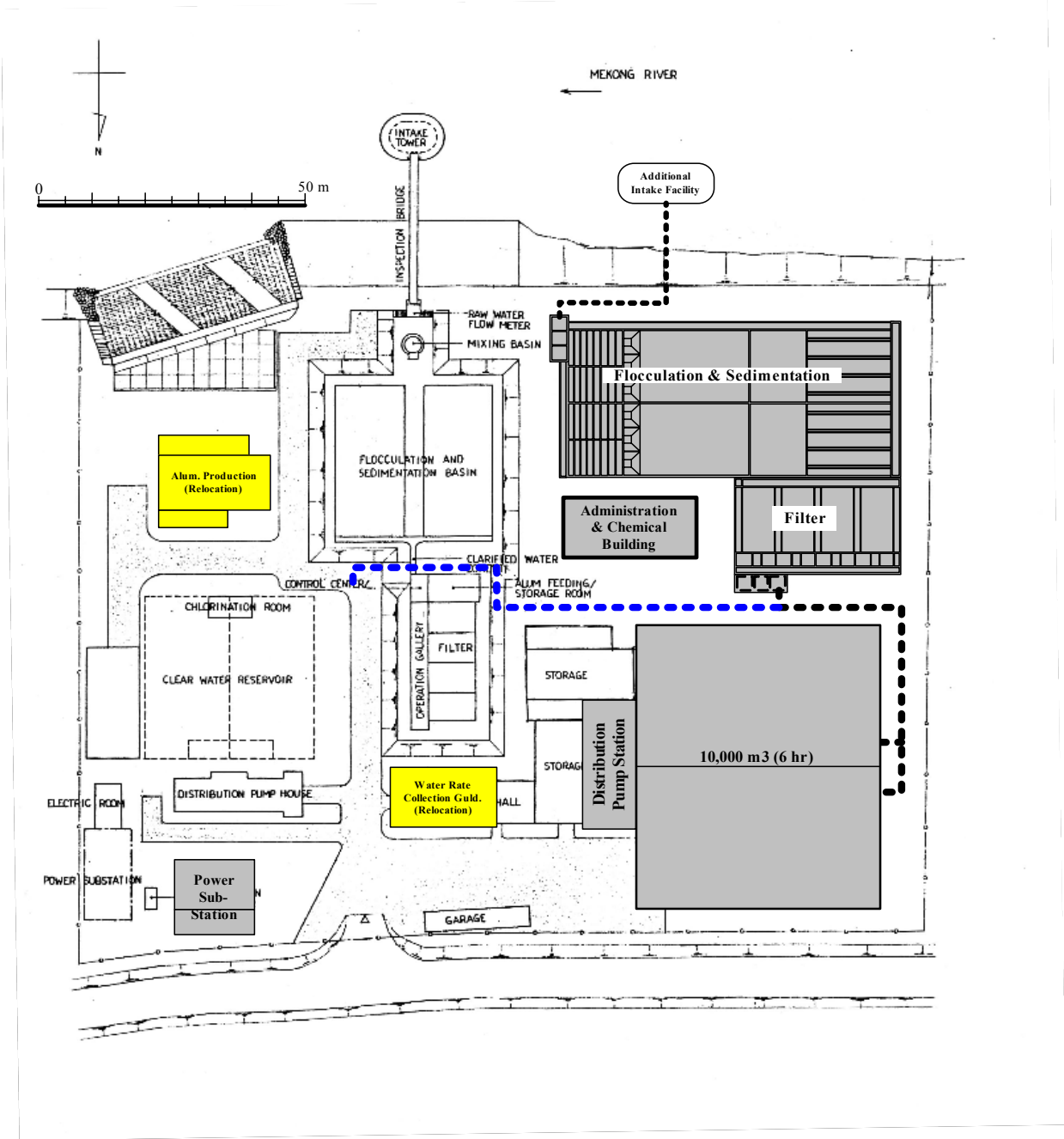
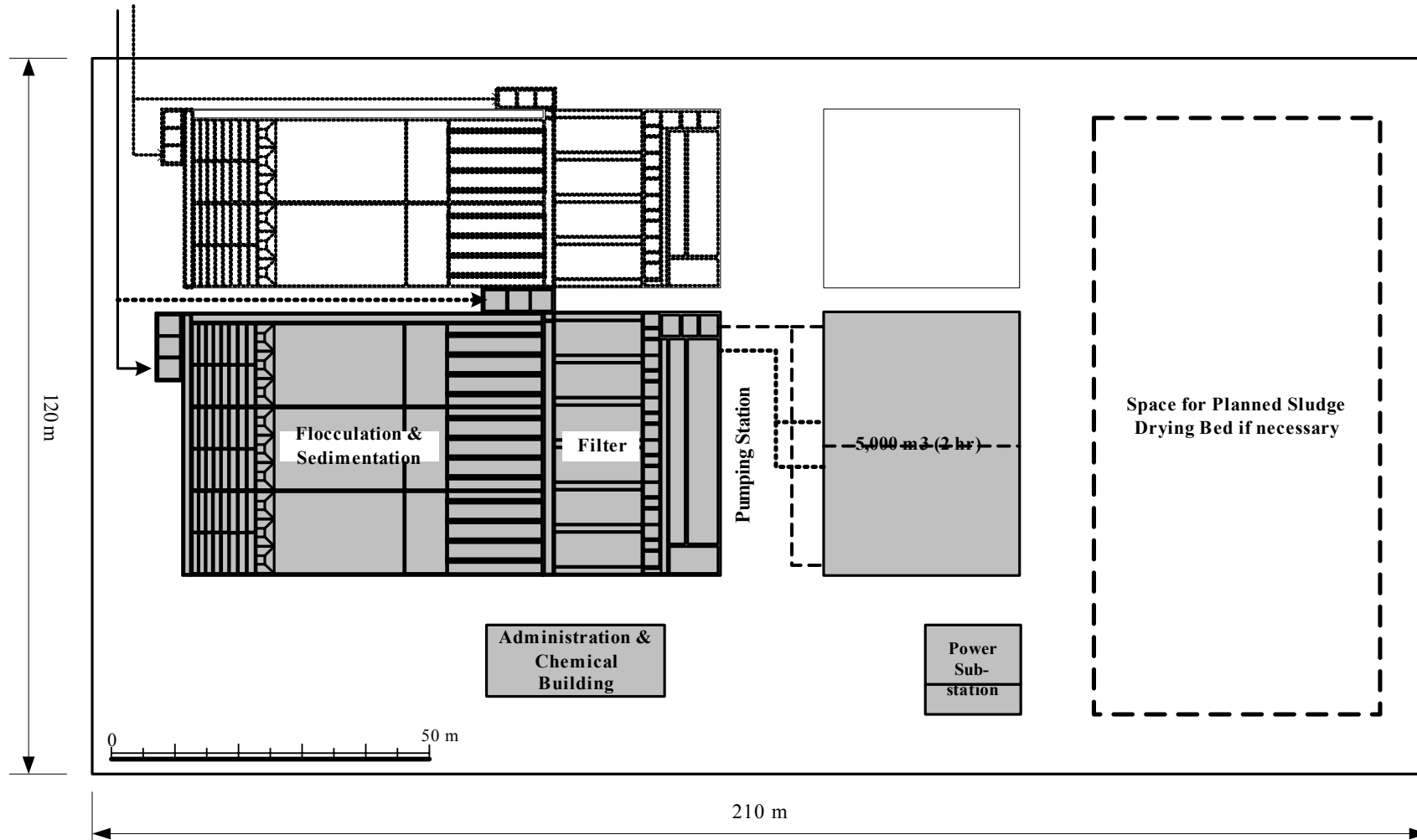


4. ALTERNATIVE K-1

General Plan of Kaolieo Treatment Plant Expansion: 40,000 m³/day



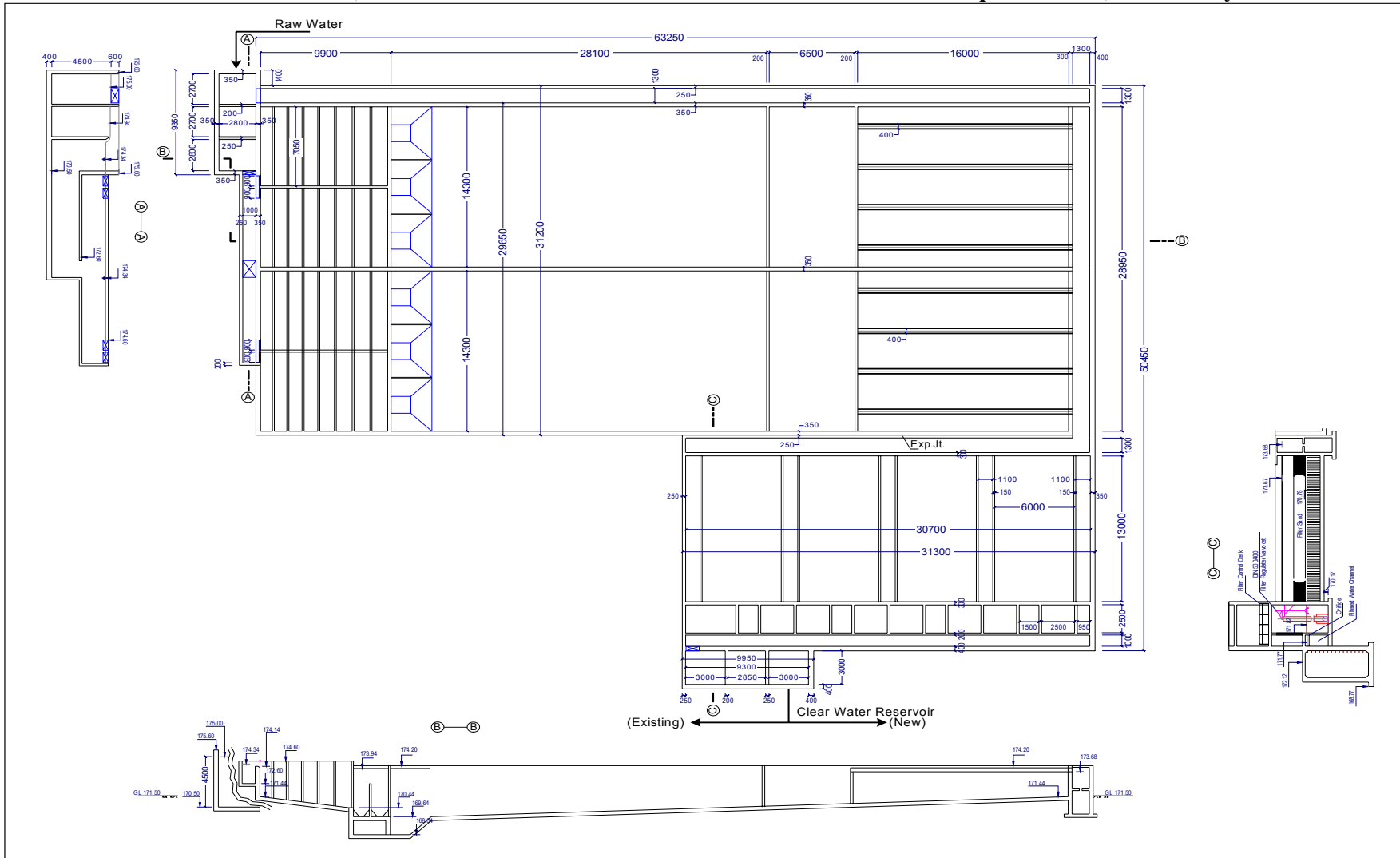
General Plan of Thangone Treatment Plant Construction: 60,000 m³/day



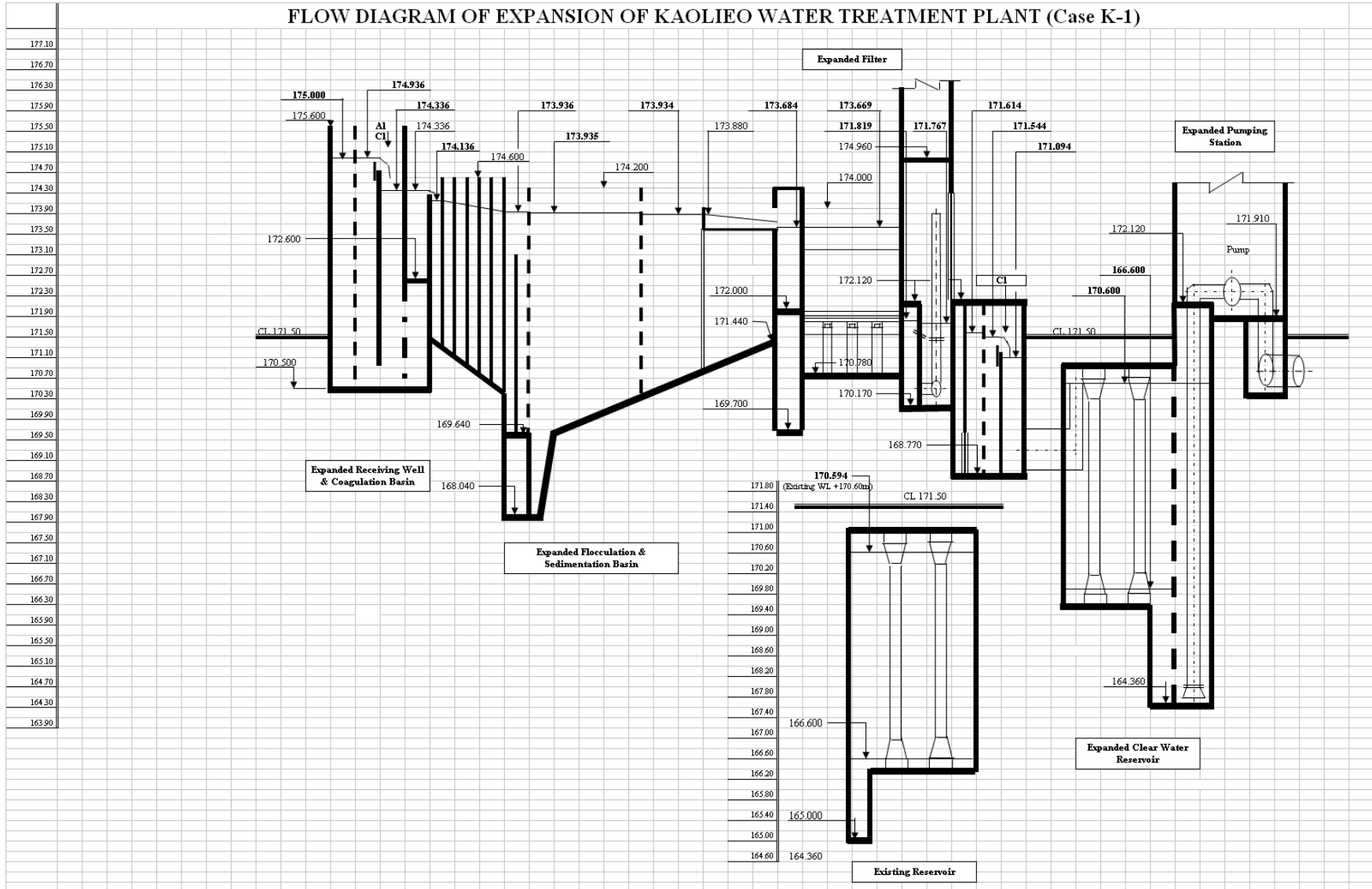
Case K-1
Expansion of Construction of New Treatment Plants

1st Stage		Expansion of 40,000 m3/day		2nd Stage		Construction of 60,000 m3/day	
Planned Components of Expansion of Kaolieo Treatment Plant				Planned Components of Construction of Thangene Treatment Plant			
Intake Facility	Intake Structure	Construction of New Intake		Intake Facility	Intake Structure	Construction of New Intake	
	Intake Pump	15.3 m3/min ×65 kW×3 Units			Intake Pump	15.3 m3/min ×140 kW×4 Units	
Raw Water Transmission Pipe		D700 mm×L40 m, Ultrasonic Flow Meter		Raw Water Transmission Pipe		D900 mm×L530 m, Ultrasonic Flow Meter	
Receiving Well & Mixing Well	Receiving Well!	1 Basin, D.T.=2.3 min.		Receiving Well & Mixing Well (Same Size for Direct Filtration)	Receiving Well	1 Basin (1 Basin), D.T.=2.4 min.	
	Mixing Well	1 Basin, D.T.=1.0 min.			Mixing Well	1 Basin (1 Basin), D.T.=1.0 min.	
Flocculation & Sedimentation Basin	Flocculation Basin	Up and Down Flow Baffle Channel 2 Units/Basin×2 Basins, D.T.=28.3 min.		Flocculation & Sedimentation Basin	Flocculation Basin	Up and Down Flow Baffle Channel 2 Units/Basin×3 Basins, D.T.=27.1 min.	
	Sedimentation Basin	Horizontal Flow /w Launder Trough, 2 Basins D.T.=2.40 hr, Ave.Velocity=0.36 m/min.			Sedimentation Basin	Horizontal Flow /w Launder Trough, 3 Basins D.T.=2.00 hr, Ave.Velocity=0.37 m/min.	
Filtration Facility	Filter Basin	A=78.0 m2×4 Basins, V=141 m/d		Filtration Facility	Filter Basin	A=78.1 m2×6 Basins, V=141 m/d	
	Filter Washing Equipment	B.W.P.: 47.0m3/min×70kW×2 Units A.B.P.: 94.6m3/min×90kW×2 Units			Filter Washing Equipment	B.W.P.: 47.0m3/min×70kW×2 Units A.B.P.: 94.6m3/min×90kW×2 Units	
Filtered Water Measurement & Chlorine Mixing Chamber	Measurement Chamber	1 Basin, D.T.=1.8 min.		Filtered Water Measurement & Chlorine Mixing Chamber	Measurement Chamber	1 Basin, D.T.=1.8 min.	
	Mixing Chamber	1 Basin, D.T.=0.7 min.			Mixing Chamber	1 Basin, D.T.=0.7 min.	
Clear Water Reservoir	Clear Water Reservoir	V=10,000 m3		Clear Water Reservoir	Clear Water Reservoir	V=5,000 m3	
	Piping	D700mm, D600mm			Piping	D900mm	
Distribution Pumping Facility	Distribution Pump Building	A=250 m2		Transmission Pumping Facility	Transmission Pump Building	A=320 m2	
	Distribution Pump	12.1 m3/min ×67m×195 kW×4 Units			Transmission Pump	10.5 m3/min ×42.5m×110 kW×5 Units	
Chemical Feeding Facility	Chemical Feeding Equipment	Installation of Equipment and Solution Tank		Chemical Feeding Facility	Chemical Feeding Equipment	Installation of Equipment and Solution Tank	
	Chemical Building	In preparation for Administration Building			Chemical Building	In preparation for Administration Building	
Electrical Equipment Facility	Power Receiving Facility	Power Receiving and Transformer Equip.		Electrical Equipment Facility	Power Receiving Facility	Power Receiving and Transformer Equip.	
	Power Supply Facility	Power Supply Equipment			Power Supply Facility	Power Supply Equipment	
	Emergency Generator	Generator Cap. for 1/3of Dis. Pump Cap.			Emergency Generator	Generator Cap. for 1/3 of Tran. Pump Cap.	
	Instrumentation Equipment	Monitoring, Supervising and Controlling			Instrumentation Equipment	Monitoring, Supervising and Controlling	
Administration Building		A=300m2×2F		Administration Building		A=300m2×2F,	
Laboratory		In preparation for Administration Building		Laboratory		In preparation for Administration Building	
Landscaping and Others		Including demolition & relocation of existing housings		Landscaping and Others			

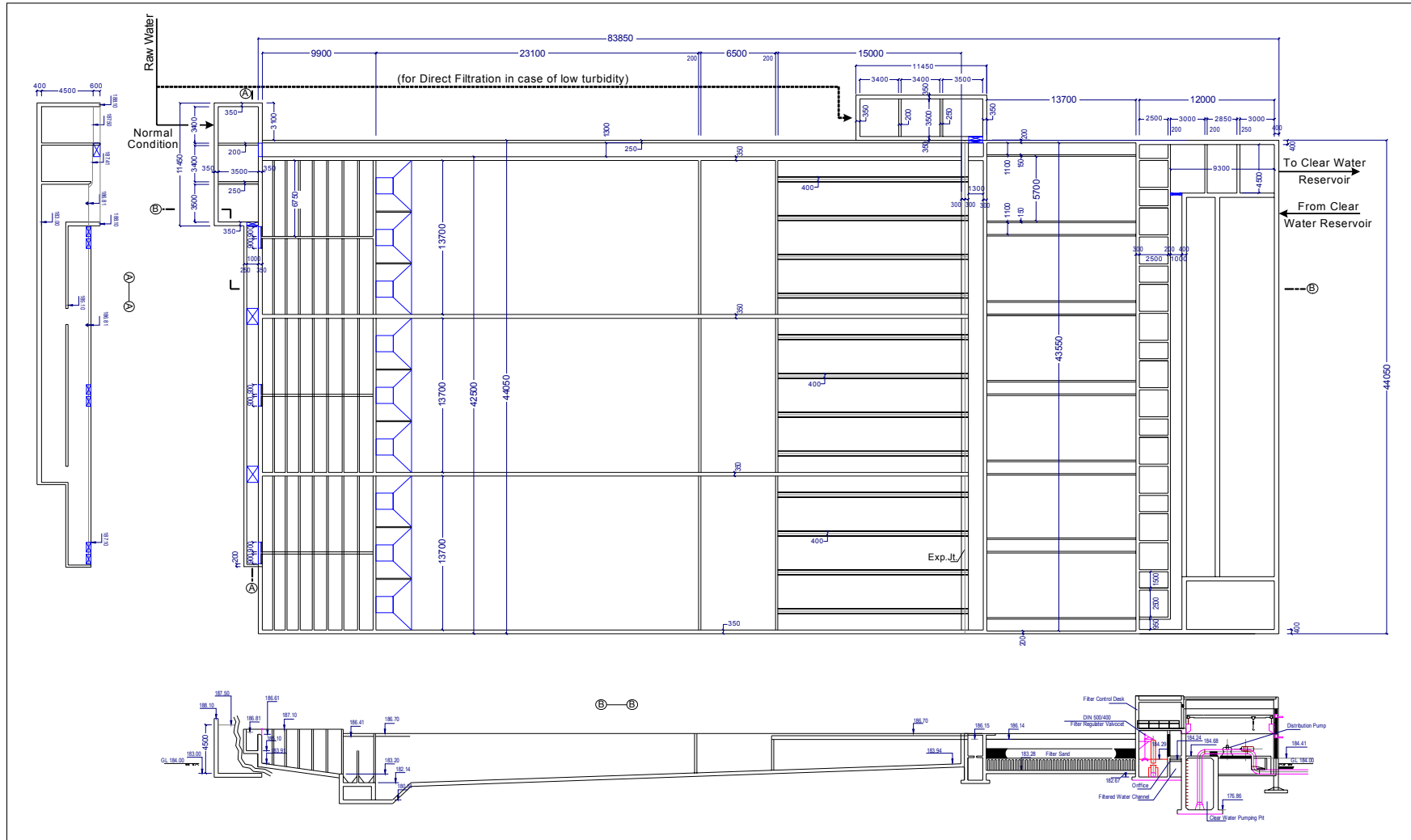
Plan and Section of Flocculation, Sedimentation and Filter in Kaolieo Treatment Plant Expansion: 40,000 m³/day



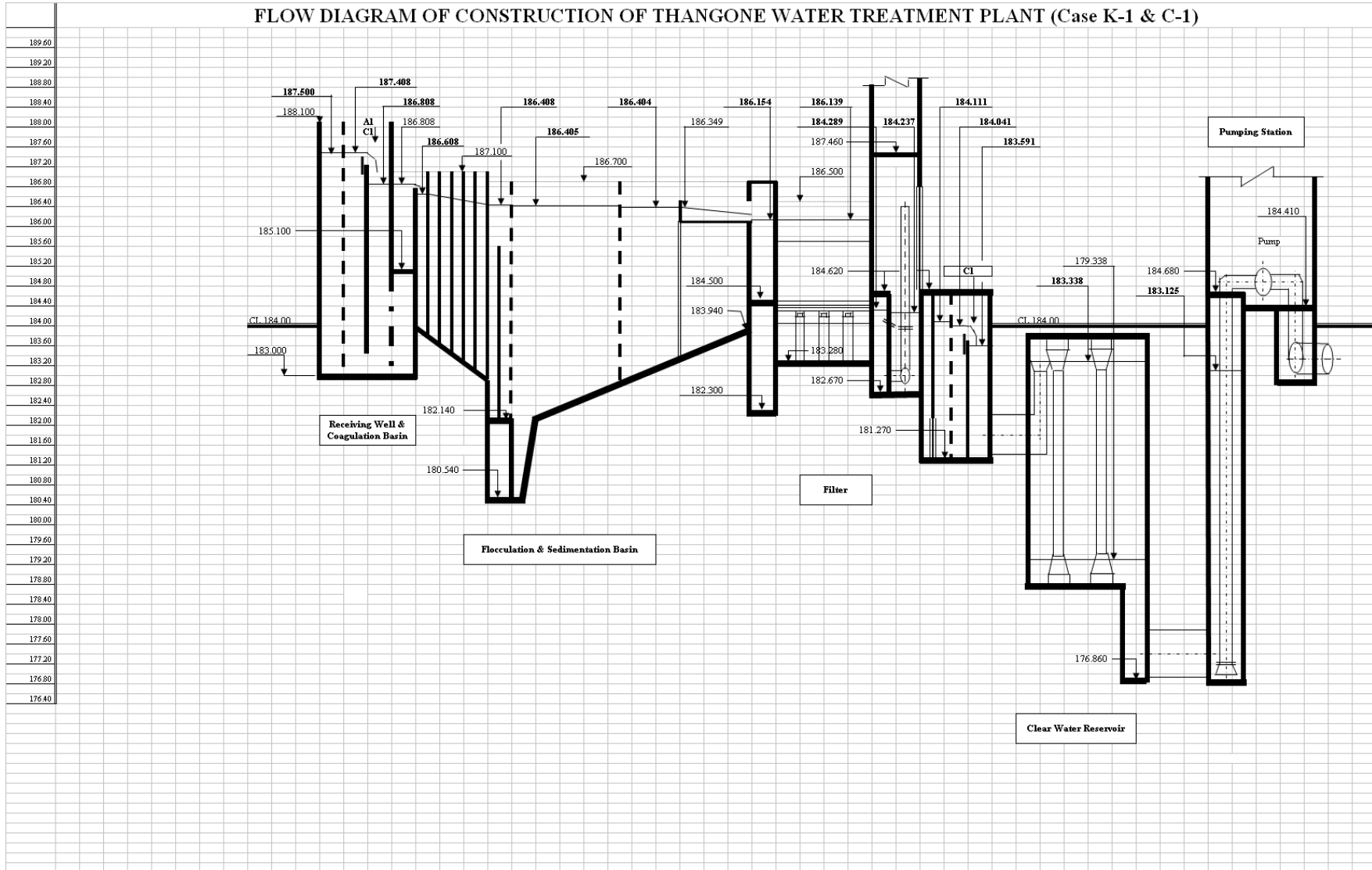
FLOW DIAGRAM OF EXPANSION OF KAOLIEO WATER TREATMENT PLANT (Case K-1)



Plan and Section of Flocculation, Sedimentation and Filter in Thangone Treatment Plant Construction: 60,000 m³/day



FLOW DIAGRAM OF CONSTRUCTION OF THANGONE WATER TREATMENT PLANT (Case K-1 & C-1)



1st Stage

Improvement of Km6 Booster Pumping Station

Planned Components of Facility		
Booster Pumping Facility	Pump House	A=45 m ²
	Transmission Pump	4.8 m ³ /min. x 50 m x 57 kW x 2 Units
	Distribution Pump	6.0 m ³ /min. x 50 m x 72 kW x 3 Units
Electrical Equipment Facility	Power Receiving Facility	Power Receiving and Transformer Equipment
	Power Supply Facility	Power Supply Equipment
	Emergency Generator	Generator Capacity for 1/3 of Trans. & Dis. Pump Capacity
	Instrumentation Equipment	Monitoring, Supervising and Controlling
Landscaping and Others	Including demolition of the existing housing	

2nd Stage

Construction of Distribution Center for Thangone System

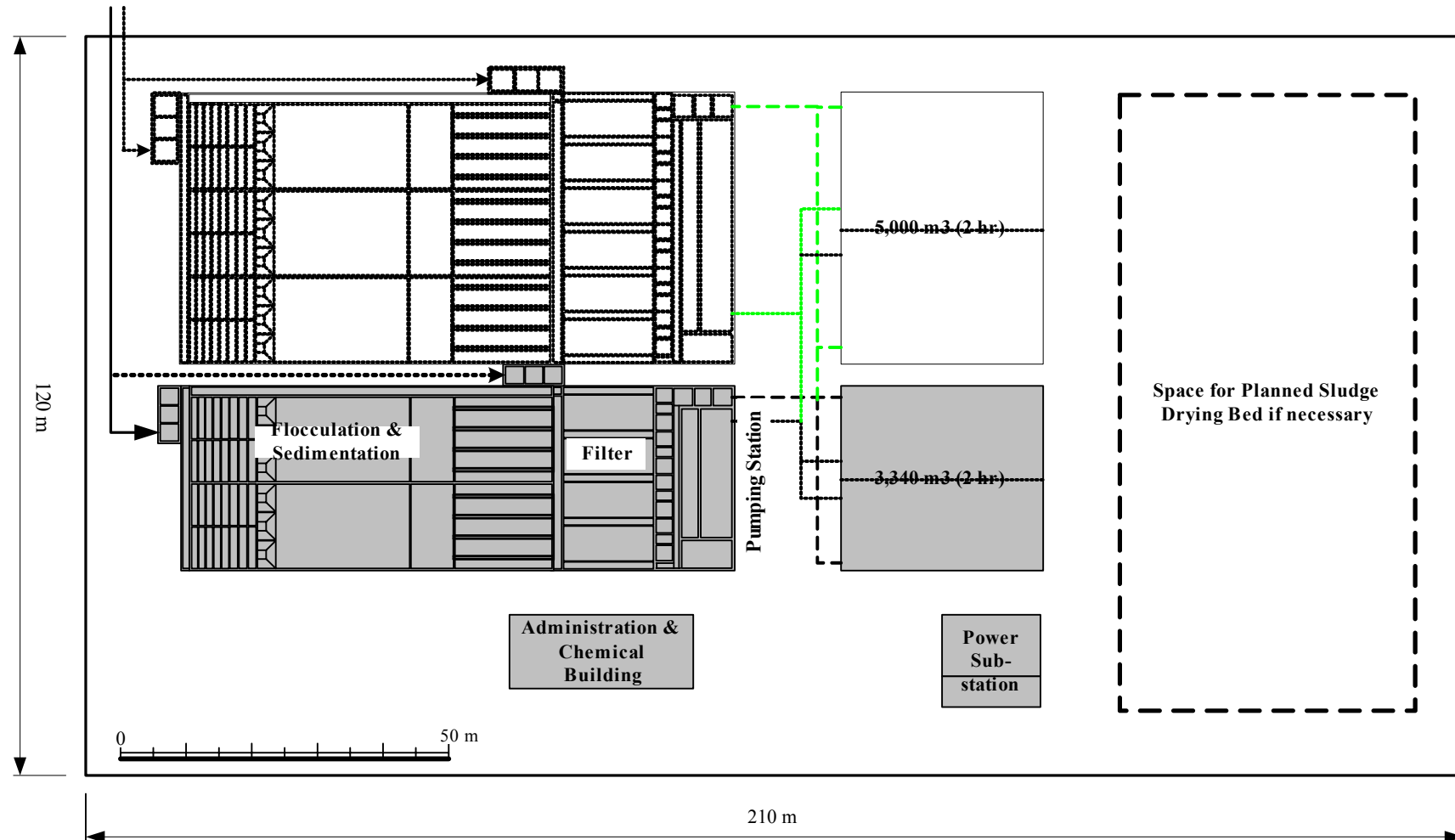
Planned Components of Facility		
Clear Water Reservoir	Clear Water Reservoir	V=10,000 m ³
	Piping	D900mm
Distribution Pumping Facility	Distribution Pump Building	A=320 m ²
	Distribution Pump	13.5 m ³ /min x 67m x 217 kW x 5 Units
Electrical Equipment Facility	Power Receiving Facility	Power Receiving and Transformer Equipment
	Power Supply Facility	Power Supply Equipment
	Emergency Generator	Generator Cap. for 1/3 of Distribution Pump Capacity
	Instrumentation Equipment	Monitoring, Supervising and Controlling
Landscaping and Others		

Improvement of Km12 Booster Pumping Station

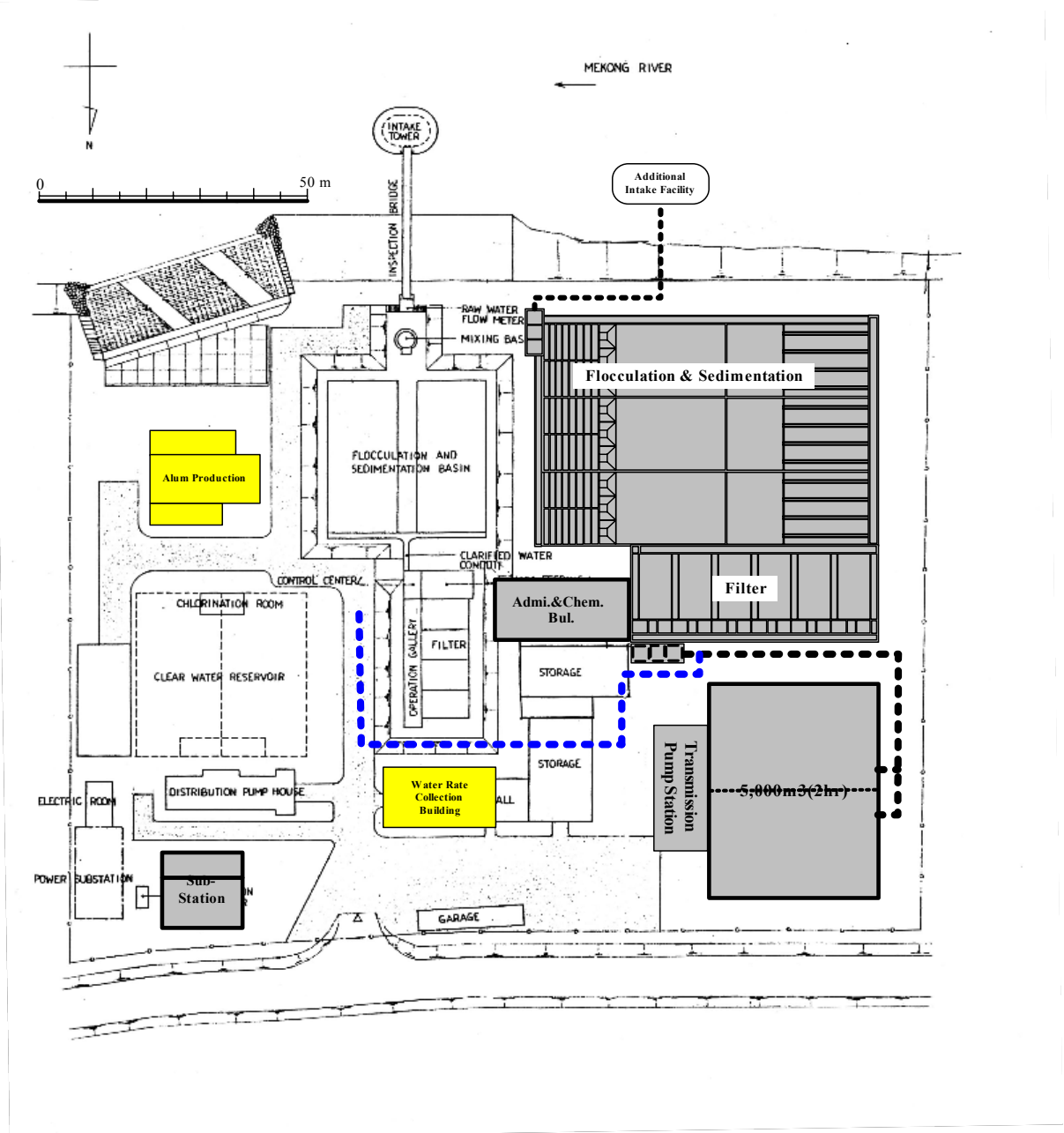
Planned Components of Facility		
Booster Pumping Facility	Pump House	A=25 m ²
	Distribution Pump	3.3 m ³ /min. x 60 m x 48 kW x 3 Units
Electrical Equipment Facility	Power Receiving Facility	Power Receiving and Transformer Equipment
	Power Supply Facility	Power Supply Equipment
	Emergency Generator	Generator Capacity for 1/3 of Distribution Pump Capacity
	Instrumentation Equipment	Monitoring, Supervising and Controlling
Landscaping and Others	Including demolition of the existing housing	

5. ALTERNATIVE T-2

General Plan of Thangone Treatment Plant Construction: 40,000 m³/day



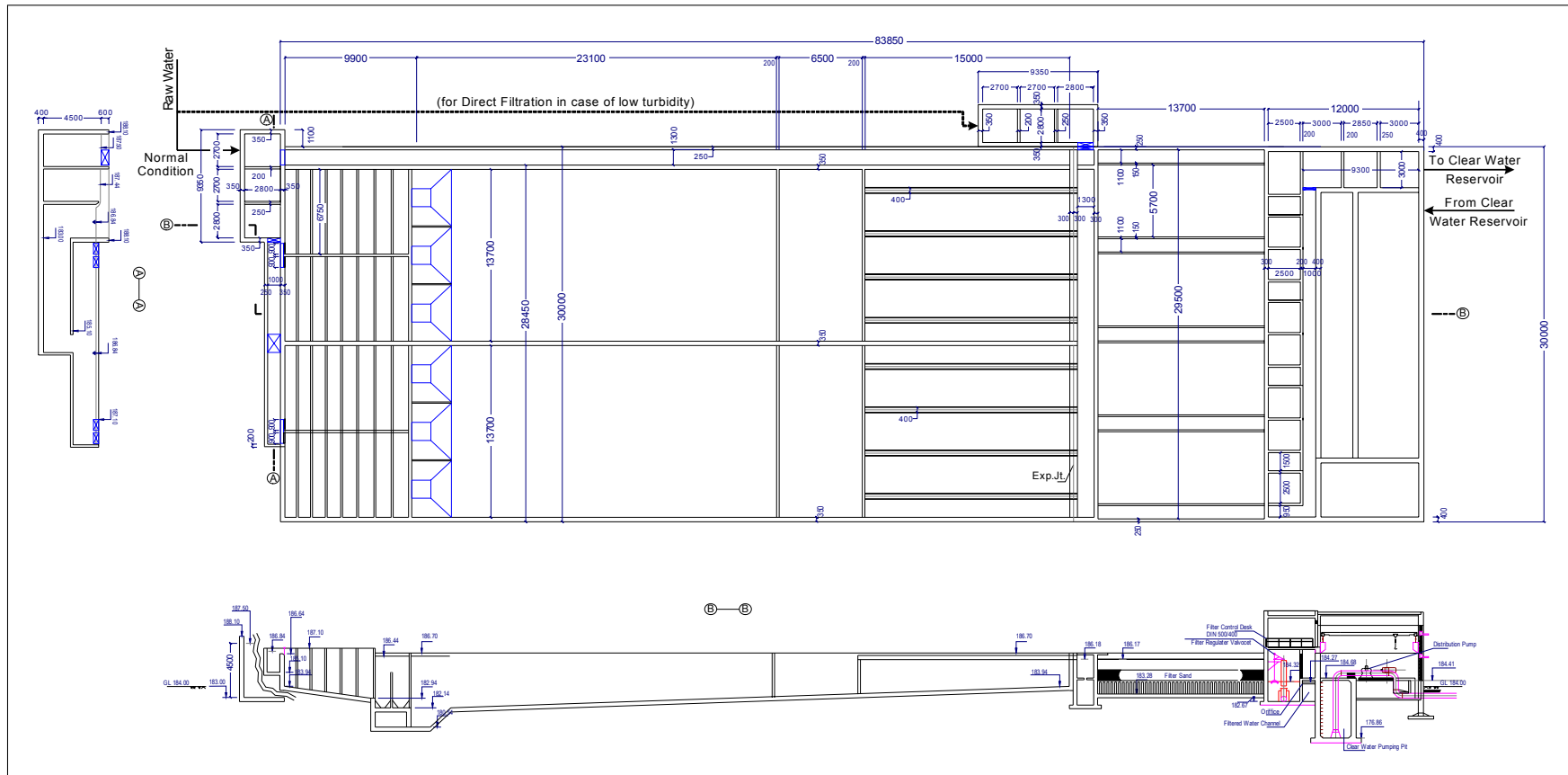
General Plan of Kaolieo Treatment Plant Expansion: 60,000 m³/day



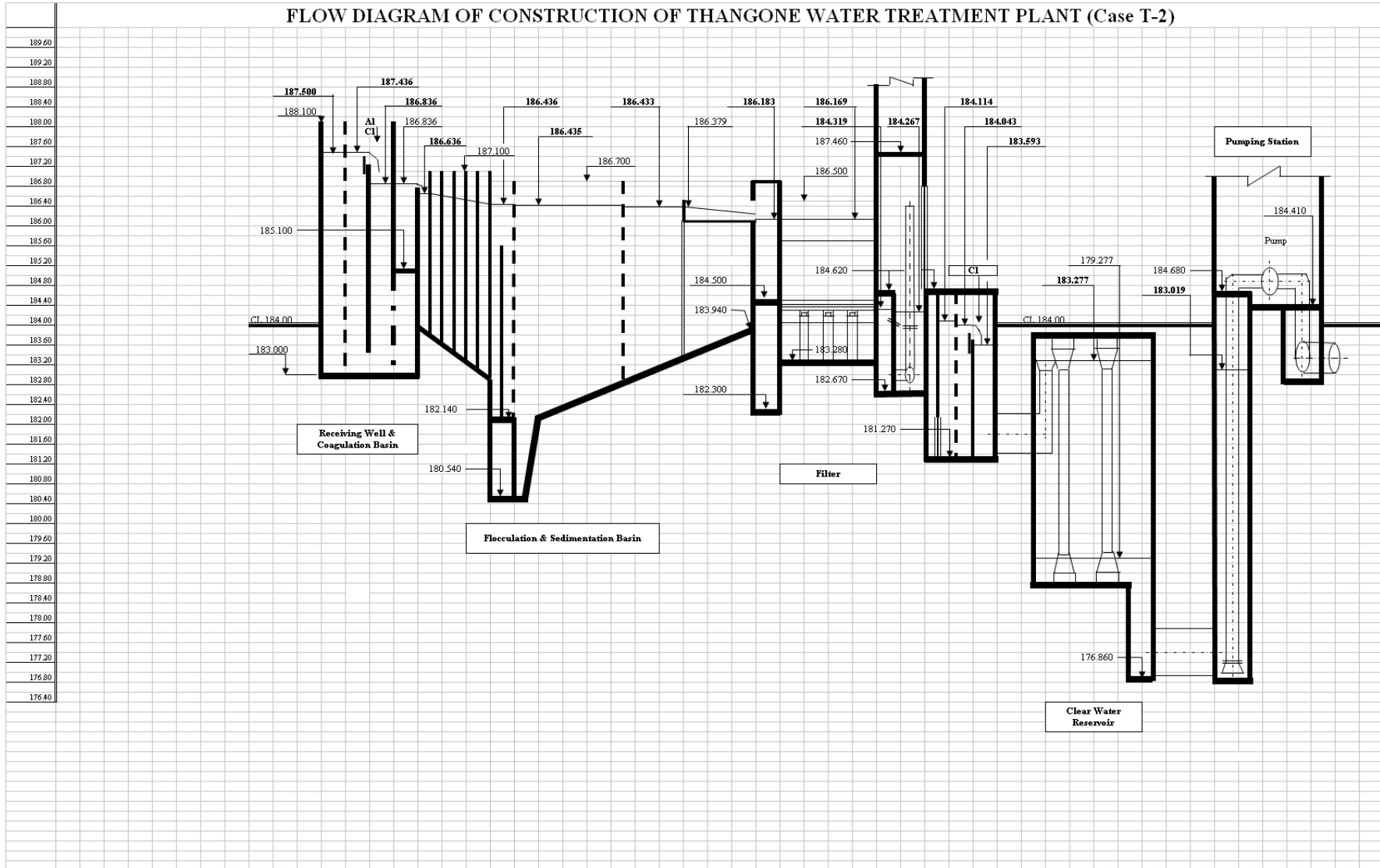
Case T-2
Construction and Expansion of Treatment Plants

1st Stage		Construction of 40,000 m3/day	2nd Stage		Expansion of 60,000 m3/day
Planned Components of Expansion of Thangone Treatment Plant			Planned Components of Construction of Kaolieo Treatment Plant		
Intake Facility	Intake Structure	Construction of New Intake	Intake Facility	Intake Structure	Construction of New Intake
	Intake Pump	15.3 m3/min × 140 kW × 3 Units		Intake Pump	15.3 m3/min × 65 kW × 4 Units
Raw Water Transmission Pipe		D700mm×L530m, Ultrasonic Flow Meter	Raw Water Transmission Pipe		D900 mm×L40 m, Ultrasonic Flow Meter
Receiving Well & Mixing Well (Same Size for Direct Filtration)	Receiving Well	1 Basin (1 Basin), D.T.=2.3 min.	Receiving Well & Mixing Well	Receiving Well	1 Basin, D.T.=2.4 min.
	Mixing Well	1 Basin (1 Basin), D.T.=1.0 min.		Mixing Well	1 Basin, D.T.=1.0 min.
Flocculation & Sedimentation Basin	Flocculation Basin	Up and Down Flow Baffle Channel 2 Units/Basin×2 Basins, D.T.=27.1 min.	Flocculation & Sedimentation Basin	Flocculation Basin	Up and Down Flow Baffle Channel 2 Units/Basin×3 Basins, D.T.=28.3 min.
	Sedimentation Basin	Horizontal Flow /w Launder Trough, 2 Basins D.T.=2.00 hr, Ave.Velocity=0.37 m/min.		Sedimentation Basin	Horizontal Flow /w Launder Trough, 3 Basins D.T.=2.40 hr, Ave.Velocity=0.36 m/min.
Filtration Facility	Filter Basin	A=78.1 m2×4 Basins, V=141 m/d	Filtration Facility	Filter Basin	A=78.0 m2×6 Basins, V=141 m/d
	Filter Washing Equipment	B.W.P.: 47.0m3/min×70kW×2 Units A.B.P.: 94.6m3/min×90kW×2 Units		Filter Washing Equipment	B.W.P.: 47.0m3/min×70kW×2 Units A.B.P.: 94.6m3/min×90kW×2 Units
Filtered Water Measurement & Chlorine Mixing Chamber	Measurement Chamber	1 Basin, D.T.=1.8 min.	Filtered Water Measurement & Chlorine Mixing Chamber	Measurement Chamber	1 Basin, D.T.=1.8 min.
	Mixing Chamber	1 Basin, D.T.=0.7 min.		Mixing Chamber	1 Basin, D.T.=1.1 min.
Clear Water Reservoir	Clear Water Reservoir	V=3,340 m3	Clear Water Reservoir	Clear Water Reservoir	V=5,000 m3
	Piping	D700mm		Piping	D900mm, D600mm
Transmission Pumping Facility	Transmission Pump Building	A=250 m2	Transmission Pumping Facility	Transmission Pump Building	A=320 m2
	Transmission Pump	9.3 m3/min × 42.5m×96 kW×4 Units		Transmission Pump	10.5 m3/min × 54.5m×140 kW×5 Units
Chemical Feeding Facility	Chemical Feeding Equipment	Installation of Equipment and Solution Tank	Chemical Feeding Facility	Chemical Feeding Equipment	Installation of Equipment and Solution Tank
	Chemical Building	In preparation for Administration Building		Chemical Building	In preparation for Administration Building
Electrical Equipment Facility	Power Receiving Facility	Power Receiving and Transformer Equip.	Electrical Equipment Facility	Power Receiving Facility	Power Receiving and Transformer Equip.
	Power Supply Facility	Power Supply Equipment		Power Supply Facility	Power Supply Equipment
	Emergency Generator	Generator Cap. for 1/3 of Trans. Pump Cap.		Emergency Generator	Generator Cap. for 1/3of Trans. Pump Cap.
	Instrumentation Equipment	Monitoring, Supervising and Controlling		Instrumentation Equipment	Monitoring, Supervising and Controlling
Administration Building		A=300m2×2F	Administration Building		A=300m2×2F,
Laboratory		In preparation for Administration Building	Laboratory		In preparation for Administration Building
Landscaping and Others			Landscaping and Others		Including demolition & relocation of existing housings

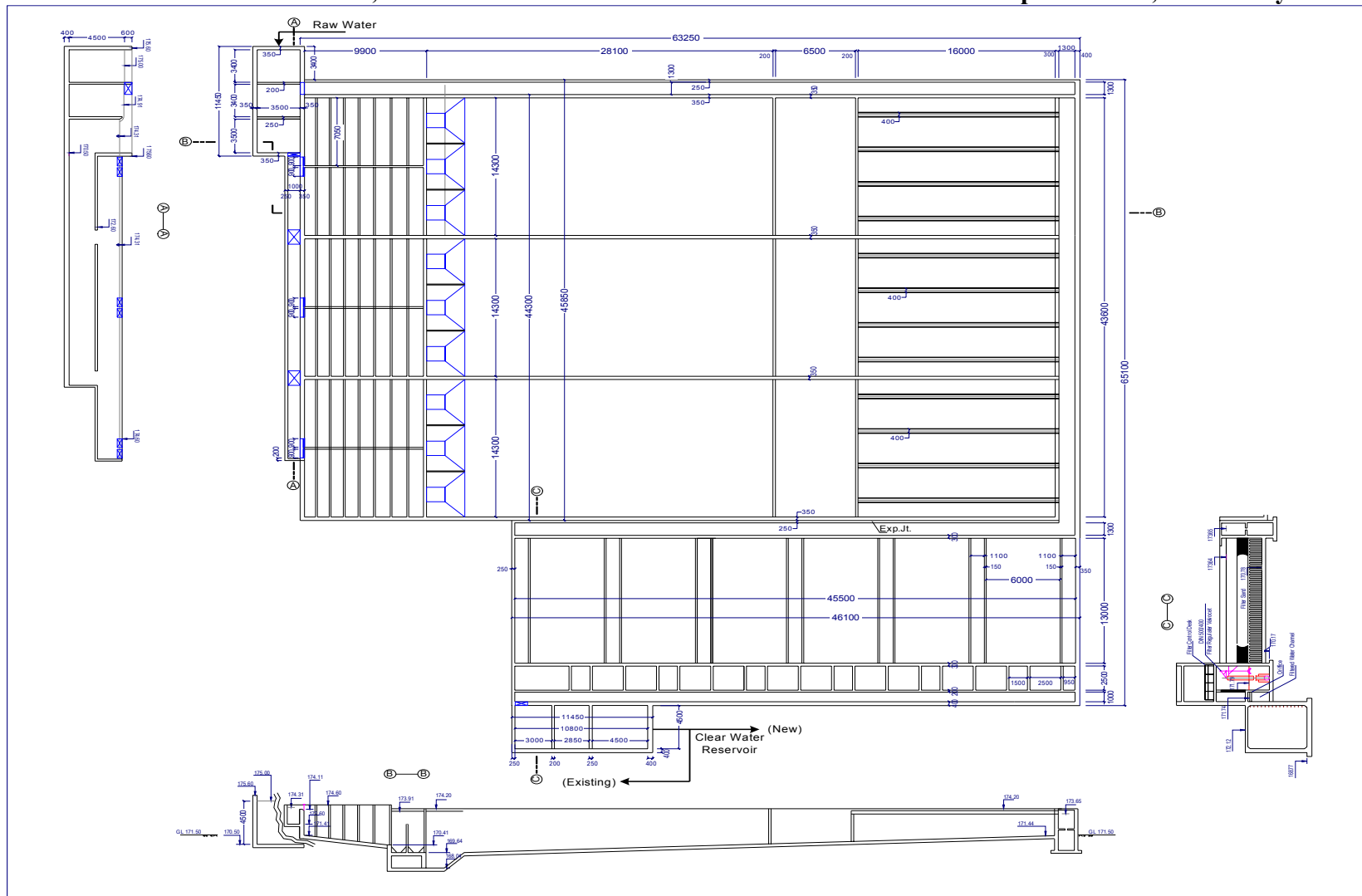
Plan and Section of Flocculation, Sedimentation and Filter in Thangone Treatment Plant Construction: 40,000 m³/day



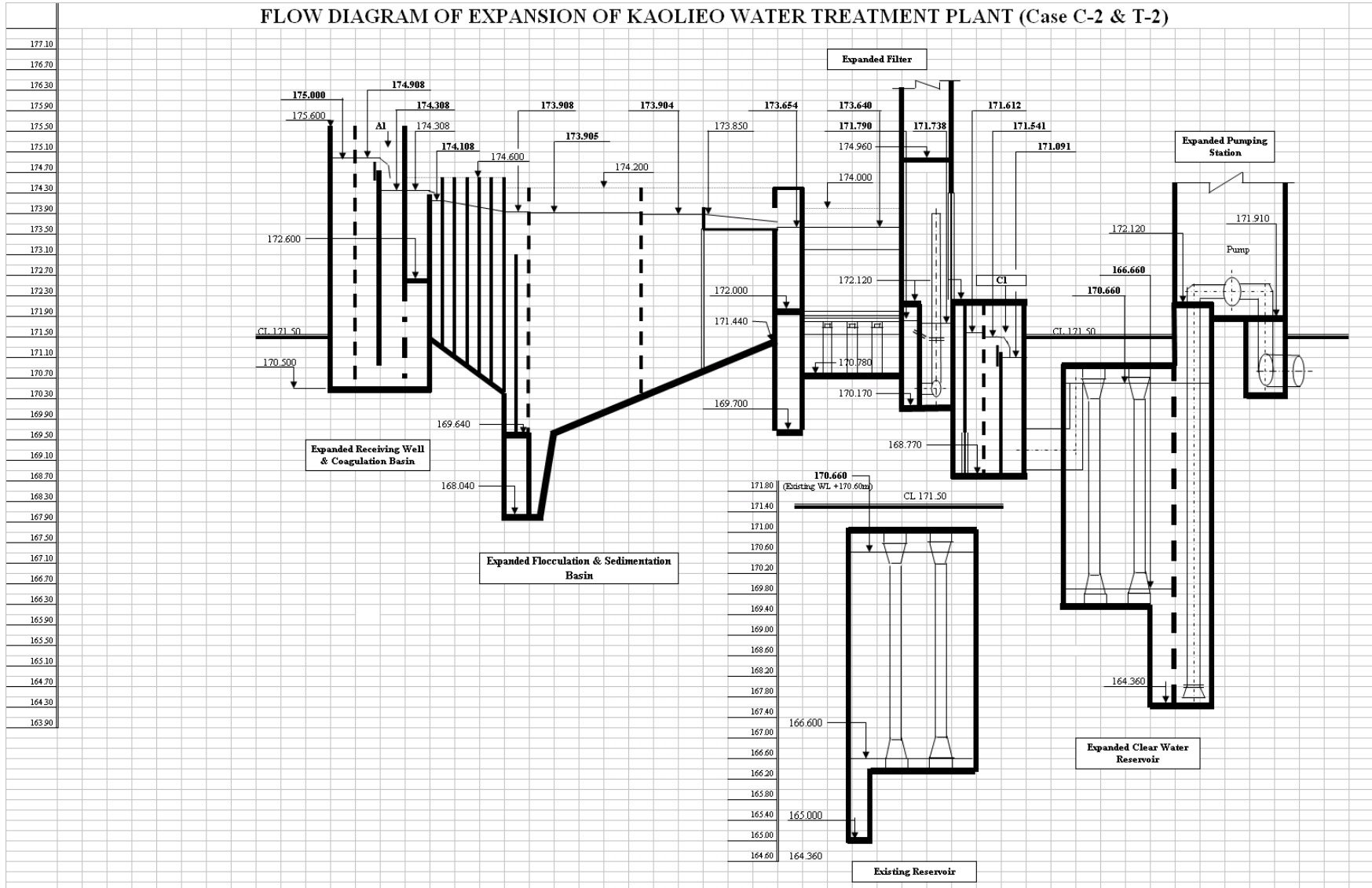
FLOW DIAGRAM OF CONSTRUCTION OF THANGONE WATER TREATMENT PLANT (Case T-2)



Plan and Section of Flocculation, Sedimentation and Filter in Kaolieo Treatment Plant Expansion: 60,000 m³/day



FLOW DIAGRAM OF EXPANSION OF KAOLIEO WATER TREATMENT PLANT (Case C-2 & T-2)



1st Stage

Construction of Distribution Center for Thangone System

Planned Components of Facility		
Clear Water Reservoir	Clear Water Reservoir	V=6,660 m ³
	Piping	D700mm
Distribution Pumping Facility	Distribution Pump Building	A=250 m ²
	Distribution Pump	12.1 m ³ /min × 67m × 195 kW × 4 Units
Electrical Equipment Facility	Power Receiving Facility	Power Receiving and Transformer Equipment
	Power Supply Facility	Power Supply Equipment
	Emergency Generator	Generator Cap. for 1/3 of Distribution Pump Capacity
	Instrumentation Equipment	Monitoring, Supervising and Controlling
Landscaping and Others		

2nd Stage

Construction of Distribution Center for Kaolieo System

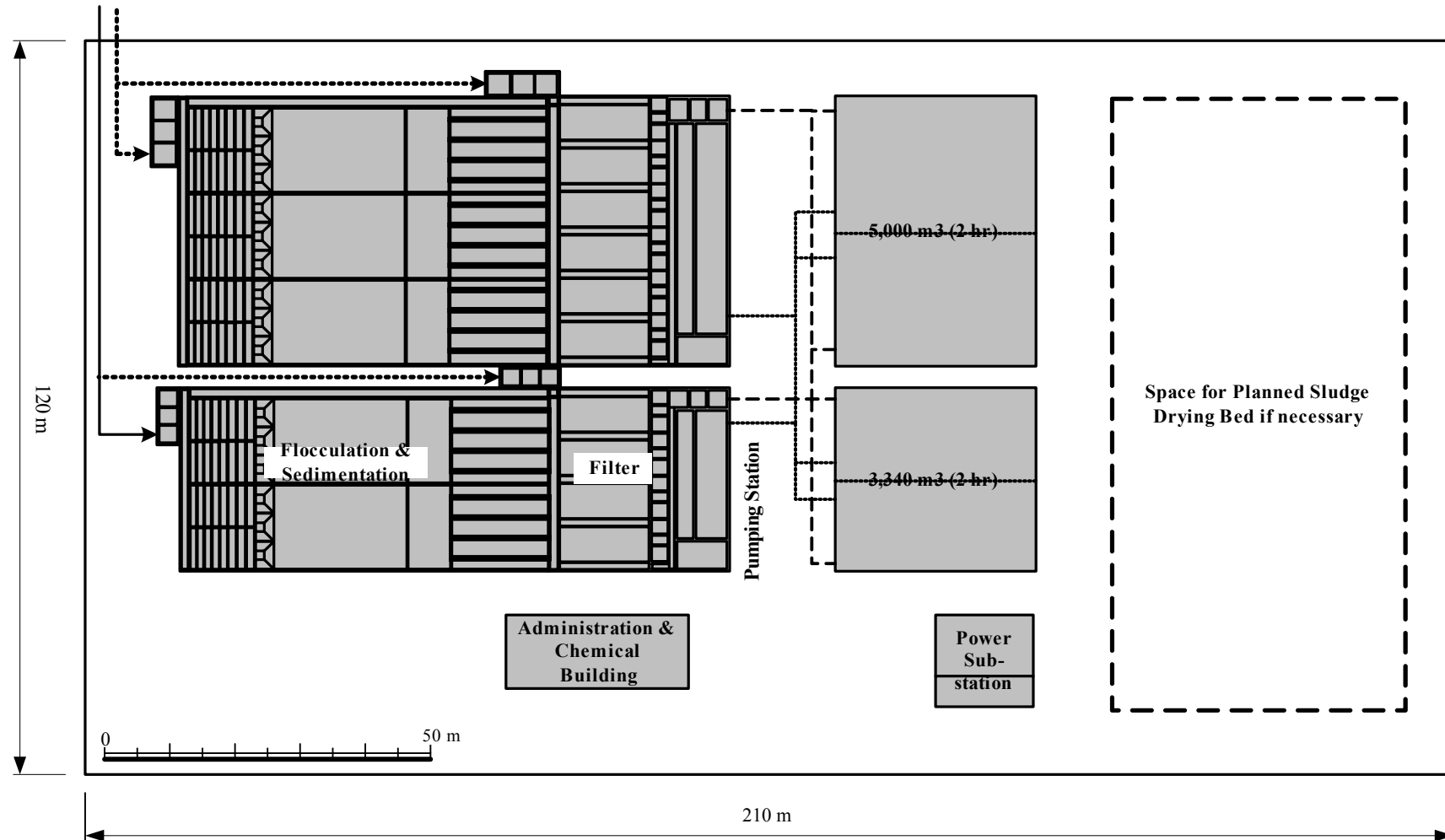
Planned Components of Facility		
Clear Water Reservoir	Clear Water Reservoir	V=10,000 m ³
	Piping	D900mm
Distribution Pumping Facility	Distribution Pump Building	A=320 m ²
	Distribution Pump	13.5 m ³ /min × 67m × 217 kW × 5 Units
Electrical Equipment Facility	Power Receiving Facility	Power Receiving and Transformer Equipment
	Power Supply Facility	Power Supply Equipment
	Emergency Generator	Generator Cap. for 1/3 of Distribution Pump Capacity
	Instrumentation Equipment	Monitoring, Supervising and Controlling
Landscaping and Others		

Improvement of Km12 Booster Pumping Station

Planned Components of Facility		
Booster Pumping Facility	Pump House	A=25 m ²
	Distribution Pump	3.3 m ³ /min. x 60 m x 48 kW x 3 Units
Electrical Equipment Facility	Power Receiving Facility	Power Receiving and Transformer Equipment
	Power Supply Facility	Power Supply Equipment
	Emergency Generator	Generator Capacity for 1/3 of Distribution Pump Capacity
	Instrumentation Equipment	Monitoring, Supervising and Controlling
Landscaping and Others		

6. ALTERNATIVE T-3

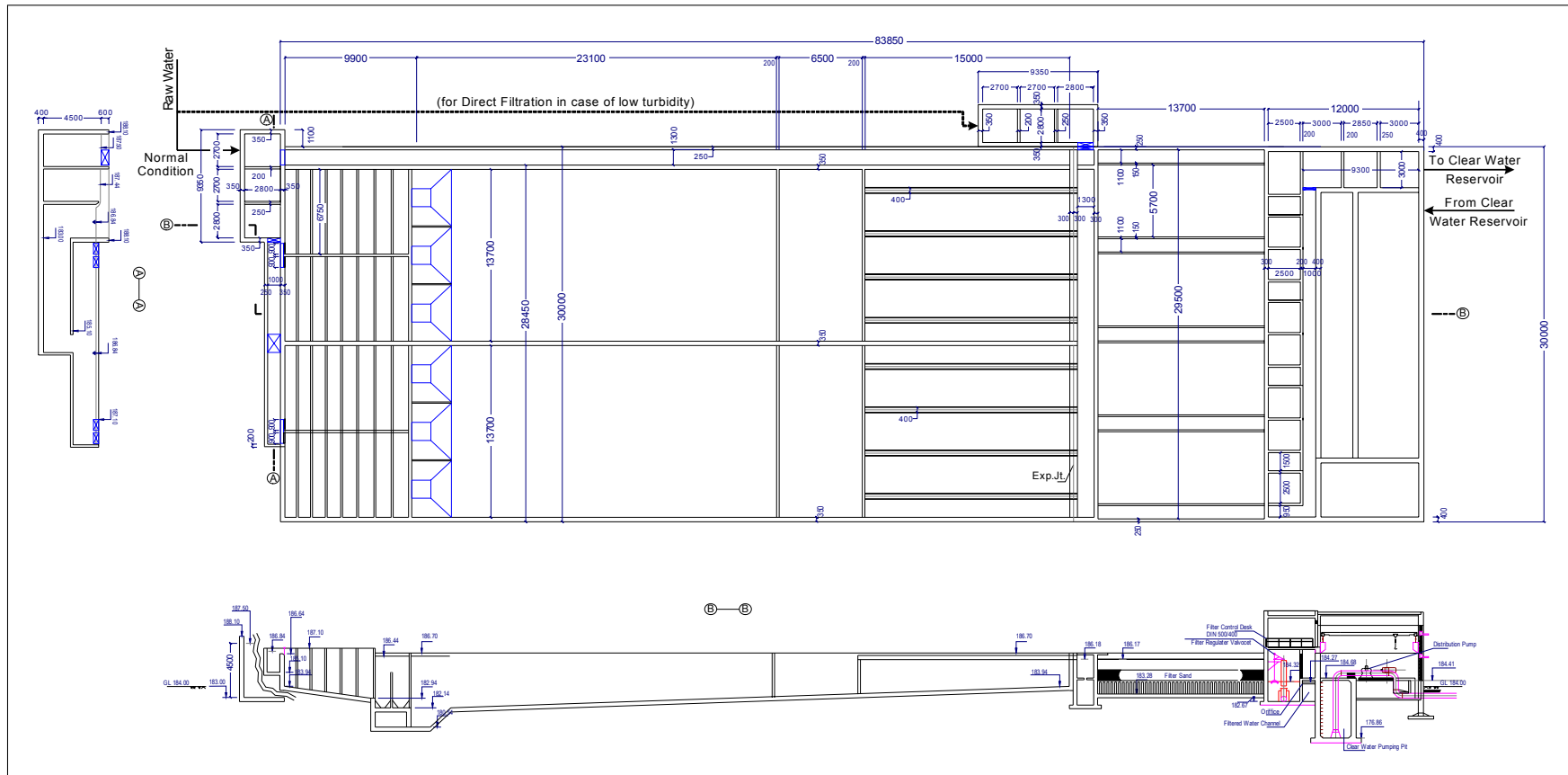
General Plan of Thangone Treatment Plant Construction: 40,000 m³/day and 60,000 m³/day



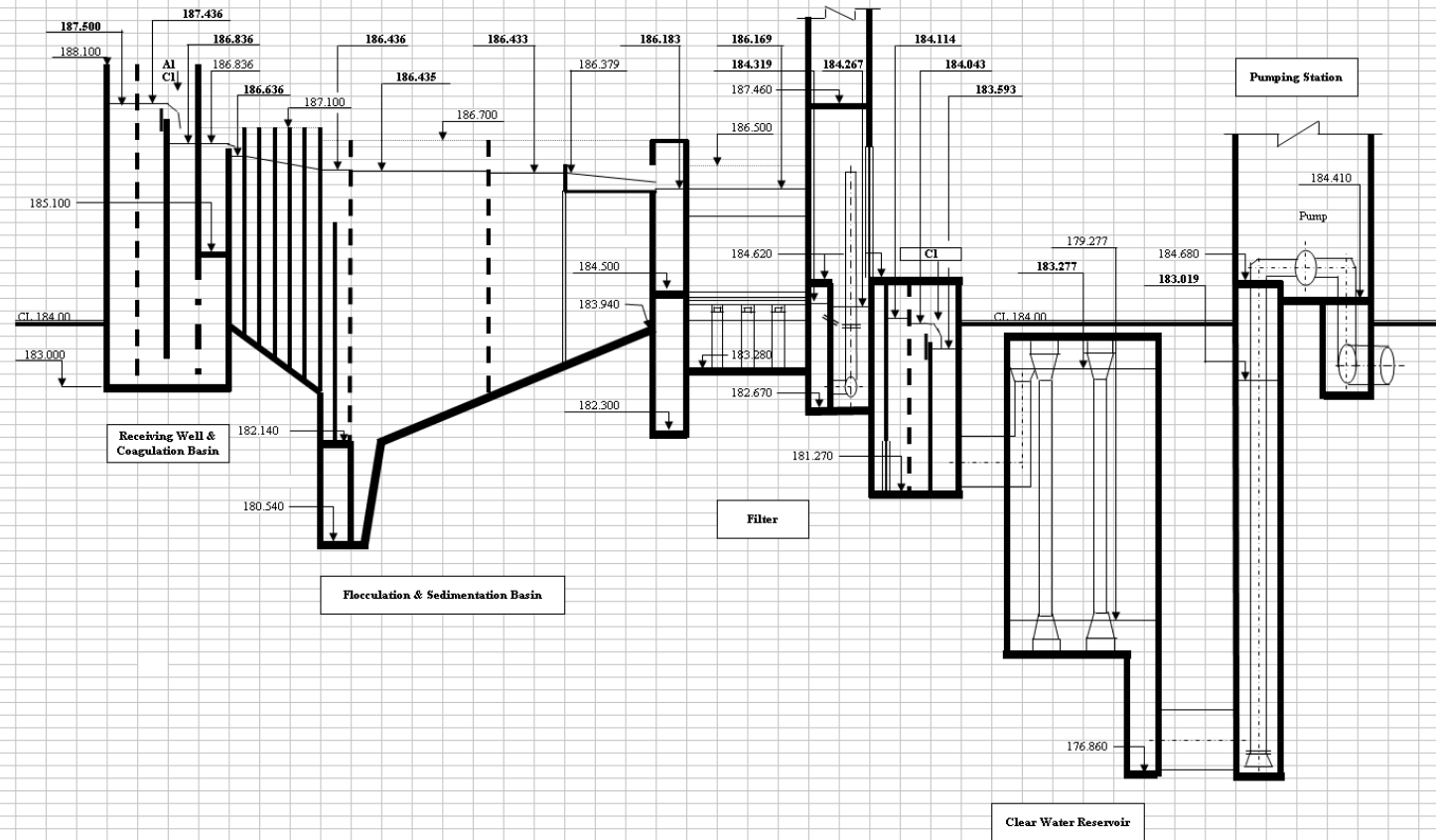
Case T-3
Construction of Treatment Plant

1st Stage		Construction of 40,000 m3/day	2nd Stage		Expansion of 60,000 m3/day
Planned Components of Expansion of Thangone Treatment Plant			Planned Components of Construction of Thangone Treatment Plant		
Intake Facility	Intake Structure	Construction of New Intake	Intake Facility	Intake Structure	Construction of New Intake
	Intake Pump	15.3 m3/min × 140 kW×3 Units		Intake Pump	15.3 m3/min × 140 kW×4 Units
Raw Water Transmission Pipe		D700mm×L530m, Ultrasonic Flow Meter	Raw Water Transmission Pipe		D900 mm×L485 m, Ultrasonic Flow Meter
Receiving Well & Mixing Well (Same Size for Direct Filtration)	Receiving Well	1 Basin (1 Basin), D.T.=2.3 min.	Receiving Well & Mixing Well (Same Size for Direct Filtration)	Receiving Well	1 Basin (1 Basin), D.T.=2.4 min.
	Mixing Well	1 Basin (1 Basin), D.T.=1.0 min.		Mixing Well	1 Basin (1 Basin), D.T.=1.0 min.
Flocculation & Sedimentation Basin	Flocculation Basin	Up and Down Flow Baffle Channel 2 Units/Basin×2 Basins, D.T.=27.1 min.	Flocculation & Sedimentation Basin	Flocculation Basin	Up and Down Flow Baffle Channel 2 Units/Basin×3 Basins, D.T.=27.1 min.
	Sedimentation Basin	Horizontal Flow /w Launder Trough, 2 Basins D.T.=2.00 hr, Ave.Velocity=0.37 m/min.		Sedimentation Basin	Horizontal Flow /w Launder Trough, 3 Basins D.T.=2.00 hr, Ave.Velocity=0.37 m/min.
Filtration Facility	Filter Basin	A=78.1 m2×4 Basins, V=141 m/d	Filtration Facility	Filter Basin	A=78.1 m2×6 Basins, V=141 m/d
	Filter Washing Equipment	B.W.P.: 47.0m3/min×70kW×2 Units A.B.P.: 94.6m3/min×90kW×2 Units		Filter Washing Equipment	Using the Installed Pumps in 1st Stage for Filter Washing
Filtered Water Measurement and Chlorine Mixing Chamber	Measurement Chamber	1 Basin, D.T.=1.8 min.	Filtered Water Measurement & Chlorine Mixing Chamber	Measurement Chamber	1 Basin, D.T.=1.8 min.
	Mixing Chamber	1 Basin, D.T.=0.7 min.		Mixing Chamber	1 Basin, D.T.=0.7 min.
Clear Water Reservoir	Clear Water Reservoir	V=3,340 m3	Clear Water Reservoir	Clear Water Reservoir	V=5,000 m3
	Piping	D700mm		Piping	D900mm
Transmission Pumping Facility	Transmission Pump Building	A=250 m2	Transmission Pumping Facility	Transmission Pump Building	A=320 m2
	Transmission Pump	9.3 m3/min × 42.5m×96 kW×4 Units		Transmission Pump	10.5 m3/min × 42.5m×110 kW×5 Units
Chemical Feeding Facility	Chemical Feeding Equipment	Installation of Equipment and Solution Tank	Chemical Feeding Facility	Chemical Feeding Equipment	Installation of Equipment and Solution Tank
	Chemical Building	In preparation for Administration Building		Chemical Building	Using the Constructed Building in 1st Stage
Electrical Equipment Facility	Power Receiving Facility	Power Receiving and Transformer Equip.	Electrical Equipment Facility	Power Receiving Facility	Power Receiving and Transformer Equip.
	Power Supply Facility	Power Supply Equipment		Power Supply Facility	Power Supply Equipment
	Emergency Generator	Generator Cap. for 1/3 of Trans. Pump Cap.		Emergency Generator	Generator Cap. for 1/3 of Trans. Pump Cap.
	Instrumentation Equipment	Monitoring, Supervising and Controlling		Instrumentation Equipment	Monitoring, Supervising and Controlling
Administration Building		A=300m2×2F	Administration Building		Using the Constructed Building in 1st Stage
Laboratory		In preparation for Administration Building	Laboratory		Water Quality Analysis Equipment
Landscaping and Others			Landscaping and Others		

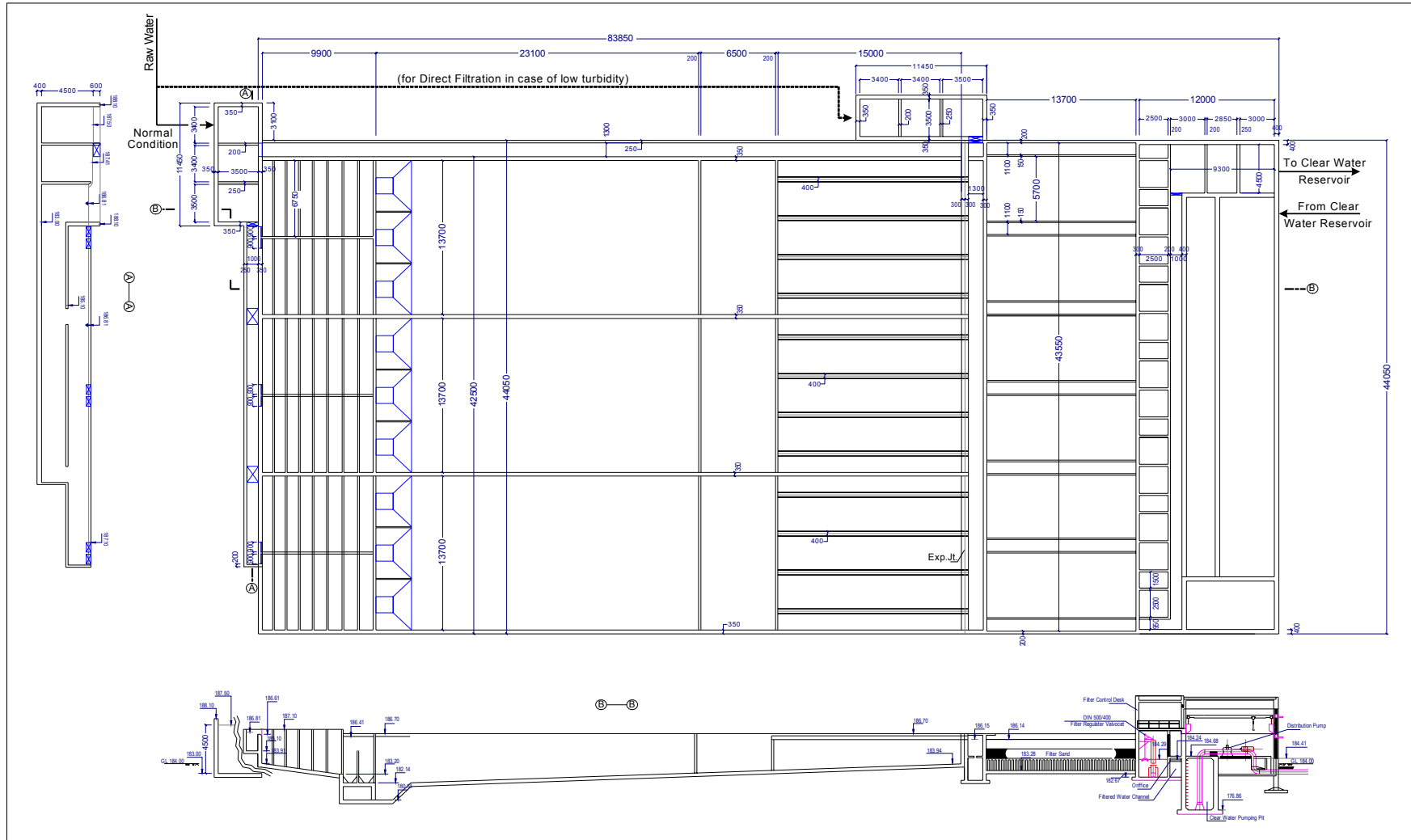
Plan and Section of Flocculation, Sedimentation and Filter in Thangone Treatment Plant Construction: 40,000 m³/day



FLOW DIAGRAM OF CONSTRUCTION OF THANGONE WATER TREATMENT PLANT (Case T-3)



Plan and Section of Flocculation, Sedimentation and Filter in Thangone Treatment Plant Construction: 60,000 m³/day



Construction of Distribution Center for Thangone System

1 st Stage		Planned Components of Facility		2 nd Stage		Planned Components of Facility		
Clear Water Reservoir	Clear Water Reservoir	V=6,660 m ³		Clear Water Reservoir	Clear Water Reservoir	V=10,000 m ³		
	Piping	D700mm			Piping	D900mm		
Distribution Pumping Facility	Distribution Pump Building	A=250 m ²		Distribution Pumping Facility	Distribution Pump Building	A=320 m ²		
	Distribution Pump	12.1 m ³ /min ×67m×195 kW×4 Units			Distribution Pump	13.5 m ³ /min ×67m×217 kW×5 Units		
Electrical Equipment Facility	Power Receiving Facility	Power Receiving and Transformer Equipment		Electrical Equipment Facility	Power Receiving Facility	Power Receiving and Transformer Equipment		
	Power Supply Facility	Power Supply Equipment			Power Supply Facility	Power Supply Equipment		
	Emergency Generator	Generator Cap. for 1/3 of Distribution Pump Capacity			Emergency Generator	Generator Cap. for 1/3 of Distribution Pump Capacity		
	Instrumentation Equipment	Monitoring, Supervising and Controlling			Instrumentation Equipment	Monitoring, Supervising and Controlling		
Landscaping and Others				Landscaping and Others				

2nd Stage

Improvement of Km6 Booster Pumping Station

Planned Components of Facility		
Booster Pumping Facility	Pump House	A=25 m ²
	Distribution Pump	4.5 m ³ /min. x50 m x 54 kW x 3 Units
Electrical Equipment Facility	Power Receiving Facility	Power Receiving and Transformer Equipment
	Power Supply Facility	Power Supply Equipment
	Emergency Generator	Generator Capacity for 1/3 of Distribution Pump Capacity
	Instrumentation Equipment	Monitoring, Supervising and Controlling
Landscaping and Others		Including demolition of the existing housing

Improvement of Km12 Booster Pumping Station

Planned Components of Facility		
Booster Pumping Facility	Pump House	A=25 m ²
	Distribution Pump	3.3 m ³ /min. x 60 m x 48 kW x 3 Units
Electrical Equipment Facility	Power Receiving Facility	Power Receiving and Transformer Equipment
	Power Supply Facility	Power Supply Equipment
	Emergency Generator	Generator Capacity for 1/3 of Distribution Pump Capacity
	Instrumentation Equipment	Monitoring, Supervising and Controlling
Landscaping and Others		Including demolition of the existing housing