

**d) Final Report, Detailed Design Drawings
and Tender Document**


THE REHABILITATION PROJECT
OF THE OUTER BANGKOK RING ROAD
IN THE KINGDOM OF THAILAND


MINUTES OF DISCUSSIONS
FOR
THE FINAL REPORT, THE DETAILED DESIGN, AND THE TENDER DOCUMENT


According to the Discussion for the Minutes of Meetings on the Preparatory Survey on “The Rehabilitation Project of the Outer Bangkok Ring Road” (hereinafter to as “the Project”) on August 29, 2012, JICA Survey Team summarized the comments of Department of Highways (hereinafter referred to as “DOH”) to the final report, the detailed design and the tender documents, and mentioned arrangements to each comments on the attached sheets.


As a result of the discussions, both sides confirmed the items described on the attached sheets.

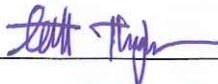
Bangkok, September 24, 2012



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SUMMARY OF DISCUSSION & AGREEMENT (1/11)

【August 16th 2012 ~ August 28th 2012】

DOH : Department of Highways
JST : JICA Study Team

No.	Date	Discussion with Bureau / Division of	Subjects	Contents of Discussion	Agreements	Final Detailed Design	Organization / Position	Signature
1	August 16 th	<ul style="list-style-type: none"> International Highways Cooperation Location and Design Materials Analysis and Inspection Inter-City Motorways Division Inter-City Motorways Maintenance District 	<p>[Working Team Meeting]</p> <p>1-1. DOH comments on Detailed Design Drawings</p>	<ul style="list-style-type: none"> Applying the drawing authorization format from Bureau of Location and Design. DOH working team has requested JST(JICA Study team) to respond and revise the drawings in accordance with issued comments. <ul style="list-style-type: none"> Reusing of existing concrete barrier Using of temporary plastic barrier Retaining wall stability Superelevation Cement treated crush rock base 	<ul style="list-style-type: none"> JST informed that drawing authorization format has already been used. JST responds against to DOH comments, and will revise them if necessary. 	<ul style="list-style-type: none"> JST applied the drawing format of Bureau of Location and Design. JST revised the detailed design drawings in accordance with DOH comments based on result of technical discussion. 		
2	August 21 st	<ul style="list-style-type: none"> Deputy Director General International Highways Cooperation Location and Design Materials Analysis and Inspection Inter-City Motorways Maintenance District Inter-City Motorways Division Planning Highways Construction 2 Office of Environment and Public Involvement 	<p>[Committee Meeting]</p> <p>2-1. Confirmation of Project Schedule</p>	<p>2-1. JST explained the timeframe of the Project as follows;</p> <p>Timeframe 30 May 2012 Technical Note signing 31 July 2012 Consultant team submit the detailed design drawings 16 Aug 2012 DOH working team review the detailed design drawings 21 Aug 2012 DOH Committee review the detailed design drawings 31 Aug 2012 Consultant team submit the Draft Final Report, with detailed design drawings and tender document Mid of Oct 2012 Invitation for Tendering Mid-December 2012 Bidding End of Dec 2012 Contract signing January 2013 Construction Commencement</p>	<p>2-1. Both side agreed.</p>	<ul style="list-style-type: none"> The time frame of the Project mentioned in the left column will be applied. 		

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SUMMARY OF DISCUSSION & AGREEMENT (2/11)

【August 16th 2012 ~ August 28th 2012】

DOH : Department of Highways
JST : JICA Study Team

No.	Date	Discussion with Bureau / Division of	Subjects	Contents of Discussion	Agreements	Final Detailed Design	Organization / Position	Signature
2	August 21 st		2-2: Explanation of outline of this project	<p>2-2. Outline of the Project Rehabilitation of Outer Ring Road No.9 (East Portion) on North bound which total length is 15.056 km. The objective section in this Project is from Sta. 10+600 to Sta.29+200. The road level will be raised to secure transportation on northbound even if the same scale of flooding in year 2011 occurs. Policy of raising is as follows;</p> <p>Plan 1: Raising of existing road to the level of -20 cm from the highest flood marks based on year 2011 data</p> <p>Plan 2: Raising of existing road to the level of +10 cm. from the highest flood marks based on year 2011 data; from Sta.24+400 to Sta.25+600 (around Thanayaburi toll gate), the length is 1,200 km.</p>	2-2. Both side agreed.	2-2. The outline of the Project has been already applied.	-	-
			2-3: Follow-up of last Committee meeting regarding Toll Gate Area	<p>2-3.1 Toll gate rehabilitation JST plans to apply modified asphalt concrete and concrete pavements for the toll gate area. The length of the concrete pavement from the toll gate is at 55 m. (2 lanes on the left side reserved especially for heavy trucks). For this, the Committee has requested to JST to increase the length of concrete pavement from 55 m. to 80 m. at the entering side to toll plaza due to matching to the toll gates of the other motor way.</p> <p>2-3.2 Traffic management during construction JST has submitted the traffic management plan and asked to check it.</p> <p>2-3.3 Toll fee collection for the Contractor and JICA agencies JST has notified the Committee that they will not require (apply for) toll fee exemption.</p> <p>2-3.4 Vertical clearance of pedestrian overpass JST has explained the Committee that in terms of vertical clearance, overhead crossing facility to be affected by raising road elevation is only pedestrian overpass near the toll gate. As a result, JST designed to secure vertical clearance of only the pedestrian overpass.</p>	2-3.1 JST agreed. 2-3.2 DOH agreed. 2-3.3 DOH agreed. 2-3.4 DOH agreed.	2-3.1 The concrete pavement length will be revised to 80m from 55m. 2-3.2 DOH (Bureau of Location and Design.) replied there are no comments on 23 rd Aug. 2-3.3 Toll fee will be collected from the Contractor and JICA agencies. 2-3.4 Vertical clearance of the pedestrian overpass mentioned in the left column is secured in accordance with DOH standard.	-	-

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SUMMARY OF DISCUSSION & AGREEMENT (3/11)

[August 16th 2012 ~ August 28th 2012]

DOH : Department of Highways
JST : JICA Study Team

No.	Date	Discussion with Bureau / Division of	Subjects	Contents of Discussion	Agreements	Final Detailed Design	Organization / Position	Signature
2	August 27 st		2-4. Detailed Design Drawings Review	<p>2-4.1 Super-elevation The Committee requested the design of super-elevation shall be conformed to DOH standard. JST explained super elevation has been designed by AASHTO standard, as it is close to DOH standard. The Committee requested JST to have a further discussion with the Bureau of Location and Design in order to finalize the applicable design standard.</p> <p>2-4.2 Traffic management plan during construction The Committee asked JST to propose the traffic management plan during construction. JST explained that during construction there will be three (3) traffic lanes on each bounds (northbound and southbound), which the plans will be submitted to DOH. The toll gate has been opened for both sides, six (6) booths for each bound with at least one (1) booth for heavy trucks.</p> <p>2-4.3 Drainage in the center median As a response against the comment from DOH technical meeting, JST has informed the Committee that the V-shaped ditch lining has already been designed for better run-off.</p> <p>2-4.4 Substitution of temporary barriers The Committee asked for the substitution of temporary concrete barriers with plastic barriers considering difficulty of securing the storage yards and reusing them to the other project or road because of handling. JST explained that concrete barrier must be applied from safety standpoint as a safety facility on the motor way. This kind of facility is required having proper strength and weight. The Committee has asked the Inter-city Motorways Maintenance District to find the proper storage place for these barriers, and also requested to JST to re-design the temporary concrete barriers considering easy handling for transportation.</p> <p>2-4.5 Application for the Cement Treated Base Considering the Base Course design, the Committee asked JST to apply the Cement Treated Base as of existing condition. JST proposed Crushed Rock Base design can be accepted because of no structural issue.</p>	<p>2-4.1 JST will discuss with Bureau of Location and Design.</p> <p>2-4.2 DOH agreed.</p> <p>2-4.3 DOH agreed.</p> <p>2-4.4 Both side agreed to deal with handling issue of temporary concrete barrier.</p> <p>2-4.5 DOH agreed with application of Crushed Rock Base.</p>	<p>2-4.1 Super-elevation has been applied according to DOH standard through the technical discussion between JST and Bureau of Location and Design on 23rd Aug. 2012.</p> <p>2-4.2 During construction three traffic lanes will be opened on each direction. In terms of toll gate will be opened for both sides in the construction stage.</p> <p>2-4.3 The detailed design drawings will be revised.</p> <p>2-4.4 To deal with the issue, it will be clearly indicated in the Technical Specification that the Contractor shall prepare and submit shop drawing of temporary concrete barrier with such method as hole for easy handling. The Consultant will approve it.</p> <p>2-4.5 Crush Rock Base design is adopted, rather than cement Treated base course.</p>	-	-

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SUMMARY OF DISCUSSION & AGREEMENT (4/11)

【August 16th 2012 ~ August 28th 2012】

DOH : Department of Highways
JST : JICA Study Team

No.	Date	Discussion with Bureau / Division of	Subjects	Contents of Discussion	Agreements	Final Detailed Design	Organization / Position	Signature
2	August 21 st			<p>2-4.6 Consolidation Settlement The Committee has asked JST to consider the road settlement at the toll gate area due to high volume embankment. JST explained that JST does not plan any countermeasures for consolidation settlement because this project is urgent restoration rehabilitation, and constraint of short work duration and limited budget. JTS mentioned the prospected settlement value is about 20cm at toll gate area and about 5 to 7cm at another section in 10 years.</p> <p>2-4.7 Stability of designed retaining wall The Committee has asked JST to review the stability of designed retaining wall and report to in charge divisions.</p>	<p>2-4.6 JST will inform JICA of requirement of measures for consolidation settlement from DOH.</p> <p>2-4.7 JST agreed.</p>	<p>2-4.6 The result of settlement analysis will indicate in the final report. The responsibility of both side including the detect period shall be discussed in the further discussion.</p> <p>2-4.7 JST submitted result of stability analysis to DOH on 28th August 2012.</p>	-	-
3	August 23 rd	<ul style="list-style-type: none"> International Highways Cooperation Location and Design 	<p>3-1. Detailed Design Drawings (2nd)</p>	<p>2-4.8 The authorization for the detailed design drawings The Committee has decided to put signatures of DOH Engineer, Direct of Bureau of Location and Design, and Chief Engineer for Location and Design, into the project location map drawing only, in order to approve it.</p> <p>3-1.1 Possibility of changing lane numbers of toll gate for toll fee collection considering the rush hours JST explained to DOH indicating the traffic volume data at objective toll gate, that traffic volume of both directions is nearly same in all day with LOS is A.</p> <p>3-1.2 Super-elevation JST showed comparison sheet of difference of values between AASHTO and DOH standard and explained modified drawings following DOH standard.</p>	<p>2-4.8 JST agreed.</p> <p>3-1.1 DOH agreed that the changing lane numbers of toll gate is not required.</p> <p>3-1.2 JST agreed to correct the super-elevation at the curve section in accordance with DOH standard.</p>	<p>2-4.8 Along with the signature of the DOH representative on the project location map drawing, initial of the engineer will be additionally put into each drawing.</p> <p>3-1.1 During construction three traffic lanes will be opened on each direction. In terms of toll gate will be opened for both sides in the construction stage.</p> <p>3-1.2 The detailed design drawings will be revised.</p>	-	-

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SUMMARY OF DISCUSSION & AGREEMENT (5/11)

【August 16th 2012 ~ August 28th 2012】

DOH : Department of Highways
JST : JICA Study Team

No.	Date	Discussion with Bureau / Division of	Subjects	Contents of Discussion	Agreements	Final Detailed Design	Organization / Position	Signature
3	August 23 rd			<p>3-1.3 Traffic Management The proposed traffic management drawings during construction stage have been accepted by DOH representatives. DOH also requested to JST to make 15m length opening at 500m interval for emergency situation.</p> <p>3-1.4 Applying of modify asphalt concrete This subject shall be discussed with Bureau of Material Analysis and Inspection.</p> <p>3-1.5 Consolidation settlement JST informed DOH that additional boring will be conducted to review the result of prior consolidation settlement analysis.</p> <p>3-1.6 Stability of retaining wall JST requested to DOH to provide specific data for stability calculation for retaining wall.</p> <p>3-1.7 Further comment for Design All of technical discussion has been completed in this meeting. Any further comments will not be issued from DOH. DOH mentioned that Director of Bureau of Location and Design, and Chief Engineer for Location and Design will be signed the detailed design drawing to authorize the drawings and for tender document.</p>	<p>3-1.3 DOH agreed proposed traffic management plan during construction stage. JST agreed that 15m length opening at 500m interval for emergency situation will be applied. It will be shown in typical cross section.</p> <p>3-1.4 JST agreed.</p> <p>3-1.5 DOH agreed.</p> <p>3-1.6 Both side agreed that any well-known methodology and formula can be applicable for the calculation. JST will submit the calculation to DOH.</p> <p>3-1.7 Both side agreed with no more discussion regarding to detailed design.</p>	<p>3-1.3 The detailed design drawings will be revised.</p> <p>3-1.4 Further Discussion will be held on 27 August 2012.</p> <p>3-1.5 On-going</p> <p>3-1.6 JST submitted result of stability analysis to DOH on 29th August 2012.</p> <p>3-1.7 Technical issues related to detailed design is completed on this day.</p>	-	-

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SUMMARY OF DISCUSSION & AGREEMENT (6/11)

APPENDIX 1

【August 16th 2012 ~ August 28th 2012】

DOH : Department of Highways
JST : JICA Study Team



No.	Date	Discussion with Bureau / Division of	Subjects	Contents of Discussion	Agreements	Final Detailed Design	Organization / Position	Signature
3	August 23 rd			<p>3-1.8 Drawings of tender document DOH informed JST that A1 size will be used for signature, A3 will be used for tender documents. DOH will sign on only one page under the project location map.</p> <p>3-1.9 Limit speed of diversion road during construction stage DOH recognized the design speed of diversion road is 80km/h. However it will be restricted the speed limit by 60km/h for them. The speed limit sign board shall be installed.</p> <p>3-1.10 The insurance in case of accident or damage caused by construction Contractor has to enter the insurance which will cover traffic accidents of third parties.</p>	<p>3-1.8 JST agreed.</p> <p>3-1.9 Both side agreed.</p>	<p>3-1.8 For the tender documents, signature must be put into every page of the detailed drawing, that is A1 size, because of Japanese Grant Aid System.</p> <p>3-1.9 The detailed design drawings will be revised.</p> <p>3-1.10 The insurance in case of accident or damage caused by construction is indicated in the tender documents.</p>	-	-
4	August 24 th	Materials Analysis and Inspection	4-1. Detailed Design Drawings (3rd)	<p>4-1.1 Application of Modified Asphalt Concrete JST proposed the changing of wearing course design of normal section from modified asphalt concrete to normal asphaltic concrete, except one heavy truck lane on the left side of the objective road. The DOH Bureau of Materials Analysis and Inspection's representative requested to apply modified asphalt concrete for two lanes on the left considering heavy vehicle, one more additional lane from JTS's proposal.</p> <p>4-1.2 Consolidation Settlement JTS explained a possibility of occurring consolidation settlement based on result of analysis, and countermeasures for consolidation settlement will not be provided as well. At the toll gate area, even if -20 cm consolidation settlement, which the analysis led to, will be occurred, inundation height is -10cm. Therefore, it will not affect the vehicles passing on the objective road. However, to conduct the more accurate analysis, JST will carry out the additional boring investigation under the carriage way.</p>	<p>4-1.1 Both side agreed to provide wearing course surface, for the normal section, as normal asphalt concrete for two inner lanes and shoulders, and modified asphalt concrete for two outer lanes. DOH Bureau of Material Analysis and Inspection's representative will report this conclusion to his Bureau's Director accordingly.</p> <p>4-1.2 Both sides agreed, and JST will provide into the final report the consolidation settlement calculation based on the additional boring investigation. If there are any comments for JST's proposal after confirming with Director of Bureau of Materials Analysis and Inspection, DOH will inform or ask to JST.</p>	<p>4-1.1 The detailed design drawings will be revised.</p> <p>4-1.2 The result of the settlement analysis will be indicated in the final report. The responsibility of both sides for consolidation settlement shall be further discussed.</p>	-	-

SUMMARY OF DISCUSSION & AGREEMENT (7/11)

[August 16th 2012 ~ August 28th 2012]

DOH : Department of Highways
JST : JICA Study Team

No.	Date	Discussion with Bureau / Division of	Subjects	Contents of Discussion	Agreements	Final Detailed Design	Organization / Position	Signature
4	August 24 th			4-1.3 Stability of retaining wall DOH confirmed that they don't have any specific standard methodology or formula regarding to the stability. Therefore, JST will prepare the stability formula by using well-known method. DOH requested that 1.5 as the Safety Factor is applied.	4-1.3 JST agreed to calculate retaining wall stability by using the well-known method and submit its result to Bureau of Materials Analysis and Inspection.	4-1.3 JST submitted result of stability analysis to DOH on 29 th August 2012.	-	-
5	August 27 th	Materials Analysis and Inspection	5-1. Applying Modify asphalt concrete	5-1.1 Comment for the meeting held on August 24 th The representative confirmed that there is no objection from DOH Director of Bureau of Materials Analysis and Inspection, one of DOH Committee. (The consideration of pavement design is a responsibility of Bureau of Materials Analysis and Inspection)	5-1.1 Both side agreed	5-1.1 The detail design drawing will be revised.	-	-
6	August 28 th	[DOH] Mr. Chayatan Phromsorn <i>Director of Bureau of International Highways Cooperation</i> Mr. Punya Chupanit <i>Director of Management Group, Bureau of International Highways Cooperation</i> Ms. Manikka Nuankerd <i>Director of Foreign Relations Group, Bureau of International Highways Cooperation</i>	6-1. Contents of Minutes	[Summary] JICA explained contents of draft final Minutes, and JICA and DOH discussed. 6-1.1 Shrinkages for Work Duration Annex 2: Tentative Implementation Schedule DOH requested to shrink the work duration from 20 months to 18 month. For this requirement, JICA especially gave the explanation of the project background to the argument about design, and answered not to be able to justify it at that moment. 6-1.2 Minutes (Item 5-10) 5-10 To obtain necessary permits to allow the construction vehicle and equipment to enter and exit the motorway DOH requested to delete this item. 6-1.3 Minutes (Item 6) 6. Project cost estimation borne by Thai side Thai side understood on the project cost borne by Thai side described in Annex-3. DOH pointed out unnecessary to put this item in the minutes.	DOH agreed except for the following items. 6-1.1 Both side agreed that JST will answer to DOH after further study in Japan. 6-1.2 JST agreed.	Results are mentioned in the following. 6-1.1 JST proposed 18 months for construction works, including traffic control, based on technical analysis in Japan. 6-1.2 This item was deleted at this time. 6-1.3 This item was deleted at this time.	-	-

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SUMMARY OF DISCUSSION & AGREEMENT (8/11)

[August 16th 2012 ~ August 28th 2012]

DOH : Department of Highways
JST : JICA Study Team

No.	Date	Discussion with Bureau / Division of	Subjects	Contents of Discussion	Agreements	Final Detailed Design	Organization / Position	Signature
6	August 28 th	Mr. Nuttasak Ariyapark <i>Civil Engineer, Bureau of International Highways Cooperation</i> [JICA] Mr. Kunihiko Yamauchi (Team Leader) <i>Deputy Director General for Planning and Coordination, Global Environment Department</i> Mr. Hideaki Matsumoto (Project Coordinator) <i>Deputy Director of Disaster Management Division1, Water Resources and Disaster Management Group, Global Environmental Department</i> [JICA STUDY TEAM] Mr. Takahiro Mishina (Chief Engineer) Mr. Minoru Miura (Road Planner)	6-2. Tender Documents	<p>6-1.4 Minute (Item 7-2)</p> <p>7-2 Consolidation Settlement The Team explained and DOH agreed that Consultant and the Contractor shall not be liable for any result related consolidation settlement during and after the construction.</p> <p>DOH pointed out that it is not necessary to put this item in the minutes. In terms of consolidation settlement, the allowable settlement should be indicated in specification and tender documents.</p> <p>6-2.1 Form of Contract, Article7. Client's Responsibilities</p> <p>7.1 4) To provide electric power, 7.1 5) To provide the telephone lines to the main terminal board, 7.1 6) To provide city water to the main terminal point at the project site.</p> <p>DOH pointed out that this item meant DOH has a responsibility for all preparation for construction. DOH will assist in the contractor's preparation. This item shall be put in specification and tender documents.</p> <p>6-2.2 a) Form of Contract, Article9. Inspection and Delivery</p> <p>9.1 Upon Completion of the Work for each interim payment, the Contractor shall request an inspection by the Consultant</p> <p>b) Form of Contract, Article11. Performance Security</p> <p>11.1 The Contractor shall provide a performance security issued by a Japanese financial institution, which secures the proper execution of all the Contractor's obligations during the period from the date of issue of certificate of completion of the Work of this Contract. The Consultant shall have the custody of the performance security.</p>	<p>6-1.4 JST agreed. Result of analysis based on additional boring investigation shall be put in the final report.</p> <p>6-2.1 JST agreed.</p> <p>6-2.2 Position of consultant and DOH shall be made clear in tender documents.</p>	<p>6-1.4 This item was modified after the meeting. The specification will be revised.</p> <p>6-2.1 The sentence are basically in conformity with E/N as well as G/A, and so are not deleted.</p> <p>6-2.2 The definitions are clearly mentioned in the Consulting Service Agreement. The Agreement, Article 1 "Definition"</p> <p>"The Client" means Department of Highways, Ministry of Transport, the Kingdom of Thailand. The Client shall include any person or persons authorized by the Client.</p>	-	-

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SUMMARY OF DISCUSSION & AGREEMENT (9/11)

[August 16th 2012 ~ August 28th 2012]

DOH : Department of Highways
JST : JICA Study Team

No.	Date	Discussion with Bureau / Division of	Subjects	Contents of Discussion	Agreements	Final Detailed Design	Organization / Position	Signature
6	August 28 th			<p>c) Conditions of Contract, Item 7</p> <p>7. Construction Program and Schedule The Contractor shall submit a detailed construction program for the approval of the Consultant, within thirty (30) days after the date of signing the Contract, in such form and detail as the Consultant shall reasonably prescribe, for the execution of the Work, inclusive of detailed schedule on cost estimate of his own.</p> <p>If at any time it should appear to the Consultant that the actual progress of the Work does not conform to the program to which approval has been given, the Contractor shall produce, at the request of the Consultant, a revised program showing the modification to such program necessary to ensure completion of the Work within Time for Completion.</p> <p>d) Conditions of Contract, Item 11</p> <p>11. Consultant (1) The Consultant shall act on behalf of the Client as specified below. When any different provision is made, the Client shall notify the Contractor in writing thereof.</p> <ul style="list-style-type: none"> a. Check and approve the construction program and schedule and other related Documents submitted by the Contractor; b. Check and approve shop drawings, samples, catalogues, etc. prepared and/or submitted by the Contractor; c. Give instructions and attend to the execution of the Work in general; d. Approve construction materials and working method and attend to tests; e. Inspect the progress of the Work and make inspection of the Work in conformity with the Contract Documents, and attend at the acceptance of the Work; f. Technically check applications for interim payments submitted by the Contractor as to their compliance with the actual work done; and g. Technically check applications for extension of Time for Completion, if any required. 		<p>"The Consultant" means CTI Engineering International Co., Ltd., which shall provide professional services for assistance of tendering and supervision of the establishment of the Project. The Consultant shall include any person or persons authorized by the Consultant.</p>		

SUMMARY OF DISCUSSION & AGREEMENT (10/11)

[August 16th 2012 ~ August 28th 2012]

DOH : Department of Highways
JST : JICA Study Team

No.	Date	Discussion with Bureau / Division of	Subjects	Contents of Discussion	Agreements	Final Detailed Design	Organization / Position	Signature
6	August 28 th			<p>(2) The Consultant shall respond to requests made by the Contractor as for negotiation, instruction, inspection, checking, attendance, opinion, or approval, without unreasonable delay.</p> <p>(3) All communications of technical nature in respect of the Work between the two parties, the Client and the Contractor, shall be made through the Consultant.</p> <p>(4) The Consultant shall inform the Contractor the name of his representative in writing, after the approval of the Client.</p> <p>(5) When the Consultant appoints his assistants for the inspection and attendance, the Consultant shall inform the Contractor the names of such assistants in writing.</p> <p>(6) The instruction or approval given by the Consultant to the Contractor shall be effective when it is in writing. However, any approval given to the Contractor as above does not relieve the Contractor from any of his responsibilities under the Contract.</p> <p>DOH pointed out that position of consultant and DOH is not clearly defined.</p>	<p>6-2.3 Both side agreed that JST will answer to DOH after studying.</p>	<p>6-2.3 The period of the defect warranty is one year, determined in Japan Grant Aid Program.</p>		
				<p>6-2.3 Form of Contract, Item 10. Warranty against Defects</p> <p>10.1 The Contractor shall warrant the Work to be executed in accordance with the Contract Documents for a period of one (1) year from the date of issue of the certificate of completion of the work.</p> <p>DOH requested that the liability for defect warranty of contractor is set for two years as same to Thailand.</p>	<p>6-2.4 Both side agreed that JST will answer to DOH after studying.</p>	<p>6-2.4 The defect warranty is not included in the performance security based on the JICA Rule.</p>		
				<p>6-2.4 Form of Contract, Article 11. Performance Security</p> <p>11.1 The Contractor shall provide a performance security issued by a Japanese financial institution, which secures the proper execution of all the Contractor's obligations during the period from the date of signing of this Contract to the date of the issue of certificate of completion of the Work of this Contract. The Consultant shall have the custody of the performance security.</p> <p>DOH requested that the liability for defect warranty also should be included in performance security.</p>				

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SUMMARY OF DISCUSSION & AGREEMENT (11/11)

【August 16th 2012 ~ August 28th 2012】

DOH : Department of Highways
JST : JICA Study Team

No.	Date	Discussion with Bureau / Division of	Subjects	Contents of Discussion	Agreements	Final Detailed Design	Organization / Position	Signature
6	August 28 th		6-3: Others	6-3.1 Request for consideration Mr. Chayatham Director of International Highways Cooperation requested to consider the following topics, <ul style="list-style-type: none"> To minimize traffic jam at the toll gate in the construction To secure the 15m length opening at 500m interval for emergency situation. 	6-3.1 JST will answer after further study in Japan.	6-3.1 The Consultant will assist in minimizing the traffic jam at the toll gate in the construction with cooperation from DOH. Additionally, the 15m length opening at 500m interval for emergency situation, is planned to be placed along the diversion route in the construction.	-	-
				6-3.2 Request for consideration Mr. Chayatham Director General of DOH requested to share with JST the information on a process, procedure and schedule of the project.	6-3.2 JST agreed and will share it.	6-3.2 Process, procedure, and schedule of the project will be shared.	-	-

Notes:
This Document is defined as a portion of the Minutes of Meetings on the Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road in the Kingdom of Thailand, which the Japan International Cooperation Agency (JICA) and the Department of Highways have agreed to concluded on August 29, 2012.

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APPENDIX 2

Implementation Schedule The Rehabilitation Project for the Outer Bangkok Ring Road



- Remarks
- In Japan
 - In Thailand
- ① Agreement with Consultant
 - ② Verification of Agreement
 - ③ Meeting for Project Implementation
 - ④ Detailed Design
 - ⑤ Approval of Tender Document
 - ⑥ Notice for Invitation of Pre-qualifier
 - ⑦ Distribution of Tender Document
- ⑧ Tendering
 - ⑨ Signing of the Contract
 - ⑩ Verification of Contract
 - ⑪ Site Supervision
 - ⑫ Implementation Works
 - ⑬ Final Inspection and Hand Over

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APPENDIX 2

Implementation Schedule The Rehabilitation Project for the Outer Bangkok Ring Road

		2012												2013												2014											
		FY 2012				FY 2013				FY 2014				FY 2013				FY 2014				FY 2014															
		6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12					
Contract	ITEM	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12					
	Exchange of Notes, Grant Agreement			▼																																	
Bidding Activity	Consultant Contract				■																																
	Preparation of Bidding Document				■																																
	Bidding Document Approval				■																																
	Bid Announcement and Pre-qualification of Bidders				■																																
	Bidding, Evaluation of Bid Documents				■																																
Construction Schedule	Contract Agreement								■																												
	Preparation								■																												
	Temporary Work (Traffic Control)								■																												
	Pavement Work (Raising Road Elevation)								■																												
	Toll Gate Work								■																												
	Demobilization																																				

REGEND
 E/N : Exchange of Notes
 G/A : Grant Agreement

Traffic Open

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The Rehabilitation Project of the Outer Bangkok Ring Road in Thailand

Consolidation Settlement

A basic policy, analysis result, and countermeasures toward the anticipated consolidation settlement are as mentioned in the following:

1. The Current Condition of the Objective Road

An expanding construction of the objective road from 4 lanes to 8 lanes was completed in 2009, and since then the three years has passed by. Additionally, on a basis of the soil investigation and its analysis in the preparatory survey (Examining cement treated base course), it is concluded that pavement structure of the objective road does not possess any defects or clacks. As a result, it is considered that differential settlement does not occur under the condition. However, an explanation of analysis should assume the occurrence of a settlement to the certain degree in the overall objective road. The settlement appears to uniformly occur. Given the situation where the limited information of the settlement measurement after the expanding rehabilitation is obtained, the time schedule and the degree of the settlement could not be clarified.

2. The Basic Policy toward the Consolidation Settlement

Since the Rehabilitation Project of the Outer Bangkok Ring Road is going to be carried out under Japanese Grant Aid and under the condition of the urgent disaster recovery assistance, the countermeasures for the consolidation settlement cannot be adopted in this project as the basic policy, but the anticipated degree of consolidation settlement on the basis of the analysis and the suggestion for the proper maintenance implementation will be clearly indicated in the final report.

3. Summary of Consolidation Settlement Analysis

The preparatory survey implemented by JICA Study Team conducted the boring investigation and the analysis for the consolidation settlement. The summary of analysis is as shown in the following table. The boring investigation was conducted around the shoulder along the objective road due to an effect of the investigation upon traffic flow on the objective road and a safety matter for ordinary vehicles.

Analysis Summary Table

(1) Toll Gate Section

Period	Settlement Degree		Remarks
	Accumulated Settlement Degree	Settlement Degree per year	
1999 ~2013	10.3cm	—	Settlement due to construction of the existing road
2014	16.9cm	6.6cm	The Rehabilitation Project Period
2015	20.0cm	3.1cm	Warranty Period
2023	32.8cm	12.8cm	Performance Period of the Pavement
	計	22.5cm	

(2) Other Section

Period	Settlement Degree		Remarks
	Accumulated Settlement Degree	Settlement Degree per year	
1999 ~2013	16.4cm	—	Settlement due to construction of the existing road
2014	19.2cm	2.8cm	The Rehabilitation Project Period
2015	20.5cm	1.3cm	Warranty Period
2023	26.1cm	5.6cm	Performance Period of the Pavement
	計	9.6cm	

In order to enhance an accuracy of the consolidation settlement analysis, the boring investigation has been being implemented. Its investigation and analysis will be expected to be finalized at end of September, 2012.

4. Allowable Consolidation Settlement

The purpose of the Rehabilitation Project is to secure the function of logistic network even in the time of flood disaster (similar to 2011 flooding), by raising the 4 lanes on the north bound roadway surface of the Outer Bangkok Ring Road.

To achieve this purpose, the road elevation to be raised in the Project was established in the preparatory survey. It is mentioned in the following:

Toll Gate Section: Plus ten (+10) cm from the largest recorded level in 2011 (historical highest flood level)

Reason: Toll gate, especially toll booth where toll fee is collected at hand, should not be affected by flooding. In other word, toll booth should not be inundated.

Other Sections: Minus twenty (-20) cm from the largest recorded level in 2011 (historical highest flood level)

Reason: The traffic flow of “regular vehicle” should be secured, while 20cm inundation occurs. It is considered that the 20cm inundation would basically reduce 60% of the full traffic capacity as well as the design speed on the road.

Although the plan established the aforementioned elevation level of the objective road, which just means design policy for the Project, in terms of “allowable” consolidation settlement, it is considered as justifiable that “the allowable consolidation settlement” should be defined as “the maximum degree of consolidation settlement under which the function of logistic network even in the time of flood disaster is secured. Consequently, the allowable degree of consolidation settlement in the toll gate and other section is following:

Toll Gate Section: Minus twenty seven point five (-27.5) cm from the designed elevation level

Other Section: Minus seven point five (-7.5) cm from the designed elevation level

A mechanism of the allowable degree of consolidation settlement in detail is illustrated in Appendix 1.

5. Result and Countermeasure

(1) Countermeasures for Consolidation Settlement during Construction

As mentioned above, the anticipated degree of the consolidation settlement during the rehabilitation project period is about 7.0 cm in the toll gate section and about 3.0cm in the other section, which means 30% of the anticipated degree of consolidation settlement in the performance period of the pavement. To deal with the settlement degree, the extra fill for settlement is considered as a countermeasure. And then a cost of subbase material as one for the extra fill is included in the cost estimation and the extra fill method for settlement is clearly mentioned in the tender document.

Additionally, it is required as work output control that the construction elevation level of the objective road is consistent with the design elevation level.

Since the scope of the rehabilitation project possesses 15.0km length, the portion of the rehabilitation in the objective road is expected to be completed, and work output control as well as required quality should be confirmed each time when each portion of the rehabilitation is completed. As a result, partial handover in each portion of the rehabilitated road should be considered if necessary.

(2) Warranty Period (One year after completion)

Based on the analysis, the anticipated degree of the consolidation settlement during the warranty period is about 3.1 cm in the toll gate section and about 1.3cm in the other section.

As aforementioned, the analysis illustrates the occurrence of a settlement to the certain degree in the overall objective road. The settlement appears to uniformly occur. Given the condition, the anticipated degree of the consolidation settlement is not considerable enough to seriously affect the pavement structure. However, this analysis result does not guarantee the degree of the consolidation settlement mentioned above, and there is a possibility of the consolidation settlement to a larger extends than assumed. Thus, since the countermeasures for the anticipated consolidation settlement in the detail design is not considered, it is proper that the obligation for the settlement should be exempted in the warranty. Plus, it is answered from the surety and insurance companies that it is hard to warrant the issues related to the consolidation settlement. Therefore, it is justifiable that the warranty should just cover the any structural and dysfunctional defects caused by the Work to be executed in accordance with the Contract, except for the defects related to the consolidation settlement.

To justify the cause of the defects, it is necessary to request that DOH conduct the periodical measurement for the degree of the settlement after the construction completion, keep watch and measurement for any defects related to the settlement if discovered. Also, in order for two sides to agree with the warranty against defects, the nature, the necessary information and extent of the defects, which clearly indicates the relation of the work with the defects, should be collected and shared between two sides. After the warranty period, the Client, the Contractor and the Consultant should have discussion on it, based on the collected data, and decide the repair point.

The allowable degree of the dysfunctional defects such as Rutting should be discussed and agreed upon before the completion of the construction.

(3) Performance Period of the Pavement (After Warranty Period)

It is requested that after warranty period, the implementing organization, DOH, carries out the periodic inspection for the consolidation settlement and properly maintains the objective road. When the aforementioned degree of the consolidation settlement occurs, for example, it should be of a necessity to raise elevation level of the objective road, conducting the overlay method in order to keep functionalizing the objective road.

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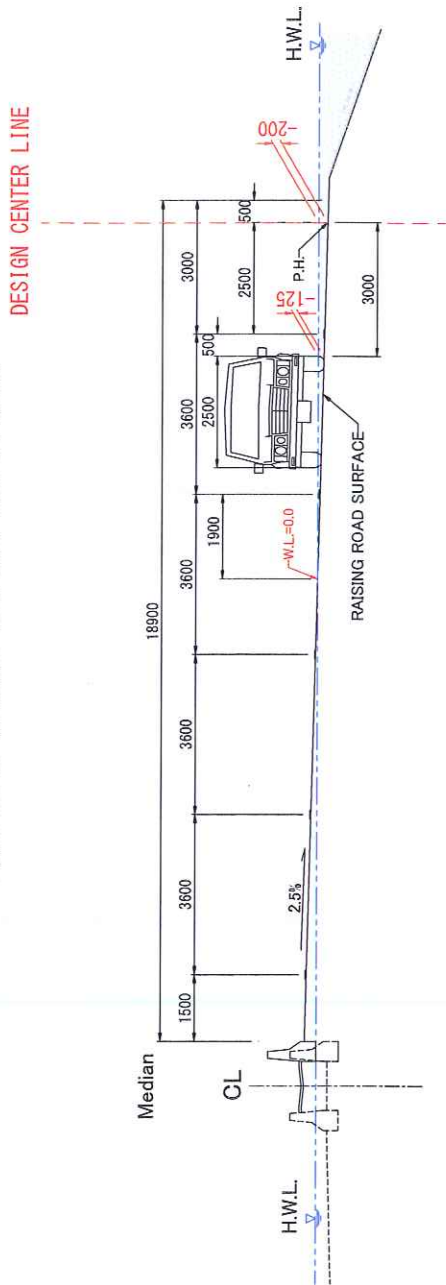
Appendix 1-1: Allowable Consolidation Settlement in Toll Section



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Appendix 1-2: Allowable Consolidation Settlement in Other Section

PROPOSED HEIGHT BEFORE SETTLEMENT



ALLOWABLE CONSOLIDATION SETTLEMENT (-0.075m)

