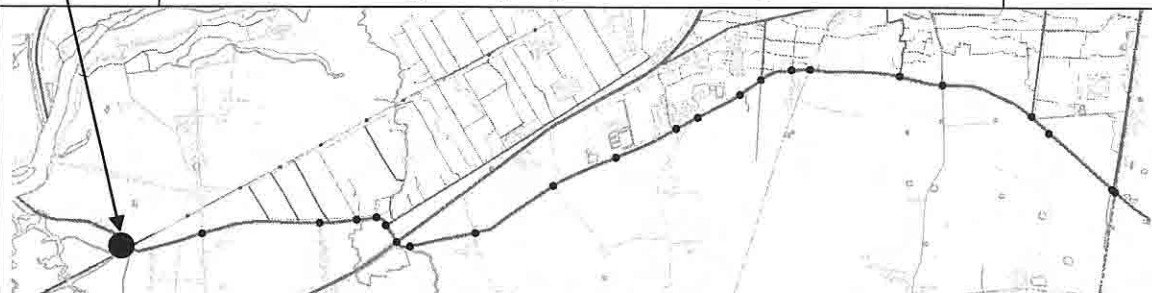



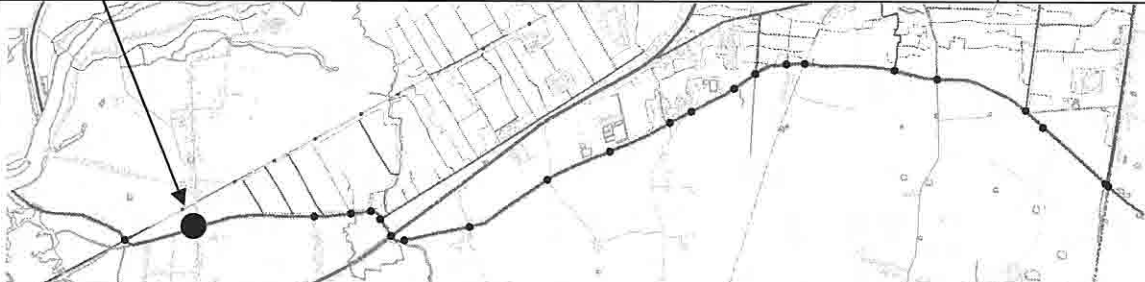


Attachments

Attachments IIIC-1
Inventory of Existing Irrigation Facility
on South Main Canal



Inventory of Existing Irrigation Facilities on the South Main Canal

Serial No.	01				
Type or Name of Structure	Concrete bridge on the headrace			Survey Date	2006/06/19
Location	Coordinates in UTM Indian Thailand grid	North	1263452	East	0440313
	Station No. refer to the Report for Topographic Survey carried out by Khmer Consultant Engineering Corporation Ltd. 30 September 2006				0+985.12
					
Photo-1	view from the upstream			Photo-2	
					
Description of the Structure					
<p>Since axis of the bridge is consistent with a route of power-transmission line, the bridge must be provided for construction and maintenance of the power-transmission line. The elevation of top slab is EL.37.443m; Elevation at bottom is 34.075m.</p>					
Observation					
<p>Height of the bridge road surface is same with the canal bank level. On the survey date, water level at the bridge was 1.6 m lower than the bridge road surface. On the same date, overflow from the Roleang Chrey Regulator gate was estimated at 20cm and it seemed maximum water level. Higher water level than this level make the upstream area of regulator submerged.</p>					
Improvement Plan					
<p>Width of the south approach channel at this bridge is not enough for let design discharge flow. Clearance between water level and top slab is also not enough. It is required to re-construct new concrete bridge with width of 3.5m after demolishing the existing bridge.</p>					

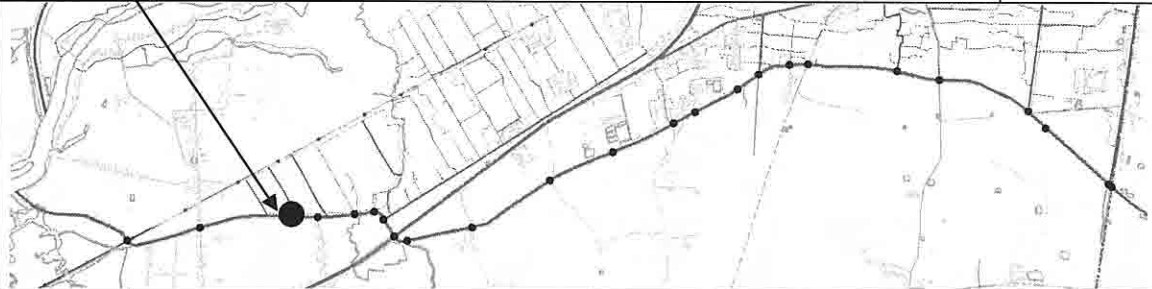

Inventory of Existing Irrigation Facilities on the South Main Canal

Serial No.	02				
Type or Name of Structure	Vatkrouch intake			Survey Date	2006/06/19
Location	Coordinates in UTM Indian Thailand grid	North	1263548	East	0440862
	Station No. refer to the Report for Topographic Survey carried out by Khmer Consultant Engineering Corporation Ltd. 30 September 2006				1+569.255
					
Photo-1	view from the upstream		Photo-2	condition of the radial gate	
					
Description of the Structure					
<p>The Vat Krouch intake was constructed to regulate inflow to the South Main Canal from the Roleang Chrey Regulator.</p>					
Observation					
<p>According to PDOWRAM staff, the gate is working well at present. However, gate wire rope was damaged and repaired with temporary manner.</p> <p>The existing gate with four sealing edges contributes to the head loss at this intake. This is one of the reasons to be difficult to introduce the gravity irrigation.</p>					
Improvement Plan					
<p>The new intake with two gates of 4.0m wide will be re-constructed at same place after demolishing the existing structure.</p>					

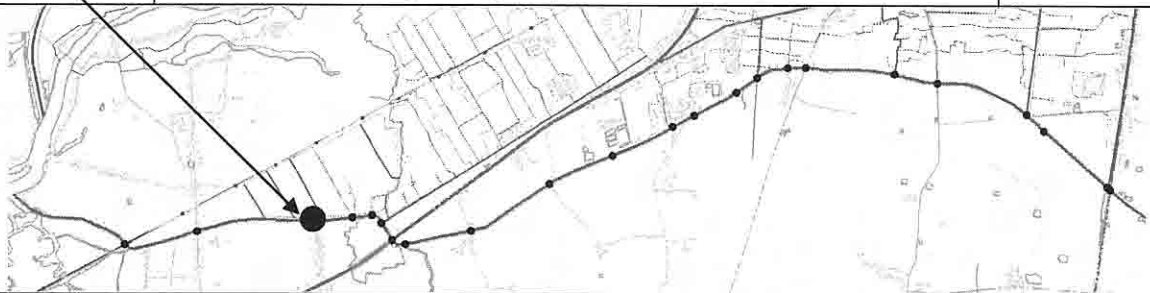


Inventory of Existing Irrigation Facilities on the South Main Canal

Serial No.	03				
Type or Name of Structure	Secondary canal (RS-0) without turnout			Survey Date	2006/06/19
Location	Coordinates in UTM Indian Thailand grid	North	1263666	East	0441381
	Station No. refer to the Report for Topographic Survey carried out by Khmer Consultant Engineering Corporation Ltd. 30 September 2006				2+094.206
					
Photo-1	view from the upstream		Photo-2		
					
Description of the Structure					
The secondary canal (RS-0) was excavated from the South Main Canal to the paddy field.					
Observation					
The secondary canal was not used yet, since no turnout structure was provided.					
Improvement Plan					
The new turnout will be constructed to conduct water to tertiary canal. The existing canal will be rehabilitated by proper way using adequate soil. This canal will be tertiary canal named SMC-T-①.					

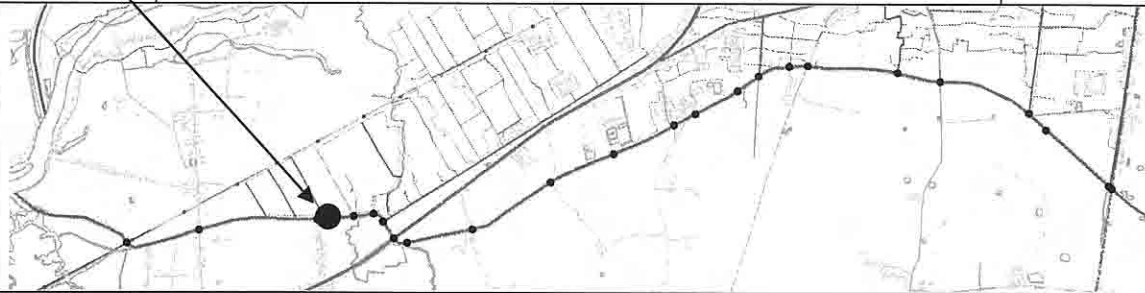

Inventory of Existing Irrigation Facilities on the South Main Canal

Serial No.	04				
Type or Name of Structure	Secondary canal (RS-0.1) without turnout		Survey Date	2006/06/19	
Location	Coordinates in UTM Indian Thailand grid	North	1263638	East	0441626
	Station No. refer to the Report for Topographic Survey carried out by Khmer Consultant Engineering Corporation Ltd. 30 September 2006				N/A
					
Photo-1	view from the upstream		Photo-2		
					
Description of the Structure					
The secondary canal (RS-0.1) was excavated from the South Main Canal to the paddy field.					
Observation					
The secondary canal was not used yet, since no turnout structure was provided.					
Improvement Plan					

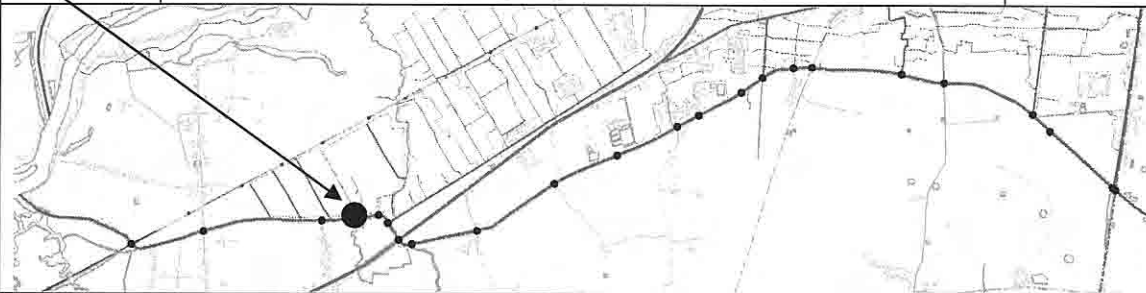
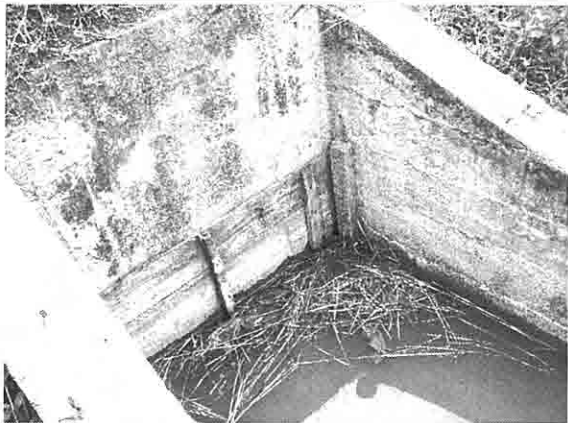

Inventory of Existing Irrigation Facilities on the South Main Canal

Serial No.	05				
Type or Name of Structure	Wooden bridge			Survey Date	2006/06/19
Location	Coordinates in UTM Indian Thailand grid	North	1263643	East	0441796
	Station No. refer to the Report for Topographic Survey carried out by Khmer Consultant Engineering Corporation Ltd. 30 September 2006				2+484.633
					
Photo-1	view from the upstream		Photo-2	short-distance view	
					
Description of the Structure					
The bridge was provided by Ou Veaeng village people by their own effort to go across the South Main Canal to the irrigation area.					
Observation					
Height of the bridge is same as the canal bank level. It is dangerous to go across the bridge.					
Improvement Plan					
The concrete foot path with effective width of 2.2m will be constructed with canal protection by concrete lining at upstream and downstream of 5m each. The foot path should have a clearance of 1.0m above design water level.					

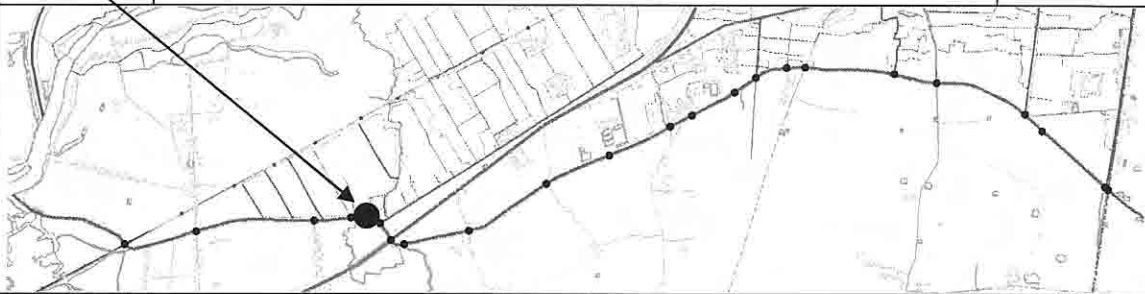


Inventory of Existing Irrigation Facilities on the South Main Canal

Serial No.	06				
Type or Name of Structure	Secondary canal (RS-1) without turnout			Survey Date	2006/06/19
Location	Coordinates in UTM Indian Thailand grid	North	1263646	East	0441839
	Station No. refer to the Report for Topographic Survey carried out by Khmer Consultant Engineering Corporation Ltd. 30 September 2006				N/A
					
Photo-1	view from the upstream			Photo-2	
					
Description of the Structure					
The secondary canal (RS-1) was excavated from the South Main Canal to the paddy field.					
Observation					
The secondary canal was not used yet, since no turnout structure was provided.					
Improvement Plan					




Inventory of Existing Irrigation Facilities on the South Main Canal

Serial No.	07				
Type or Name of Structure	Turnout structure for former irrigation canal		Survey Date	2006/06/19	
Location	Coordinates in UTM Indian Thailand grid	North	1263653	East	0442062
	Station No. refer to the Report for Topographic Survey carried out by Khmer Consultant Engineering Corporation Ltd. 30 September 2006				2+790
					
Photo-1	view from the main canal		Photo-2	view from the upstream	
					
Description of the Structure					
<p>According to PDOWRAM staff, the turnout structure was used before. However, it is not used any more. The concrete pipe with diameter of 0.8m is installed.</p>					
Observation					
Improvement Plan					
<p>The new turnout with a concrete pipe with diameter of 0.5m will be constructed after demolishing of existing structure. The existing canal will be rehabilitated by proper soil, and is used as tertiary canal named SMC-T-②.</p>					

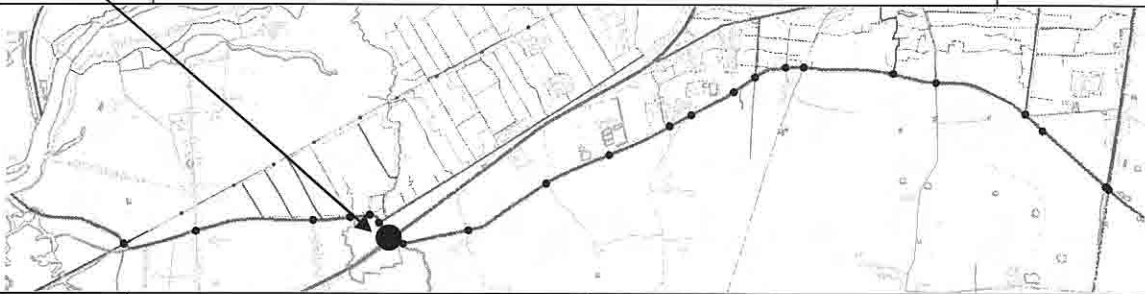

Inventory of Existing Irrigation Facilities on the South Main Canal

Serial No.	08				
Type or Name of Structure	North spillway of Ou Veang regulating pond		Survey Date	2006/06/19	
Location	Coordinates in UTM Indian Thailand grid	North	1263684	East	0442205
	Station No. refer to the Report for Topographic Survey carried out by Khmer Consultant Engineering Corporation Ltd. 30 September 2006				2+929.702
					
Photo-1	upstream of the spillway (end of the right bank)	Photo-2	view of the spillway		
					
Description of the Structure					
<p>According to MOWRAM and PDOWRAM staff, before construction of the South Main Canal, a labyrinth type spillway was provided to spill out flood water from the Ou Veang pond. However, it was not used after the main canal construction.</p>					
Observation					
<p>Height of the spillway crest is about at 35.28m. (About 1 meter lower than left bank elevation).</p>					
Improvement Plan					
<p>The design water level at this spillway is 35.44m. The crest of spillway should be heightened about 20cm.</p>					

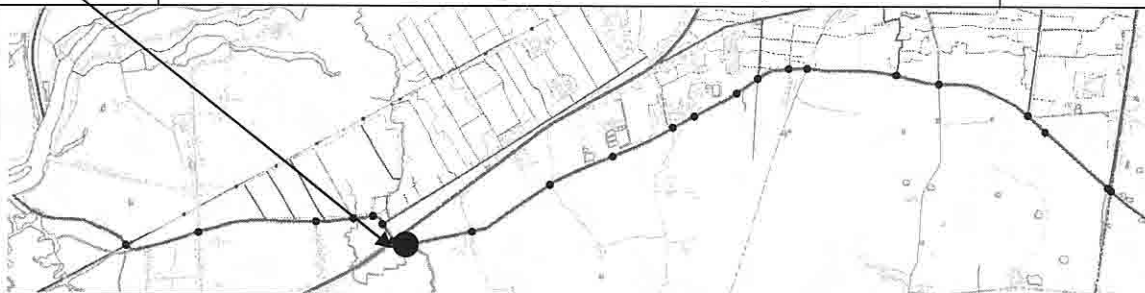


Inventory of Existing Irrigation Facilities on the South Main Canal

Serial No.	09				
Type or Name of Structure	Turnout to secondary canal (RS-3)			Survey Date	2006/06/25
Location	Coordinates in UTM Indian Thailand grid	North	1263619	East	0442294
	Station No. refer to the Report for Topographic Survey carried out by Khmer Consultant Engineering Corporation Ltd. 30 September 2006				3+025.000
					
Photo-1	view from the Ou Veang pond		Photo-2	secondary canal (RS-3)	
					
Description of the Structure					
Turnout structure with two slide gates (size: 1.0m width x 1.6m height x 2 nos.) was provided to divert water from the South Main Canal to the secondary canal No. RS-3.					
Observation					
It was observed that upstream gate is always closed and inflow to the secondary canal is regulated by the downstream gate. The bed elevation of gate is 33.59m.					
Improvement Plan					
The height of existing gate is not enough to design water level. The new gate with 1.0m width and 1.85m height will be installed. The existing canal will be rehabilitated with proper way, and is used for secondary canal named SMC-S-1.					

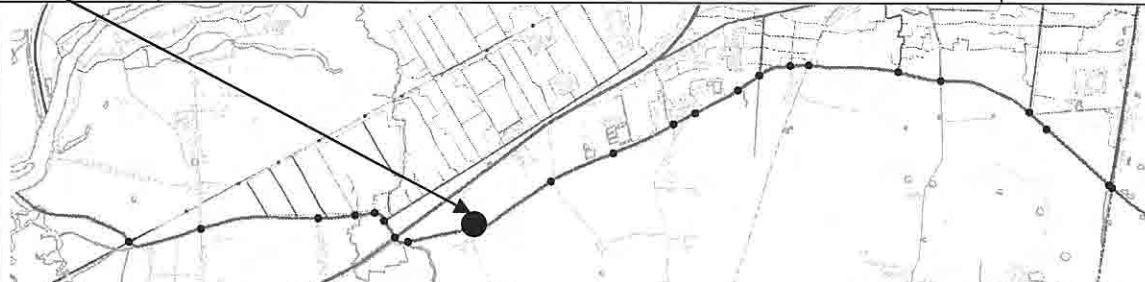


Inventory of Existing Irrigation Facilities on the South Main Canal

Serial No.	10				
Type or Name of Structure	Road crossing on the Ou Veang regulating pond		Survey Date	2006/06/19	
Location	Coordinates in UTM Indian Thailand grid	North	1263474	East	0442375
	Station No. refer to the Report for Topographic Survey carried out by Khmer Consultant Engineering Corporation Ltd. 30 September 2006				3+181.965
					
Photo-1	view from the downstream		Photo-2		
					
Description of the Structure					
The road crossing culvert with 3 m in width and 2 m in depth (according to PDOWRAM staff) was provided at the crossing point of the South Main Canal with national road No. 4.					
Observation					
The size of existing box culvert is too small for design discharge.					
Improvement Plan					
The new box culvert will be constructed along the existing one.					

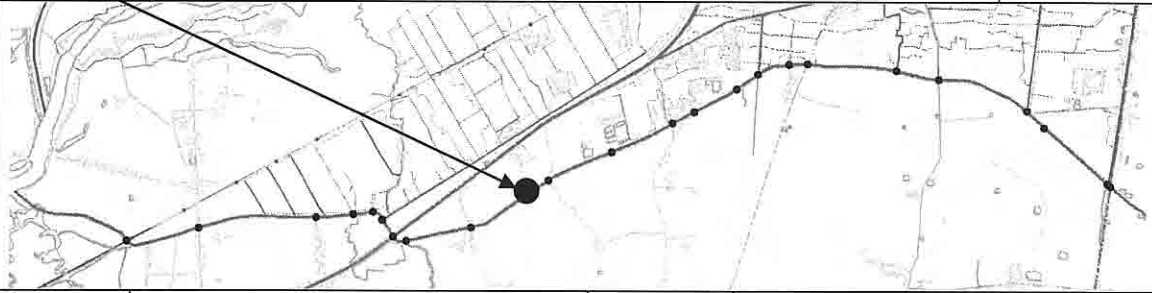

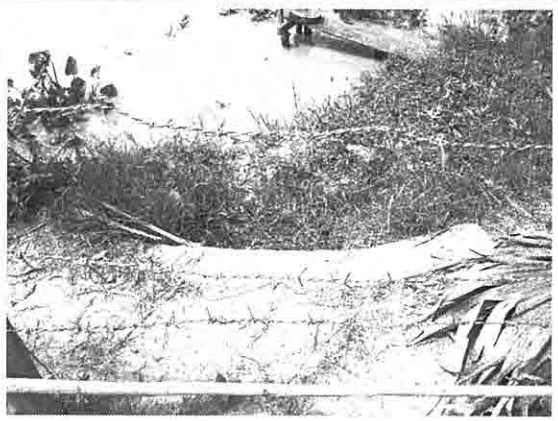
Inventory of Existing Irrigation Facilities on the South Main Canal

Serial No.	11				
Type or Name of Structure	South spillway of Ou Veang regulating pond		Survey Date	2006/06/25	
Location	Coordinates in UTM Indian Thailand grid	North	1263453	East	0442456
	Station No. refer to the Report for Topographic Survey carried out by Khmer Consultant Engineering Corporation Ltd. 30 September 2006				3+293.112
					
Photo-1	overview		Photo-2	Gate of the spillway	
					
Description of the Structure					
<p>According to MOWRAM and PDOWRAM staff, before construction of the South Main Canal, a gate type spill way (size: 1.6m width x 1.2m height x 1 nos.) was provided at the downstream end of the Ou Veang pond to spill out the flood water from the pond. However, it was not used after the main canal construction.</p>					
Observation					
Improvement Plan					
Existing structure will be used without rehabilitation.					

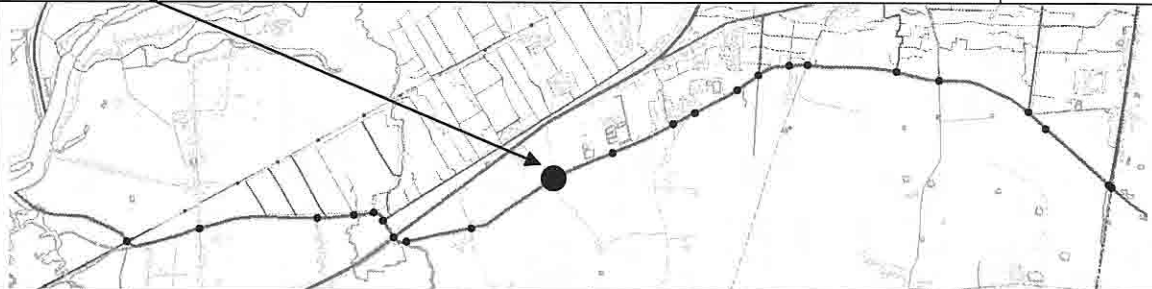


Inventory of Existing Irrigation Facilities on the South Main Canal

Serial No.	12				
Type or Name of Structure	Wooden bridge			Survey Date	2006/06/25
Location	Coordinates in UTM Indian Thailand grid	North	1263571	East	0442969
	Station No. refer to the Report for Topographic Survey carried out by Khmer Consultant Engineering Corporation Ltd. 30 September 2006				3+820.517
					
Photo-1	view from the upstream		Photo-2		
					
Description of the Structure					
Wooden bridge was provided by villagers to connect village road from the south with the village road from the north.					
Observation					
Height of the bridge is same as the canal bank level. It is dangerous to go across the bridge.					
Improvement Plan					
The concrete Bridge with effective width of 3.5m will be constructed with canal protection by concrete lining at upstream and downstream of 5m each after demolishing of existing wooden bridge. The concrete bridge should have a clearance of 1.0m above design water level.					

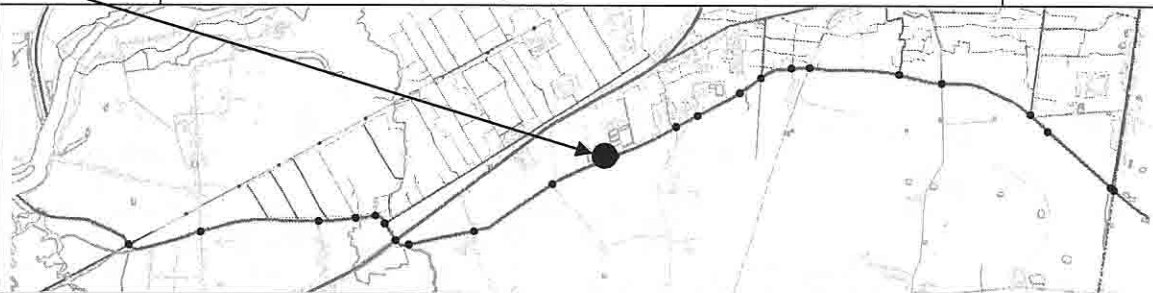

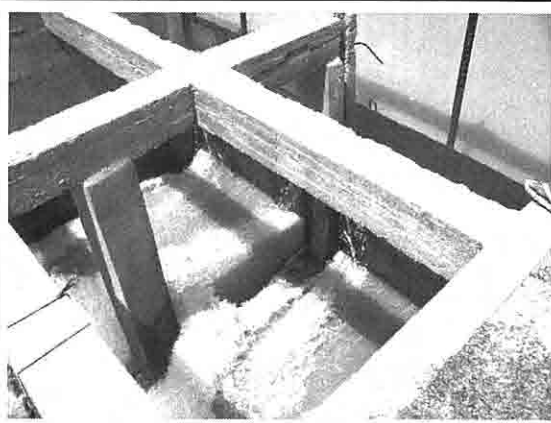
Inventory of Existing Irrigation Facilities on the South Main Canal

Serial No.	13				
Type or Name of Structure	Drain inlet			Survey Date	2006/06/25
Location	Coordinates in UTM Indian Thailand grid	North	1263555	East	0443012
	Station No. refer to the Report for Topographic Survey carried out by Khmer Consultant Engineering Corporation Ltd. 30 September 2006				3+920
					
Photo-1	view from the upstream		Photo-2	view of the inlet	
					
Description of the Structure					
<p>Drain inlet structure was provided on the right bank of the South Main Canal to drain unnecessary water from the paddy field to the canal.</p>					
Observation					
<p>The structure is not functioning since the inlet part was clogged up by siltation. The canal slope around outlet has eroded heavily.</p>					
Improvement Plan					
<p>The small rehabilitation with canal slope protection such as masonry works will be done.</p>					

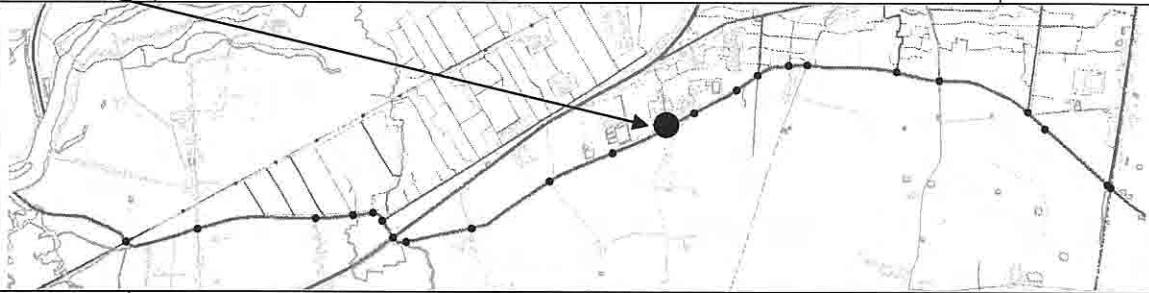


Inventory of Existing Irrigation Facilities on the South Main Canal

Serial No.	14				
Type or Name of Structure	Plate girder bridge			Survey Date	2006/06/25
Location	Coordinates in UTM Indian Thailand grid	North	1263937	East	0443566
	Station No. refer to the Report for Topographic Survey carried out by Khmer Consultant Engineering Corporation Ltd. 30 September 2006				4+533.055
					
Photo-1	view from the upstream		Photo-2	view from the left bank	
					
Description of the Structure					
The bridge was provided to connect Bos Ta Ney village located the left bank of the South Main Canal to the right bank of the canal.					
Observation					
Height of the bridge is same as the canal bank level. It is dangerous to go across the bridge.					
Improvement Plan					
The concrete Bridge with effective width of 3.5m will be constructed with canal protection by concrete lining at upstream and downstream of 5m each after demolishing of existing bridge. The concrete bridge should have a clearance of 1.0m above design water level.					

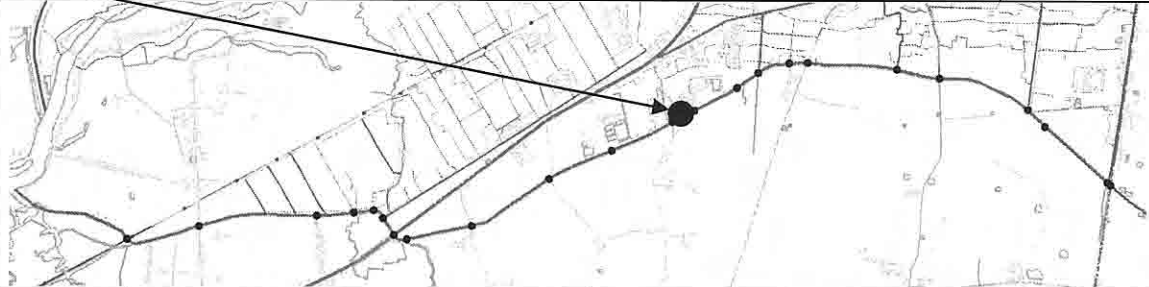


Inventory of Existing Irrigation Facilities on the South Main Canal

Serial No.	15				
Type or Name of Structure	Check structure and turnout			Survey Date	2006/06/25
Location	Coordinates in UTM Indian Thailand grid	North	1264144	East	0444063
	Station No. refer to the Report for Topographic Survey carried out by Khmer Consultant Engineering Corporation Ltd. 30 September 2006				5+067.473
					
Photo-1	view from the upstream		Photo-2	view from the downstream	
					
Description of the Structure					
<p>The check structure was provided by owner of the pig raising farm located right bank of the South Main Canal. Two numbers of steel gates of which sizes 1.8m width x 1.7m height are provided. A turnout for pig raising farm was also provided on the left bank.</p>					
Observation					
<p>The side slope at downstream has eroded heavily.</p>					
Improvement Plan					
<p>To be removed. The side slope at both upstream and downstream should be rehabilitated by embankment using clayey soil.</p>					

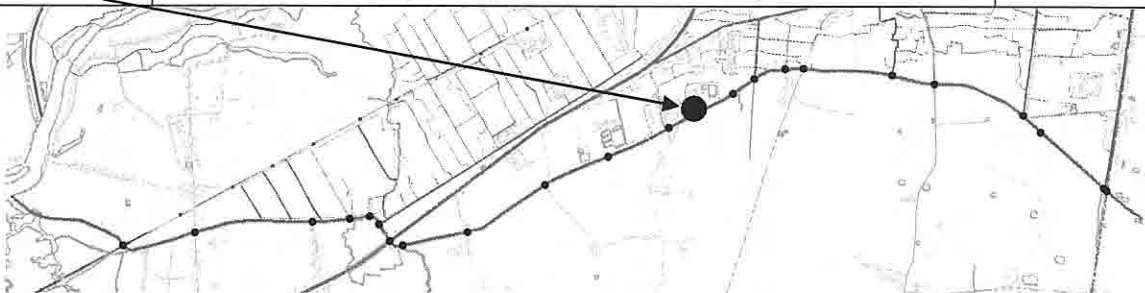

Inventory of Existing Irrigation Facilities on the South Main Canal

Serial No.	16				
Type or Name of Structure	Secondary canal (RS-5) without turnout			Survey Date	2006/06/26
Location	Coordinates in UTM Indian Thailand grid	North	1264361	East	0444493
	Station No. refer to the Report for Topographic Survey carried out by Khmer Consultant Engineering Corporation Ltd. 30 September 2006				N/A
					
Photo-1	view from the main canal		Photo-2	downstream view	
					
Description of the Structure					
Observation					
Improvement Plan					

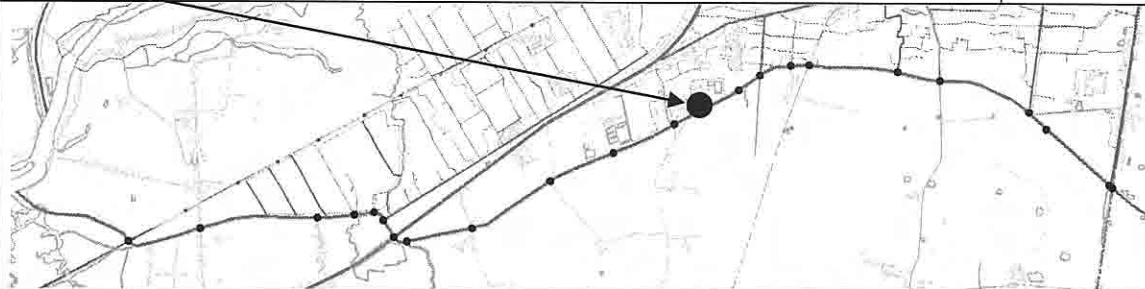


Inventory of Existing Irrigation Facilities on the South Main Canal

Serial No.	17				
Type or Name of Structure	Wooden bridge			Survey Date	2006/06/25
Location	Coordinates in UTM Indian Thailand grid	North	1264373	East	0444520
	Station No. refer to the Report for Topographic Survey carried out by Khmer Consultant Engineering Corporation Ltd. 30 September 2006				5+584.205
					
Photo-1	view from the upstream		Photo-2	view from the left bank	
					
Description of the Structure					
The wooden bridge is supported by concrete column.					
Observation					
Height of the bridge is same as the canal bank level. It is dangerous to go across the bridge.					
Improvement Plan					
The concrete Bridge with effective width of 3.5m will be constructed with canal protection by concrete lining at upstream and downstream of 5m each after demolishing of existing wooden bridge. The concrete bridge should have a clearance of 1.0m above design water level.					

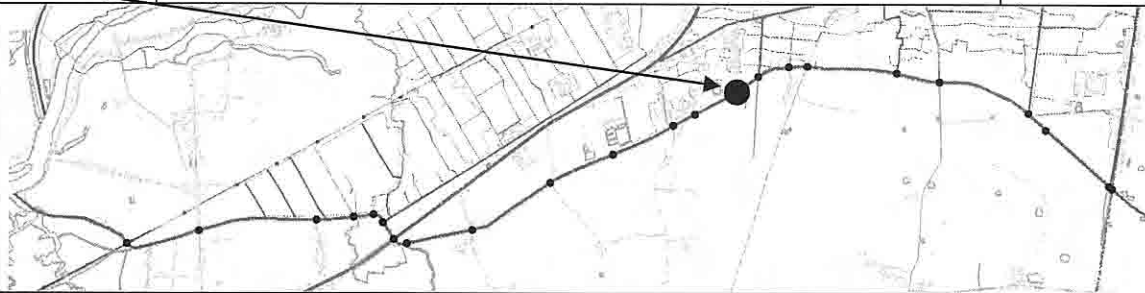

Inventory of Existing Irrigation Facilities on the South Main Canal

Serial No.	18				
Type or Name of Structure	Wooden bridge			Survey Date	2006/06/25
Location	Coordinates in UTM Indian Thailand grid	North	1264464	East	0444686
	Station No. refer to the Report for Topographic Survey carried out by Khmer Consultant Engineering Corporation Ltd. 30 September 2006				5+778.572
					
Photo-1	view from the left bank		Photo-2		
					
Description of the Structure					
Observation					
<p>Height of the bridge is same as the canal bank level. The side slope at downstream has eroded heavily. It is dangerous to go across the bridge.</p>					
Improvement Plan					
<p>The concrete foot path with effective width of 2.2m will be constructed with canal protection by concrete lining at both upstream and downstream of 5m each. The foot path should have a clearance of 1.0m above design water level.</p>					

Inventory of Existing Irrigation Facilities on the South Main Canal

Serial No.	19				
Type or Name of Structure	Wooden bridge			Survey Date	2006/06/25
Location	Coordinates in UTM Indian Thailand grid	North	1264644	East	0445017
	Station No. refer to the Report for Topographic Survey carried out by Khmer Consultant Engineering Corporation Ltd. 30 September 2006				6+142.765
					
Photo-1	view from the downstream		Photo-2	view of the left bank village road	
					
Description of the Structure					
Observation					
<p>Height of the bridge is same as the canal bank level. The side slope at both upstream and downstream has eroded heavily.</p> <p>It is dangerous to go across the bridge.</p>					
Improvement Plan					
<p>The check structure with three gates of which sizes 2.0m wide x 3.2m height and two overflow weir will be constructed at this place to regulate water. The concrete foot path will be constructed also on check structure.</p>					

Inventory of Existing Irrigation Facilities on the South Main Canal

Serial No.	20				
Type or Name of Structure	Drain inlet			Survey Date	2006/06/25
Location	Coordinates in UTM Indian Thailand grid	North	1264679	East	0445082
	Station No. refer to the Report for Topographic Survey carried out by Khmer Consultant Engineering Corporation Ltd. 30 September 2006				6+200
					
Photo-1	view from the left bank			Photo-2	
					
Description of the Structure					
Drain inlet structure was provided on the right bank of the South Main Canal to drain unnecessary water from the small stream to the canal.					
Observation					
The side slope of main canal around outlet has eroded heavily.					
Improvement Plan					
New drainage inlet with concrete pipe will be constructed. The canal slope protection will be also constructed.					