

DEPARTMENT OF IRRIGATION
AND DRAINAGE MALAYSIA

Report of Meeting

The 35th Meeting of Thailand – Malaysia Joint Technical Working Group on the Golok River Mouth Improvement Project

**25 – 26 July 2017
Chiang Mai, Thailand**

TABLE OF CONTENT

Agenda 1: Opening address

Agenda 2: Matters for Information

- 2.1 Report on Monitoring and Evaluation of Golok River Mouth
- 2.2 Maintenance Dredging of Golok River Mouth
- 2.3 Protection Work at Transit Point B
- 2.4 Rehabilitation and Protection Works at Golok River Mouth
- 2.5 Mutual Calibration of Rating Curve at Cableway Station
- 2.6 Real Time Monitoring System and the Joint Website for Golok River Basin

Agenda 3: Other matters

- 3.1 Integrated River Basin Management (IRBM) Plan for Golok River Basin
- 3.2 Road Map for Joint Implementation Works
- 3.3 Date and venue for next JTWG meeting
- 3.4 Date and venue for next JSC meeting

Agenda 4: Matters to be referred to JSC

Agenda 5: Adoption of minutes of meeting

Appendix A	List of delegates
Appendix B	Agenda
Appendix C	Pre-monsoon survey (Oct 2016) & Post-monsoon survey (Mar 2017)
Appendix D	The bed level and section across tip of Thai breakwater and Malaysian breakwater
Appendix E	The bed level and section across CH200
Appendix F	Revised schedule of rehabilitation and protection works at Golok river mouth
Appendix G	Mutual gauging measurements 2016 & 2017
Appendix H	The mutual rating curve (2016)
Appendix J	Revised schedule for new telemetering stations
Appendix K	Road map for the joint implementation works

**Report on the 35th Meeting of
Thailand – Malaysia Joint Technical Working Group
On The Golok River Mouth Improvement Project
25 – 26 July 2017
Chiang Mai, Thailand**

AGENDA 1: OPENING ADDRESS

Dr. Somkiat Prajamwong Deputy Director General for Engineering, Royal Irrigation Department Thailand, the leader of the Thai delegates welcomed the Malaysian delegates to the 35th Meeting of Thailand – Malaysia Joint Technical Working Group (JTWG) on the Golok River Mouth Improvement Project. He also congratulated Dato' Ir. Dr. Haji Md. Nasir bin Md. Noh upon his appointment as Deputy Director General (Business Sector), Department of Irrigation and Drainage Malaysia.

Dato' Ir. Dr. Haji Md. Nasir bin Md Noh, the leader of the Malaysian delegates expressed his appreciation for the warm welcome and arrangements for the Meeting.

Both sides introduced their delegates and the list of delegates is as shown in APPENDIX A. The Meeting adopted the agenda as shown in APPENDIX B.

AGENDA 2: MATTERS FOR INFORMATION

2.1 Report on Monitoring and Evaluation of Golok River Mouth

Report by JET

- (1) The 2017 post-monsoon survey was carried out by the Malaysian side in March 2017, as shown in APPENDIX C. It was observed that sedimentation area on the Malaysian side has decreased whilst erosion area on the Thai side has increased compared to the pre-monsoon survey (October 2016).

- (2) The sedimentation volume (where bed level is shallower than -3.0m MSL within the navigation channel) has decreased compared to the condition in during pre-monsoon (October 2016) where no sedimentation was observed inside the navigation channel.
- (3) The maximum bed level at the river mouth was observed to be -3.0m MSL, located at the navigation channel; the observed bed level was shallower than previous survey which was -3.1m MSL (October 2016).
- (4) The deepest bed level around tip of Thai breakwater is observed to be -5.5 m MSL which may lead to instability of Thai breakwater. This level is deeper compared to the previous survey in October 2016.
- (5) No correlation could be made between the maximum discharge reading at the cableway station (X.119A) with the opening/closing of the Golok River mouth since the only factor considered is the river flow and the discharges are recorded about 40km upstream of the river mouth.
- (6) Hence, the Meeting agreed that there is a need to measure the wave parameters that affect the river mouth. Installation of a new station for measuring the discharge at the river mouth area should also be considered.

Discussion by JTWG

The Meeting agreed that:

- (i) the monitoring survey to be continued and for JET to continue analyzing the dynamic phenomenon at the river mouth, sedimentation issue and the erosion at the tip of Thai breakwater; and
- (ii) a new station for discharge measurement at the river mouth should be installed and the wave parameters that affect the river mouth should be measured. JET should study in detail the method and instruments needed to

collect the required data. The cost of the data collection should also be proposed by JET for acknowledgement of JTWG.

2.2 Maintenance Dredging of Golok River Mouth

Criteria for Maintenance Dredging

As agreed in JET25, JTWG32 and JSC14, the maintenance dredging is required based on the following criteria:

- (1) When the cross section area of the river mouth between Thailand and Malaysia breakwater tip is blocked up to 30% (based on Thai study); or
- (2) When the bed level of the river mouth is at -2.0 m MSL or shallower (based on Malaysian study);

The sediment patterns are to be monitored for at least 2 consecutive monsoon seasons in order to identify the need for maintenance dredging.

Report by JET

The section across Thai breakwater and Malaysian breakwater for pre-monsoon (October 2016) and post-monsoon survey (March 2017) is as shown in APPENDIX D. The cross-section across at CH+0.200 for various survey is as shown in APPENDIX E.

The cross-sections showed that:

- (a) The sedimentation area was approximately 5% in the pre-monsoon survey and there was no blockage in the post-monsoon survey. In both surveys, the sedimentation area were less than the dredging criteria (30% of area blockage).
- (b) It was observed that the bed level at the river mouth measured at the center line of navigation channel was -3.1m MSL and -3.0m MSL respectively in pre- and post-monsoon survey. In both survey, the bed level at the river mouth were deeper than the dredging criteria (-2.0m MSL).
- (c) Erosion at the tip of Thai breakwater was approximately -4.90m MSL and -5.50m MSL respectively in pre- and post-monsoon survey.

- (d) Maintenance dredging is not required based on the pre- and post-monsoon survey.

Discussion by JTWG

The Meeting agreed that:

- (i) at present, there is no need to carry out maintenance dredging according to the maintenance dredging criteria;
- (ii) the maintenance dredging criteria are to be maintained as common criteria for drainage purpose (Thai side) and for navigational purpose (Malaysian side); and
- (iii) for the criteria of navigational purpose, the bed level at the river mouth shall refer to the shallowest depth allowed for safe navigation throughout the navigation channel.

2.3 Protection Work at Transit Point B

Report by JET

The Meeting was informed that two Joint Technical Meeting for Golok River Mouth Physical Modelling Works were held on 27 – 28 September 2016 and 28 February – 1 March 2017 in Royal Irrigation Department (RID) Hydraulic Laboratory in Nonthaburi, Thailand.

The Meeting was informed that due to the restriction of the 3D physical model, 2D physical model was performed to study and determine the suitable shape of the protection works at Transit Point B. For 2D physical model, three (3) scenarios were tested on the protection works for Transit Point B namely, existing condition, oval shaped protection work and hexagonal shaped protection work. Each of the 2D physical models will be carried out for various discharge capacity and water level to assess flow pattern, scouring depth and scouring pattern around Transit Point B.

Based on the 2D physical model test results, the Meeting agreed that Thai side shall proceed with detailed design for the hexagonal shape protection works around Transit Point B. Thai side will present the detailed design in the next JET meeting.

Discussion by JTWG

The Meeting agreed that:

- (i) the need to implement hexagonal protection works for Transit Point B shall be confirmed by the 3D physical model;
- (ii) the mechanism of implementation of protection works shall be studied and proposed by JET for acknowledgement by JTWG and endorsement by JSC; and
- (iii) The implementation of protection work shall be endorsed and agreed by JSC before implementation.

2.4 Rehabilitation and Protection Works at Golok River Mouth

Report by JET

The Thai side informed that the Feasibility Study (FS), Environmental Impact Assessment (EIA) study and detailed design were completed in July 2017 and the Environmental Impact Assessment (EIA) study is expected to obtain approval by December 2017.

Both sides agreed that the detailed design for rehabilitation works at Golok River Mouth (breakwater extension, training wall and groyne) should be based on the results of the physical model. Hence, the Malaysian side informed that the detailed design (for groyne) may start in July 2017 and will take approximately 10 months to complete. The revised schedule of work for both sides is as shown in APPENDIX F.

Discussion by JTWG

The Meeting agreed that:

- (i) the detailed design of rehabilitation works at Golok River Mouth shall refer to the results of the 3D physical model; and

- (ii) the mechanism of implementation of rehabilitation works shall be studied and proposed by JET.

2.5 Mutual Calibration of Rating Curve at Cableway Station

Report by JET

In 2016, eleven (11) mutual gauging measurements were done monthly except in January and June 2016 where measurements were done on two occasion. In 2017, three (3) mutual gauging measurements were done monthly. The mutual gauging measurements are as shown in APPENDIX G.

The Meeting agreed to adopt the rating curve developed using data measured by River Surveyor (M9) in 2015 and 2016 as the mutual rating curve 2016. The mutual rating curve 2016 is as shown in APPENDIX H.

Discussion by JTWG

The Meeting acknowledge that:

- (i) the need to continue mutual gauging measurements at Golok Cableway Station;
- (ii) the usage of River Surveyor (M9) for mutual gauging measurements; and
- (iii) the establishment of mutual rating curve (2016) by JET. The mutual rating curve will be used for any study and improvement works related to the joint program of the Golok River in the future.

2.6 Real Time Monitoring System and Joint Website for Golok River Basin

Report by JET

New telemetering stations and joint website

The Meeting was informed that the progress for 6 new telemetering stations in Thailand and 3 new telemetering stations in Malaysia will only share rainfall data. The completion of the rainfall and water level data sharing is expected in the next JTWG meeting in July 2018. The revised schedule for new telemetering stations is as shown in APPENDIX J.

Discussion by JTWG

The Meeting acknowledge that:

- (i) the report by JET regarding the status of new Telemetering stations and the Joint web site; and
- (ii) both sides to proceed with the revised schedule of work for new telemetering stations.

AGENDA 3: OTHER MATTERS

3.1 Integrated River Basin Management Plan (IRBM) for Golok River Basin

Report by JET

The Meeting was informed that the Malaysian side working committee is still working on the draft amendments to the principal Agreement. The draft amendments to the principal Agreement is not ready to be discussed in this JTWG meeting. The Meeting was informed that the draft amendments to the principal Agreement will be presented in the 32nd JET meeting.

Discussion by JTWG

- (i) The Malaysian side working committee is still working on the draft amendments to the principal Agreement. The draft amendments to the principal Agreement is not ready to be presented in this Meeting.
- (ii) The draft amendments to the principal Agreement will be presented in next meeting.

3.2 Road Map for Joint Implementation Works

Report by JET

The Meeting was informed that the road map for the joint implementation works is shown as per APPENDIX K.

Discussion by JTWG

- (i) The Meeting agreed with the road map and insists that the road map for “Protection Works at Transit Point B” shall be inserted after the financial and technical issues have been resolved by both countries.

3.3 Date and venue for the next JTWG meeting

The Meeting agreed to convene the 36th JTWG Meeting as follows:

Host:	Malaysia
Proposed date:	June 2018
Proposed venue:	1) Kota Kinabalu 2) Langkawi 3) Penang

3.4 Date and venue for the next JSC meeting

The Meeting proposed to convene the 16th JSC Meeting as follows:

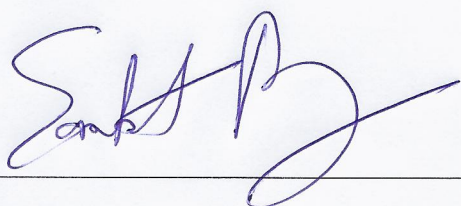
Host:	Malaysia
Proposed date:	October / November 2018
Proposed venue:	1) Kuala Terengganu 2) Genting Highland 3) Kuching

AGENDA 4: MATTERS TO BE REFERRED TO THE JSC

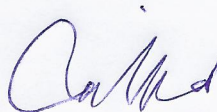
The matters to be referred to the JSC will be proposed in the next JTWG meeting.

AGENDA 5: ADOPTION OF MINUTES OF THE MEETING

The Meeting agreed to adopt the report of meeting of the Thirty-fifth Meeting of Thailand – Malaysia Joint Technical Working Group (JTWG) on the Golok River Mouth Improvement Project.



(Dr. Somkiat Prajamwong)
Co-Chairman
Joint Technical Working Group, Thailand
Deputy Director General
for Engineering
Royal Irrigation Department
Thailand



(Dato' Ir. Dr. Haji Md. Nasir bin Md. Noh)
Co-Chairman
Joint Technical Working Group, Malaysia
Deputy Director General
(Business Sector)
Department of Irrigation and Drainage
Malaysia

APPENDIX A

THE 35TH MEETING OF THAILAND - MALAYSIA JOINT TECHNICAL WORKING GROUP (JTWG) ON THE GOLOK RIVER MOUTH IMPROVEMENT PROJECT

LIST OF THAI DELEGATES

1.		Name Designation Department Contact no. Email	Dr. Somkiat Prajamwong Deputy Director General for Engineering Royal Irrigation Department Thailand +662 667 0960 somkiat_pa09@yahoo.com
2.		Name Designation Department Contact no. Email	Mr. Pradab Kradkhempetch Director Bureau of Project Management Royal Irrigation Department Thailand +662 241 0068 pradab_kla@hotmail.com
3.		Name Designation Department Contact no. Email	Mr. Thanar Suwattana Director Bureau of Research and Development Royal Irrigation Department Thailand +662 583 5011 thanar2810@gmail.com
4.		Name Designation Department Contact no. Email	Mr. Sakpinit Pradungkij Senior Expert on Environment Impact Royal Irrigation Department Thailand +662 241 2363
5.		Name Designation Department Contact no. Email	Mr. Prinya Kamolsin Expert on Irrigation (Hydraulic Engineering) Royal Irrigation Department +668-4874-6074 p_kamolsin@mail.rid.go.th

APPENDIX A

THE 35TH MEETING OF THAILAND - MALAYSIA JOINT TECHNICAL WORKING GROUP (JTWG) ON THE GOLOK RIVER MOUTH IMPROVEMENT PROJECT

LIST OF THAI DELEGATES

6.		Name Designation Department Contact no. Email	Mr. Chalermchai Treenarin Director Narathiwat Provincial Irrigation Project Royal Irrigation Department Thailand +667 351-1485 clc_treenarin@yahoo.com
7.		Name Designation Department Contact no. Email	Mr. Chaiwut Wattanakarn Director, Hydrology Irrigation Center (Southern Region), Irrigation Department +667-461-1679 chaiwutrid@gmail.com
8.		Name Designation Department Contact no. Email	Mr. Sompit Pongchaikung Expert on Civil Engineer, Royal Irrigation Department +662 241 7563 rid108@hotmail.com
9.		Name Designation Department Contact no. Email	Mr. Arthon Suttigarn Director, Project Planning Division 4 Office of Project Management Royal Irrigation Department Thailand +662 241 2680
10.		Name Designation Department Contact no. Email	Commander Siriwat Siriwatanakul Representative Hydrographic Department, Royal Thai Navy +662 475 7017
11.		Name Designation Department Contact no. Email	Major Putipong Kanjanapadit 4th Forth Army Area, Royal Thai Army +6692 961 6529

APPENDIX A

THE 35TH MEETING OF THAILAND - MALAYSIA JOINT TECHNICAL WORKING GROUP (JTWG) ON THE GOLOK RIVER MOUTH IMPROVEMENT PROJECT



LIST OF THAI DELEGATES

12.		Name Designation Department Contact no. Email	Ms. Pimpida Ravirat Thanarat First Secretary Department of Treaties and Legal Affairs Ministry of Foreign Affairs +662 203 5000 ext. 11027
13.		Name Designation Department Contact no. Email	Mr. Pacharawat Phueakkhao Hydrologist Marine Department +662 2331311 ext 291
14.		Name Designation Department Contact no. Email	Ms. Manassanan Chotejirabhirom Policy and Plan Analyst Ministry of Agriculture and Cooperatives +662 281 9308 positivemck@gmail.com
15.		Name Designation Department Contact no. Email	Mrs. Thayida Siritreeratormrong Van Corstanje Chief of Foreign Activity Coordinating Branch Office of Project Management Royal Irrigation Department Thailand +66 85137 0212 thayida@gmail.com
16.		Name Designation Department Contact no. Email	Mr. Attapan Diloksoyon Civil Engineer, Professional Level Bureau of Project Management Royal Irrigation Department Thailand +66 80 270 9997 atdplk@gmail.com
17.		Name Designation Department Contact no. Email	Mr. Piriya Thumyago Foreign Relation Officer, Practitioner Level Bureau of Project Management Royal Irrigation Department Thailand +6690 527 5545 piriya_rid@yahoo.com

APPENDIX A

THE 35TH MEETING OF THAILAND - MALAYSIA JOINT TECHNICAL WORKING GROUP (JTWG) ON THE GOLOK RIVER MOUTH IMPROVEMENT PROJECT

LIST OF THAI DELEGATES

18.		Name Designation Department Contact no. Email	Mr. Wasin Phutphat Irrigation Engineer, Practitioner Level Bureau of Project Management Royal Irrigation Department Thailand +662 241 2363
19.		Name Designation Department Contact no. Email	Ms. Latan Chaipreukkul Foreign Relation Officer, Practitioner Level Office of Project Management Royal Irrigation Department +662 241 2363 latan.c.c@gmail.com

APPENDIX A

THE 35TH MEETING OF THAILAND - MALAYSIA JOINT TECHNICAL WORKING GROUP (JTWG) ON THE GOLOK RIVER MOUTH IMPROVEMENT PROJECT

LIST OF MALAYSIAN DELEGATES

1.		Name Designation Department Contact no. Email	Dato' Ir. Dr. Haji Md. Nasir bin Md. Noh Deputy Director General Department of Irrigation and Drainage Malaysia +6019 2333716 drnasir@water.gov.my
2.		Name Designation Department Contact no. Email	Mr. Mohd Sor bin Othman Deputy Director Division of Coastal Zone Management Department of Irrigation and Drainage Malaysia +6019 2333720 msor@water.gov.my
3.		Name Designation Department Contact no. Email	Mr. Hanizan bin Deraman Senior Engineer Department of Irrigation and Drainage Kelantan +6019 9326324 hanidra@water.gov.my
4.		Name Designation Department Contact no. Email	Mr. Mohd Taufik Bin Mohd @Mohd Yusoff Senior Federal Counsel Attorney General's Chambers of Malaysia +6019 4857071 m_taufik@agc.goc.my
5.		Name Designation Department Contact no. Email	Mr. Khairunnizam bin Mohammad Ideres Senior Federal Counsel Attorney General's Chambers of Malaysia +6019 5558009 khairunnizam@agc.goc.my
6.		Name Designation Department Contact no. Email	Mr. Kahadi bin Hassan Deputy Director (Technical) Federal Development Department of Kelantan Implementation Coordination Unit Prime Minister's Department Malaysia +6019 9375757 kahadi.hassan@kel.icu.gov.my

APPENDIX A

THE 35TH MEETING OF THAILAND - MALAYSIA JOINT TECHNICAL WORKING GROUP (JTWG) ON THE GOLOK RIVER MOUTH IMPROVEMENT PROJECT

LIST OF MALAYSIAN DELEGATES

7.		Name Designation Department Contact no. Email	Mr. Wan Ahmad Suwaidi Bin Zainal Abidin Principal Assistant Director Kelantan Economic Planning Unit +6019 9055585 suwaidi@kelantan.gov.my
8.		Name Designation Department Contact no. Email	Mr. Arumugam Subramaniam Principal Assistant Director Marine Department Malaysia +6012 2962444 arumugam@marine.gov.my
9.		Name Designation Department Contact no. Email	Mr. Mohd Hafiz Bin Mat Aripin Assistant Director of Survey Boundary Affair Division Survey and Mapping Department Malaysia +6019 9677369 mohdhafiz@jupem.gov.my
10.		Name Designation Department Contact no. Email	Mr. Mohd Eizam bin Yusof Engineer Division of Water Resources Management and Hydrology Department of Irrigation and Drainage Malaysia +6016 4844359 eizam@water.gov.my
11.		Name Designation Department Contact no. Email	Mr. Ahmad Ikhwan bin Abdul Wahid Engineer Division of Coastal Zone Management Department of Irrigation and Drainage Malaysia +6013 6093085 ahmadikhwan@water.gov.my
12.		Name Designation Department Contact no. Email	Ms. Carine Wong Koh Yin Engineer Division of Coastal Zone Management Department of Irrigation and Drainage Malaysia +6012 2198032 carine@water.gov.my

APPENDIX B

THE 35TH MEETING OF THAILAND - MALAYSIA JOINT TECHNICAL WORKING GROUP (JTWG) ON THE GOLOK RIVER MOUTH IMPROVEMENT PROJECT

AGENDA

AGENDA 1: OPENING SESSION

AGENDA 2: MATTERS FOR INFORMATION

- 2.1 MONITORING AND EVALUATION OF GOLOK RIVER MOUTH
- 2.2 MAINTENANCE DREDGING OF GOLOK RIVER MOUTH
- 2.3 PROTECTION WORK AT TRANSIT POINT B
- 2.4 REHABILITATION AND PROTECTION WORKS AT GOLOK RIVER MOUTH
- 2.5 MUTUAL CALIBRATION OF RATING CURVE AT CABLEWAY STATION
- 2.6 REAL TIME MONITORING SYSTEM AND THE JOINT WEBSITE FOR GOLOK RIVER BASIN

AGENDA 3: OTHER MATTERS

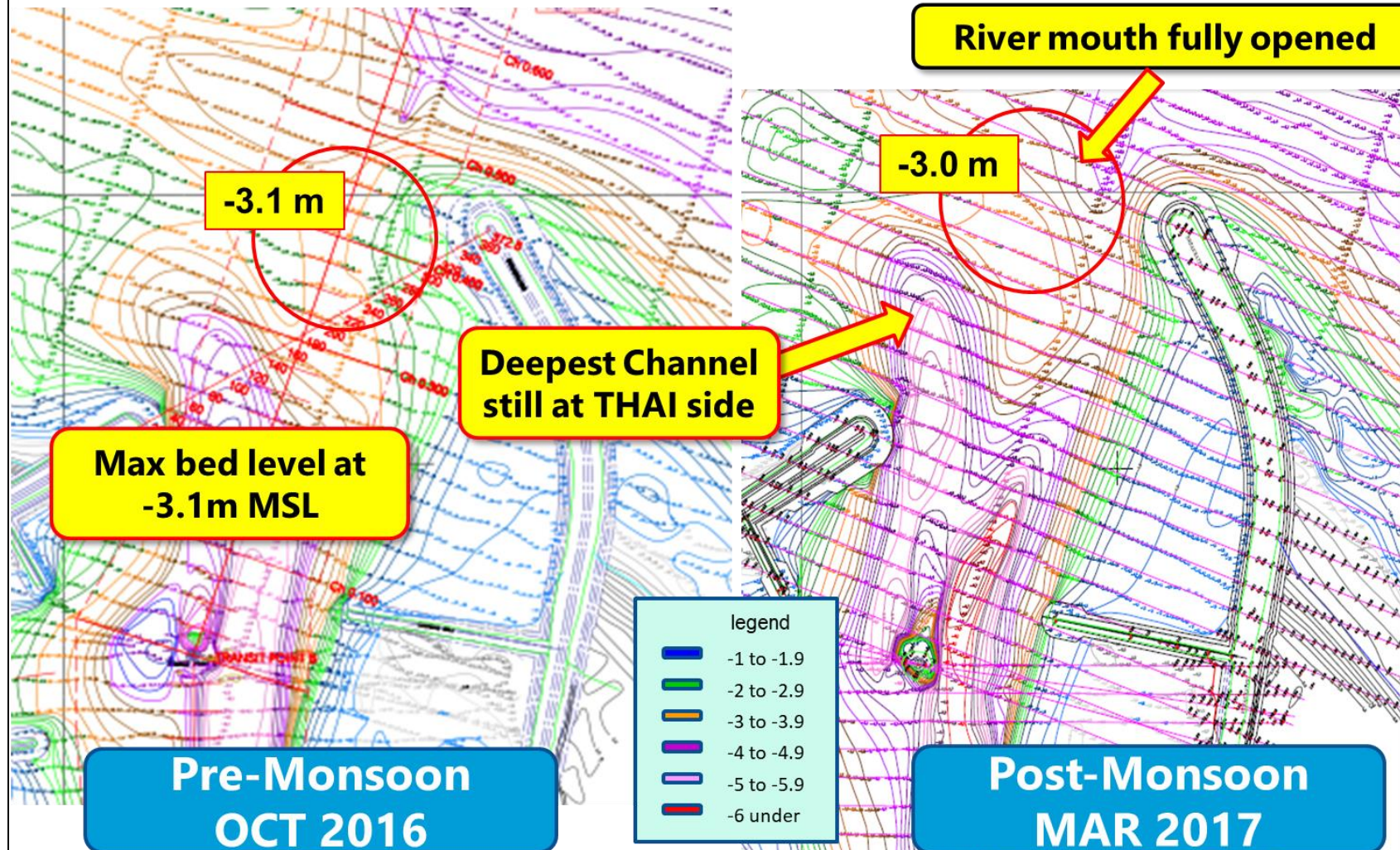
- 3.1 INTEGRATED RIVER BASIN MANAGEMENT (IRBM) PLAN FOR GOLOK RIVER
- 3.2 ROAD MAP FOR JOINT IMPLEMENTATION WORKS
- 3.3 DATE AND VENUE FOR NEXT MEETING

AGENDA 4: MATTERS TO BE REFERRED TO JSC

AGENDA 5: ADOPTION OF MINUTES OF MEETING

Monitoring and Evaluation of Golok River Mouth

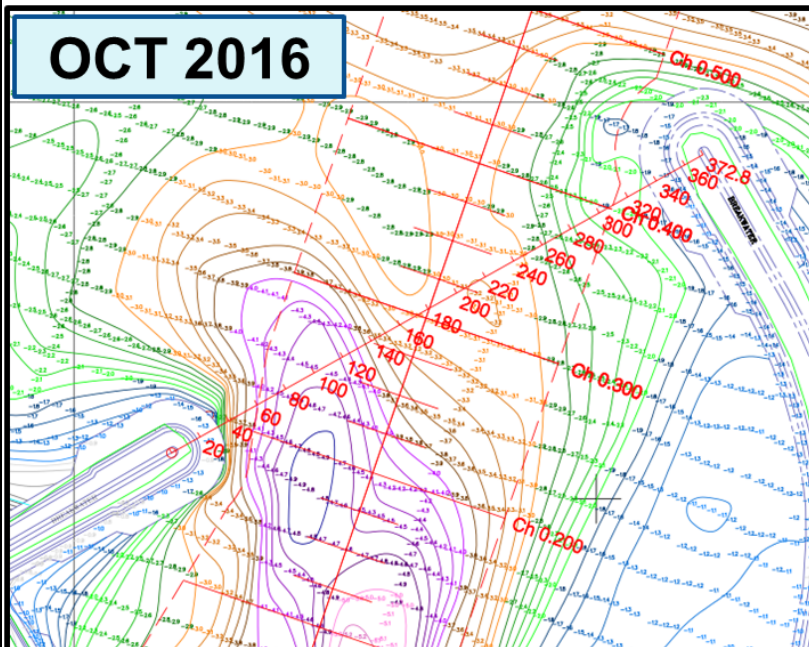
The sea bed level is increased from -3.1 m MSL to -3.0 m MSL



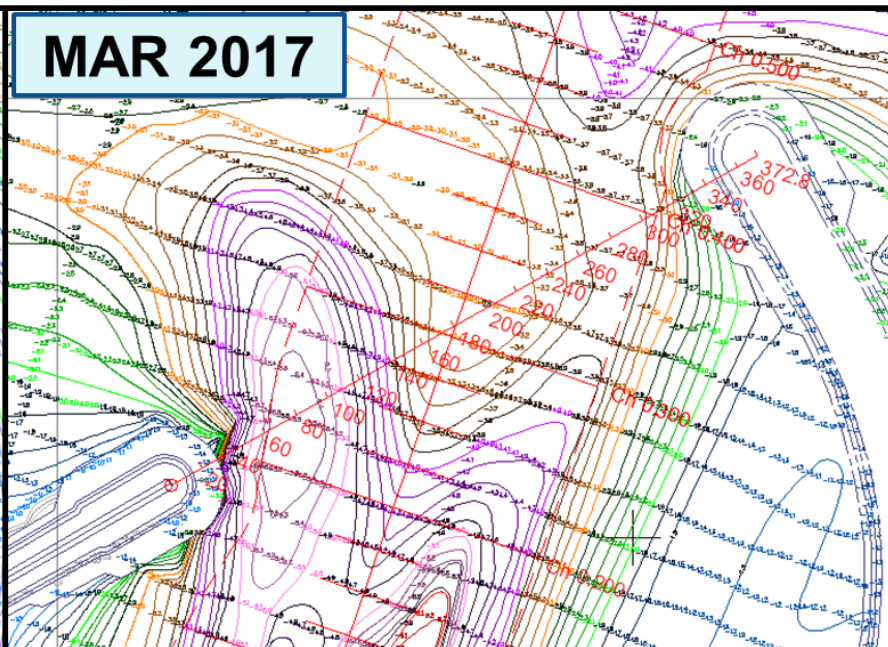
Q max 396 m³/s @ Cableway station 3 JAN 2017; Design bed level: -3m Thai MSL by SMEC

Maintenance Dredging of Golok River Mouth

OCT 2016



MAR 2017



Pre OCT 16 Cutting Area 39.8 m²

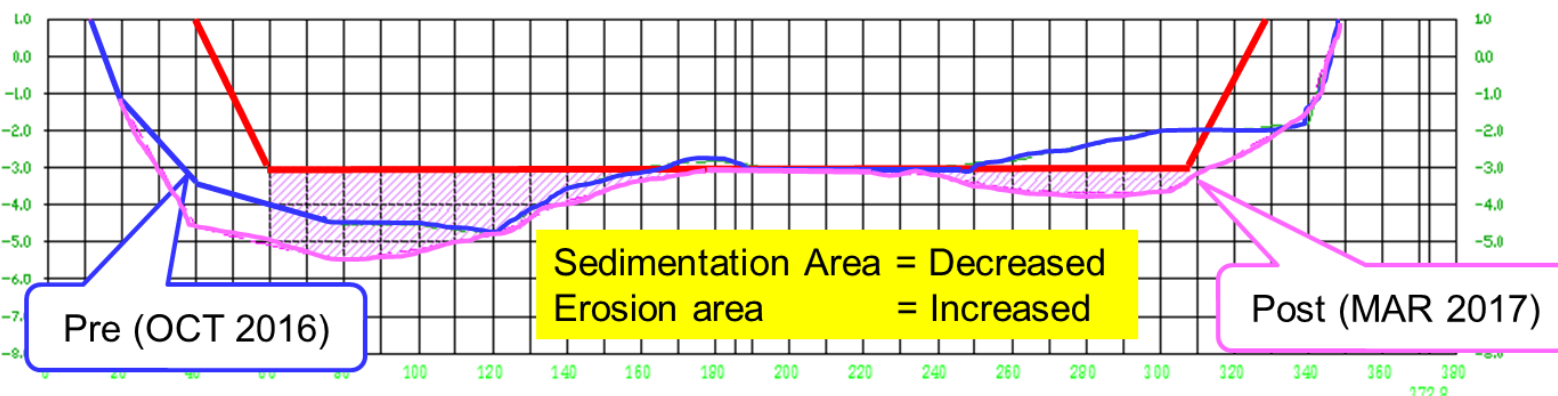
Erosion Area = 120.3 m²

Post MAR 17 Cutting Area 0.0 m²

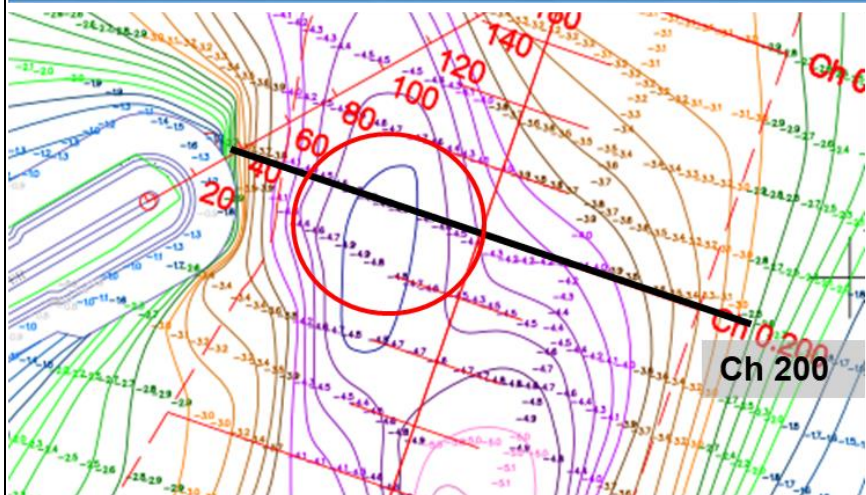
Erosion Area = 220.0 m²

THAILAND

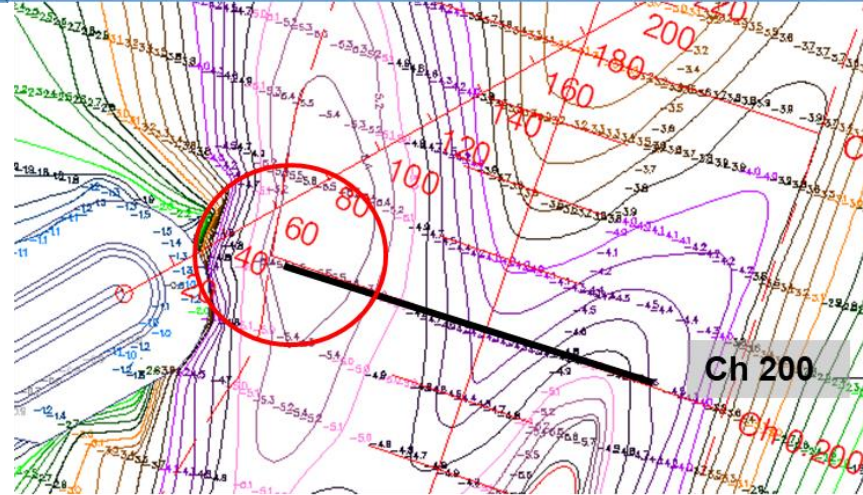
MALAYSIA



Pre-Monsoon Oct 2016



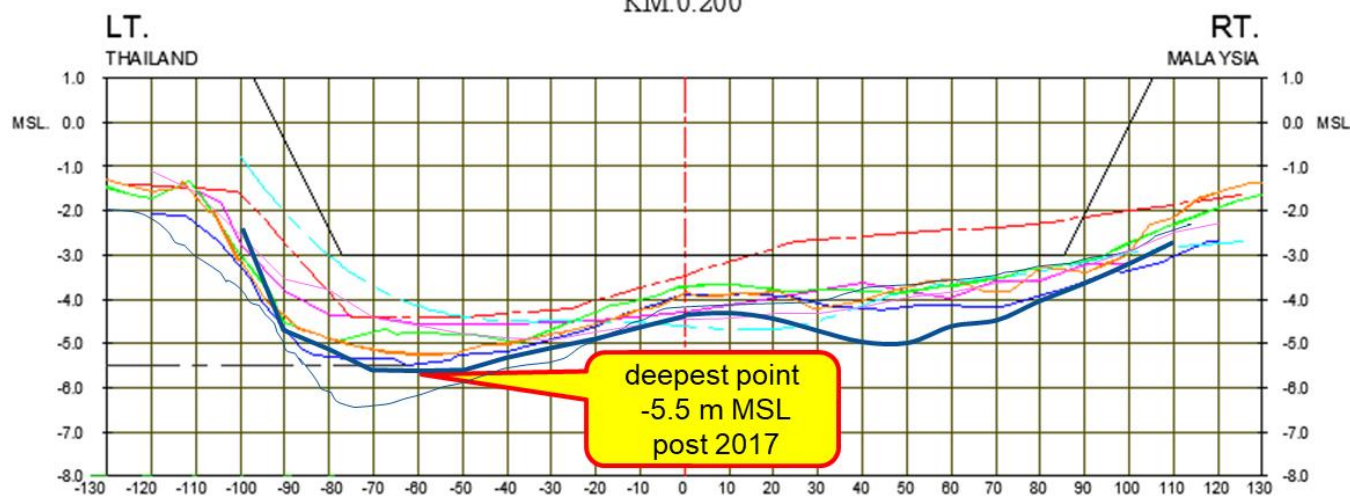
Post-Monsoon Mar 2017



EROSION AT THAI BREAKWATER

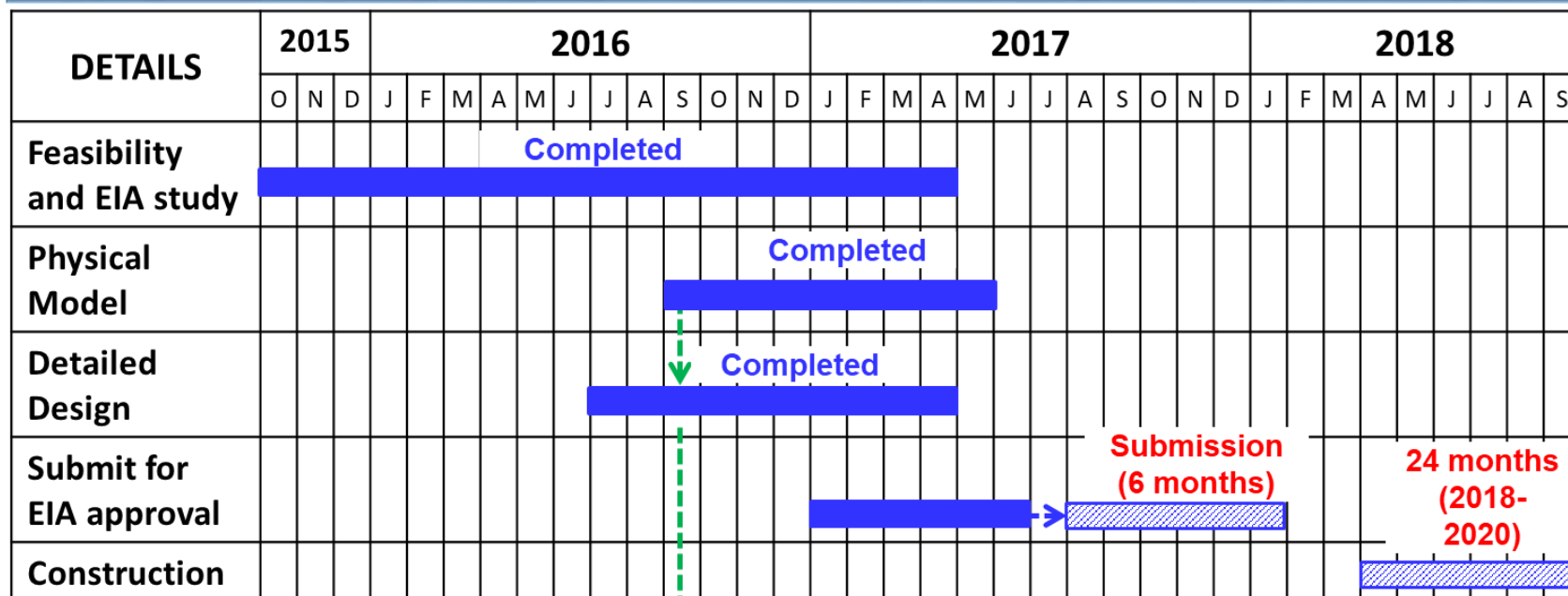
COMPARED PRE-POST @ CH 0+200

KM.0.200



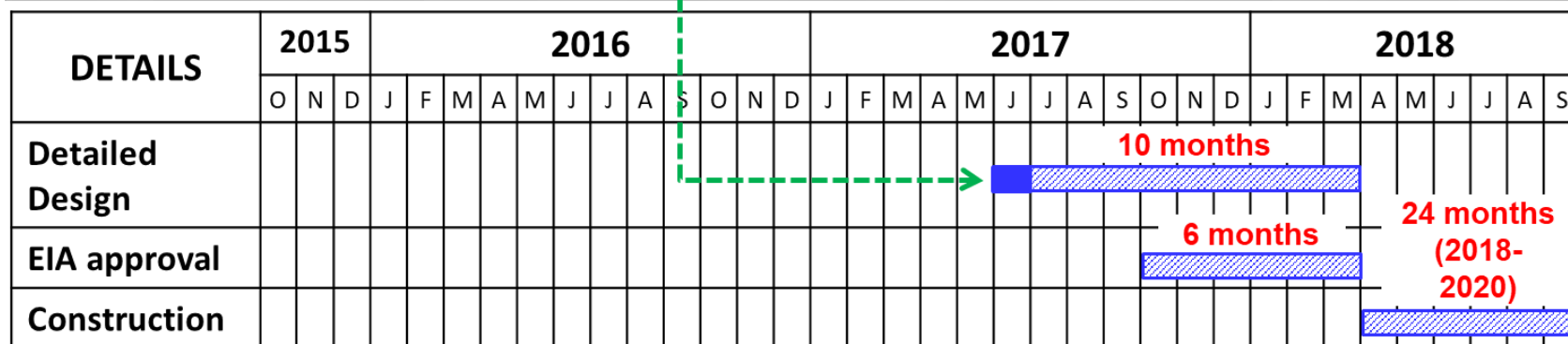
Season	Max Depth m MSL
PRE 2011	-4.69
POST 2012	-4.40
PRE 2013	-5.50
POST 2014	-4.56
PRE 2014	-4.95
POST 2015	-5.24
PRE 2015	-6.30
POST 2016	-6.20
PRE 2016	-4.90
POST 2017	-5.50

EIA road map (THAI side)



Input for detailed design

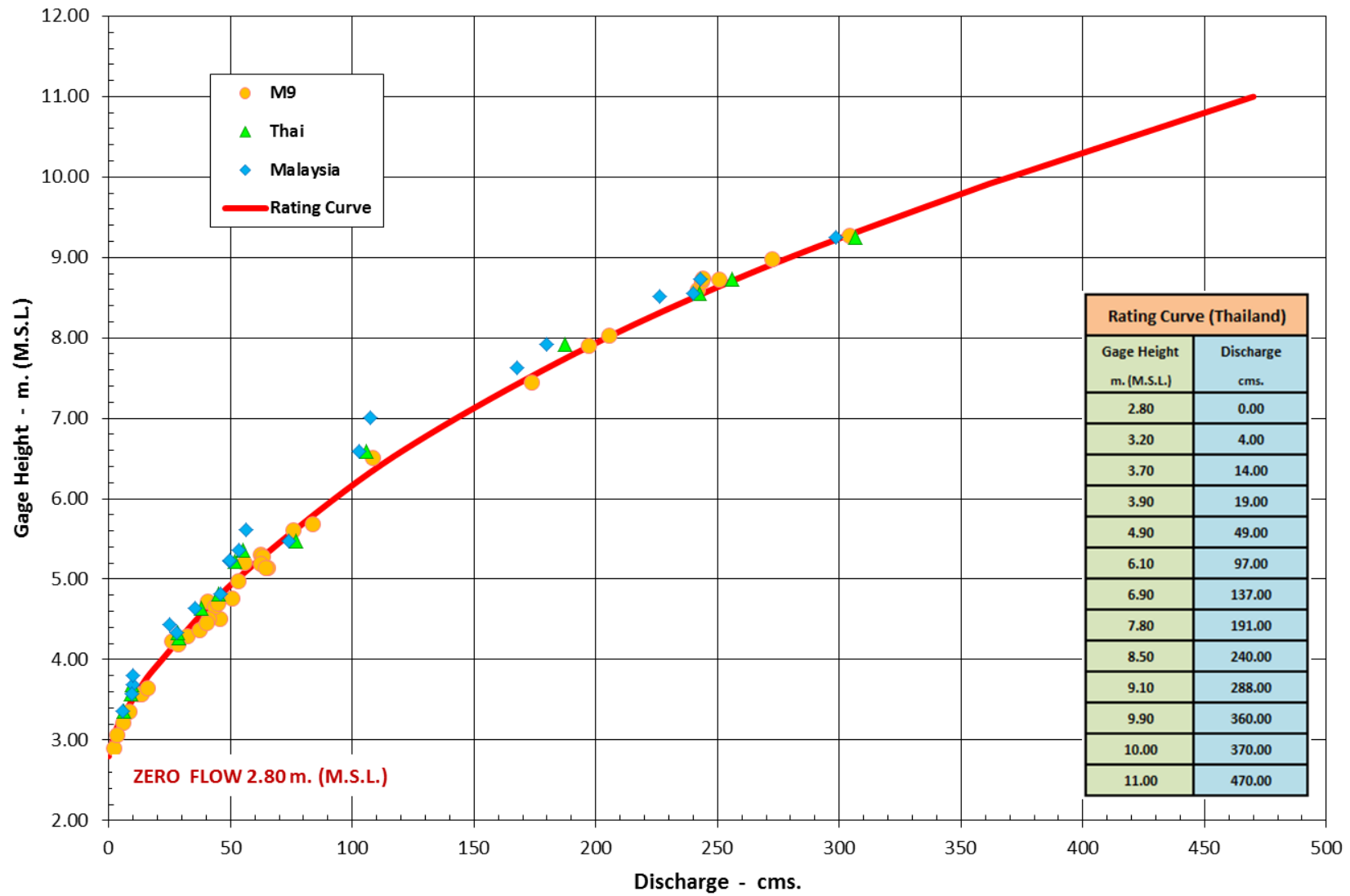
Detailed design road map (MALAYSIAN side)



APPENDIX G

Mutual Gauging 2016 and 2017				
Date	Level (m)	Discharge, Q (m³/s)	Area, A (m²)	Velocity, V (m/s)
28-Jan-16 (11am)	7.63	168.507	224.15	0.752
28-Jan-16 (3pm)	7.93	290.844	243.62	1.194
29-Feb-16	4.4	33.743	81.254	0.415
24-Mar-16	3.36	5.964	44.116	0.135
28-Apr-16	2.88	1.097	11.159	0.098
25-May-16	3.03	3.462	37.476	0.092
26-Jun-16	3.66	13.00	53.158	0.245
27-Jun-16	5.5	32.01	84.579	0.378
28-Jul-16	5.26	57.257	111.788	0.512
18-Aug-16	4.62	11.528	51.41	0.224
26-Sep-16	3.66	13.00	53.158	0.245
27-Oct-16	4.41	31.588	77.393	0.408
21-Nov-16	6.24	56.34	108.782	0.518
22-Dec-16	8.93	217.605	274.829	0.792
25-Jan-17	8.99	268.314	304.19	0.882
22-Feb-17	4.75	28.682	86.61	0.331
30-Mar-17	4.14	21.67	68.082	0.318



**MUTUAL RATING CURVE (WATER YEAR 2015-2016) AT STATION X.119A
GOLOK RIVER AT BAN LAN-TU , SU-NGAI KOLOK , NARATHIWAT**





Progress of New Telemetry Station

ACTIVITIES	2016							2017							2018
	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MEI	JUN	JULY	JULY
Setup			Completed												
				Completed											
Testing on data collection			Completed												
					Completed										
Calibration						Completed									
							Completed								
Data sharing													Only Rainfall		Rainfall + Water Level
													Only Rainfall		Rainfall + Water Level

Note:

 Progress (Thailand)
 Planning (Thailand)

Note:

 Progress (Malaysia)
 Planning (Malaysia)

Road Map for Joint Implementation Works

