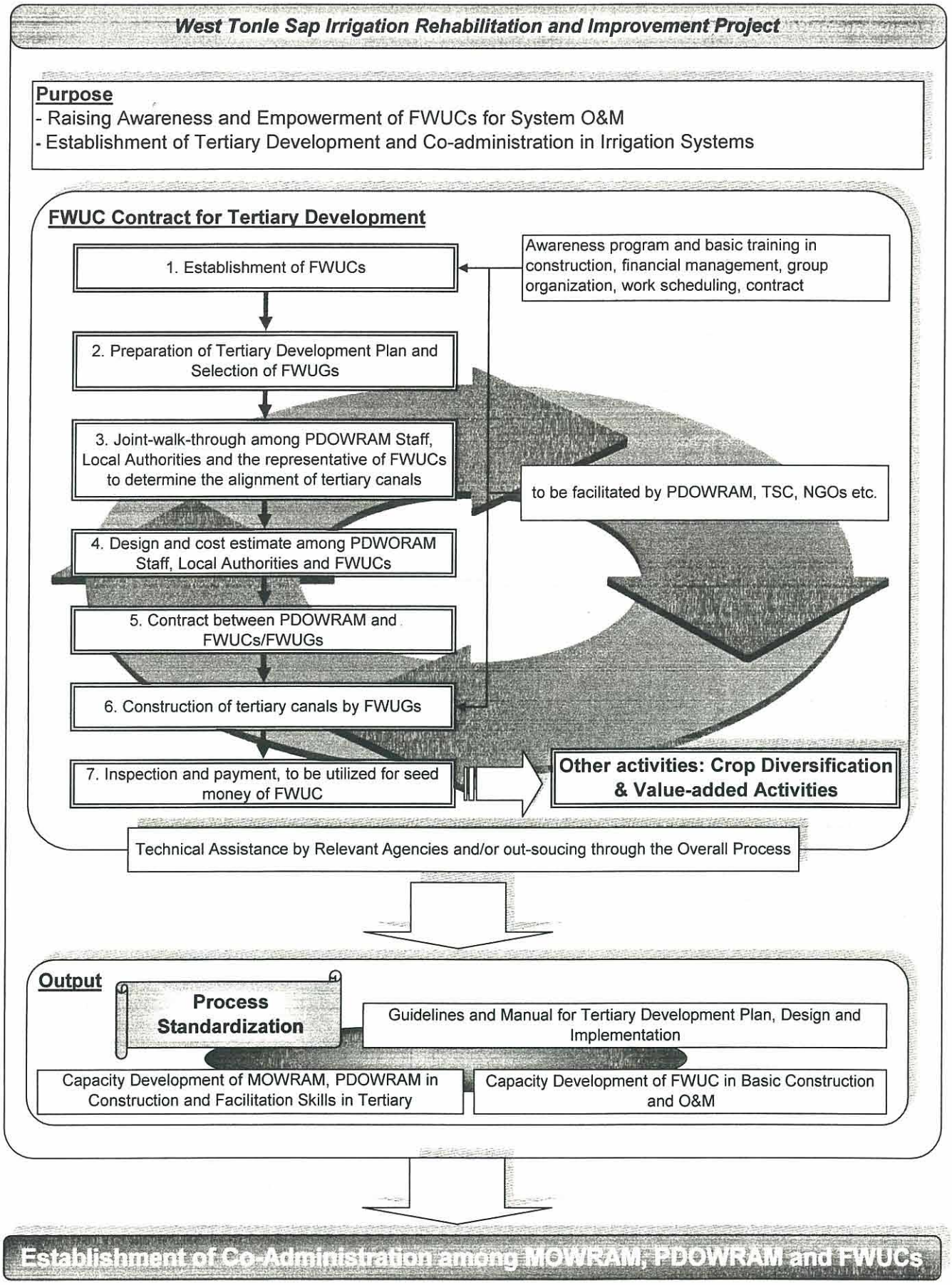

Figure 5.8-1 Participatory Construction of Tertiary Facilities through FWUC Contract Approach

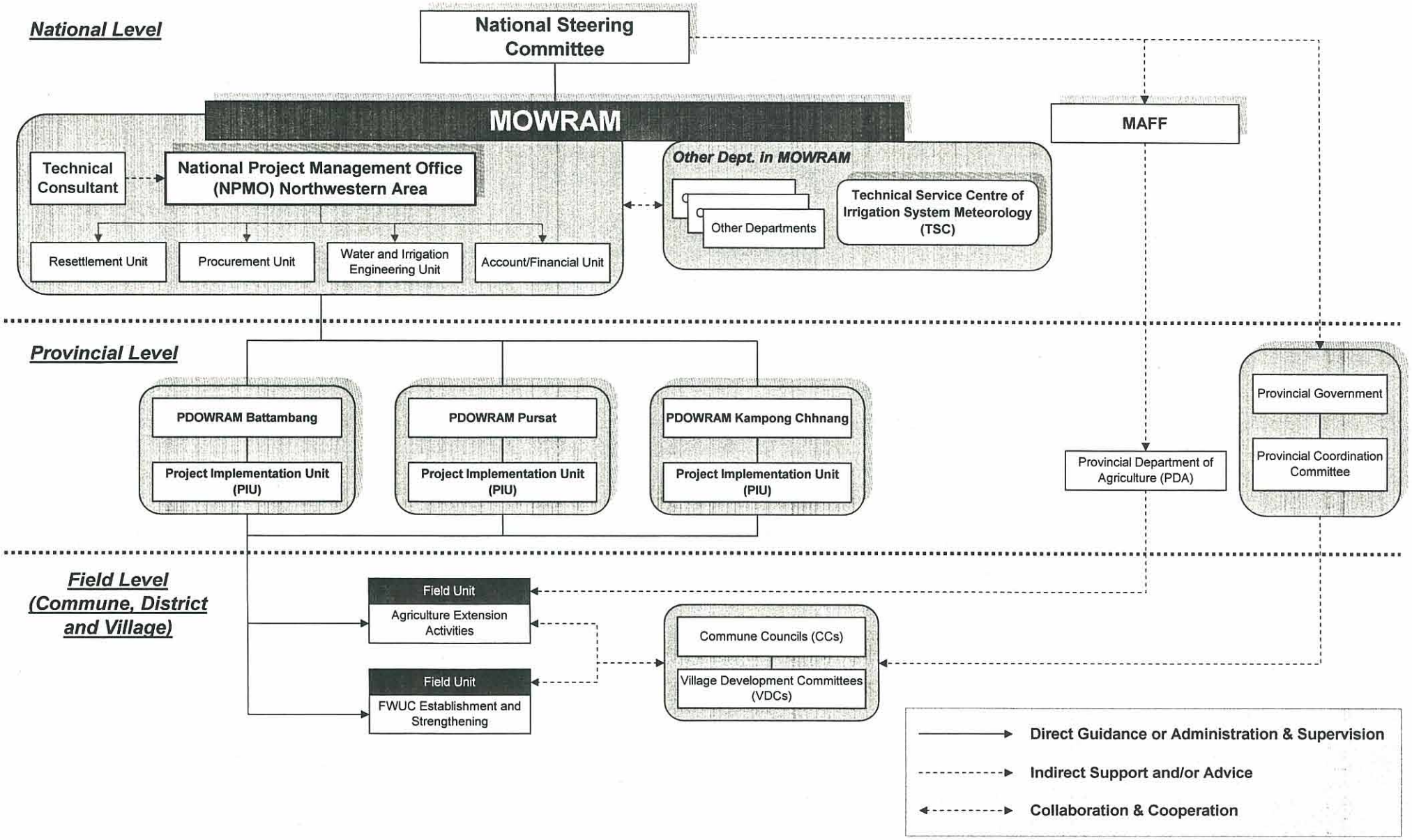

Figure 8.2-1 Project Implementation Organization

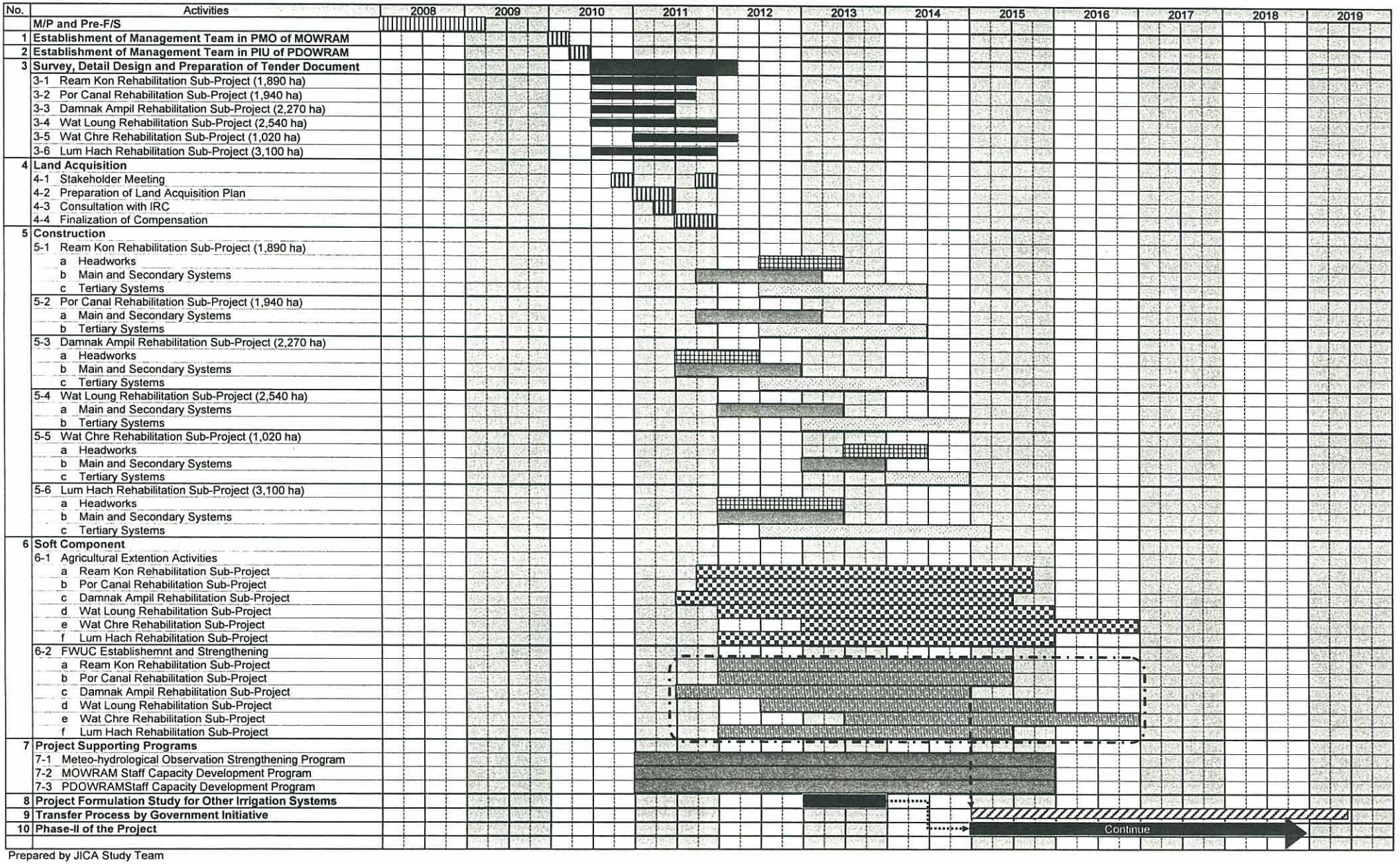

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Figure 8.3.1 Project Implementation Schedule