

## Chapter 3 Project Evaluation and Recommendations

### 3.1 Project Effect

The aim of the Project is to improve the damages and deteriorated pavement observed all through the road, by implementing the road improvement of about 54 km in between Phnom Penh and Neak Loueng, to restore the function and capacity of the Trunk National Road, by widening the road and replacing temporary bridges which are the bottleneck at present, and smoothen the flow of goods and peoples.

The direct beneficial are the residents of Phnom Penh in which the Project located and of Kandal Province, and the indirect beneficial are all the population of 2.65 million (estimated population in 2006) in Cambodia.

The direct and indirect positive effects under the Project implementation are described on Table 3.1-1, and Table 3.1-2 as below, the negative effects are on the table 3.1-3 and Table 3.1-4.

Table 3.1-1 Direct Positive Effects by the Implementation of the Project

Present Conditions and Issues	Counter Measure under the Project	Effect and its Degree of the Project Improvement
<p><b>1. Function as Arterial National Road</b></p> <ul style="list-style-type: none"> <li>- Road is narrow;</li> <li>- Congested with vehicles and motorcycles being mixed; and</li> <li>- Bridges with one lane</li> </ul> <p>The above is causing lower efficiency of traffic flow, and congestion, that is, significantly disturbing the function of as a trunk road.</p>	<p>To widen the road width by separating 4-wheel lane and motorbike lane, and replace or newly construct the bridges.</p> <ul style="list-style-type: none"> <li>- 4-wheel lane section: 1.8 km (Beginning - Sta. 1+800)</li> <li>- Motorbike lane section: 54.18 km (Sta. 1+800 - Ending)</li> <li>- Bridge replacement/construction: 3 nos.</li> </ul>	<ul style="list-style-type: none"> <li>- To expect the improvement of traffic capacity, reduction of travel time, upgrading of traffic ability and traffic safety.</li> <li>- To upgrade the function of the National Road</li> </ul>
<p><b>2. Function as Lifeline</b></p> <p>Regarding the market area, bus stop/emergency evacuation space, and schools/hospitals, inconvenience caused by the issues below.</p> <ul style="list-style-type: none"> <li>- There are no roadside service facilities; and</li> <li>- Restricted or without parking space and sidewalk</li> </ul>	<p>To install the roadside service facilities as below along the connecting roads from the rural community or village center.</p> <ul style="list-style-type: none"> <li>- Small-scale market area: 3 nos.</li> <li>- Bus stop: 20 nos.</li> <li>- School/hospital area: 40 nos.</li> </ul>	<p>Marketing activities become active and evacuation space for the livestock can be ensured at the time of flood with securing the smooth traffic flow through the solution on the traffic congestion around the market area, bus stop/emergency evacuation space.</p>
<p><b>3. Travel Time</b></p> <ul style="list-style-type: none"> <li>- Average speed is 30 kph now from Phnom Penh to Neak Loueng about 55.98 km long</li> <li>- Travel time is 1 hour and 50 minutes</li> </ul>	<ul style="list-style-type: none"> <li>- To construct the economic and durable road structure and pavement with high traffic ability.</li> </ul>	<ul style="list-style-type: none"> <li>- Vehicle travel speed becomes 80kph.</li> <li>- Travel time can be shortened as 45 - 50 minutes.</li> </ul>

Present Conditions and Issues	Counter Measure under the Project	Effect and its Degree of the Project Improvement
<p><b>4. Heavy Cargo Traffic</b></p> <p>Two bridges to be replaced are temporary Bailey bridges with one lane only, and limited to the vehicle loads of 15 tons.</p>	<ul style="list-style-type: none"> <li>- To replace as the bridges with design active loads by HS20-44.</li> </ul>	<ul style="list-style-type: none"> <li>- To enable heavy cargoes to pass through; and</li> <li>- To promote the efficiency of cargo service.</li> </ul>
<p><b>5. Flood Countermeasures</b></p> <p>(1) Stage of the Mekong river</p> <ul style="list-style-type: none"> <li>- There exist two (2) pipe culverts and two (2) box culverts in the opening before 2000 flood. However, each one culvert among these four culverts cannot respectively work.</li> <li>- Two (2) openings were excavated because Phnom Penh municipality was on the edge of submerge riskiness due to the stage of the Mekong River was going up to 10.16 m. Two Bailey bridge were built on both places.</li> <li>- Flood countermeasures are still no sufficient due to the poor conveyance, even four (4) box culverts were newly installed.</li> </ul> <p>(2) Road Elevation</p> <p>The difference between the present road surface elevation and flood level in 2000 is only 30 cm on average. Consequently, overflow occurred on three (3) places (total length: 1.1 km) in 2000 flood.</p> <p>(3) Slope Damages</p> <p>At the time of flood, damages on bank slopes occurred frequently by the flow especially around the road curves, bridge peripheral parts and water colliding fronts.</p> <p>(4) Refuge Space</p> <p>No refuge space is provided, at the time of flood residents retire to road space and cause at the malfunction of the road.</p>	<p>Place the additional openings:</p> <ul style="list-style-type: none"> <li>- Newly construction of one bridge;</li> <li>- Replacement of two (2) bridges;</li> <li>- Newly installation of seven (7) box culverts; and</li> <li>- Newly installation of two (2) pipe culverts.</li> </ul> <ul style="list-style-type: none"> <li>- To raise the road surface elevation by 70 cm on average</li> <li>- Revetment works will be done for the bank slopes where are easily destroyed so as to mitigate the flow attack; and</li> <li>- To install greenbelt around the said three bridges.</li> <li>- Shoulder is widened as bus stop / refuge space at the twenty (20) intersections at connection road.</li> </ul>	<ul style="list-style-type: none"> <li>- To reduce the flood riskiness by lowering the water level of about 11 cm in the Mekong river near the Phnom Penh Municipality.</li> <li>- No more overflow occurs at the time of flood;</li> <li>- To enhance the travel safety; and</li> <li>- To improve the durability of road structures.</li> <li>- To sustain the stable embankment with the slope protection of road embankment by installing greenbelt; and</li> <li>- To expect the additional affects as environmental protection.</li> <li>- At the time of flood, 3,000 residents are available to retire at its maximum.</li> </ul>
<p><b>6. Drainage Facilities</b></p> <ul style="list-style-type: none"> <li>- No rainwater drainage facilities within the urbanization areas such as Chbar Ampov, Kokir Market, and Neal Loueng.</li> <li>- To cause the degradation of traffic function and limiting of traffic safety because the rainwater is discharged into the roads during raining.</li> </ul>	<p>Installation of road drainage facilities as below:</p> <ul style="list-style-type: none"> <li>- U-shaped side ditch: L=2,230m (both sides)</li> <li>- Drainage channel: L=5,045m</li> </ul>	<ul style="list-style-type: none"> <li>- To secure the smooth traffic flow and improve the traffic safety by installing the road drainage facilities.</li> </ul>

Present Conditions and Issues	Counter Measure under the Project	Effect and its Degree of the Project Improvement
<p><b>7. Traffic Safety</b></p> <ul style="list-style-type: none"> <li>- Road width is almost 6.5m on an average;</li> <li>- High riskiness of traffic accident occurrence due to the traffic is mixed with 4-wheel vehicles and motorbikes without separation.</li> </ul>	<p>To improve traffic safety by separating the traffic between vehicle and motorbikes.</p> <p>The following traffic safety facilities were installed.</p> <ul style="list-style-type: none"> <li>- road marking: centerline, lane, sidetrack, pedestrian crossing</li> <li>- traffic sign: regulatory signs (speed limit), warning signs (sharp turn, school), guide signs</li> <li>- guardrails/guideposts: bridge's or culvert's circumference, fill with height more than 5 m.</li> </ul>	<ul style="list-style-type: none"> <li>- To expect the reduction of traffic accidents by traffic facilitation based on the separation between 4-wheel vehicles and motorbikes</li> <li>- To install the various traffic safety facilities to assure the safety of increasing and speeding-up passing vehicles.</li> </ul>

Table 3.1-2 Indirect Positive Effects by the Implementation of the Project

Present conditions and Issues	Counter Measure under the Project	Effect and its Degree of the Project Improvement
<p><b>1. Smooth Flow of Goods and Peoples</b></p> <p>Present narrow road width and the structure that is easily damaged by flood, lower the function of national trunk road and limit the smooth flow of goods and peoples.</p>	<p>To upgrade the road structures and improve the function of the national roads.</p>	<p>Improvement of national trunk road function by reducing the transport time and costs will encourage the flow of goods and peoples.</p>
<p><b>2. Socio-Economic Activities</b></p> <p>Socio-Economic activities are not activated enough due to inadequate distribution of goods and association of peoples.</p>	<p>To improve the function of national trunk road and upgrade the lifeline function.</p>	<p>To promote socio-economic activities due to the increment of exchange of goods and peoples.</p>
<p><b>3. Upgrade of Residents' Living Standards along the Road</b></p> <p>Transport cost is high due to the long transport time of agricultural goods, and poor access to the schools/hospitals and urban facilities.</p>	<p>To improve the traffic ability by larger traffic capacity, and install roadside service facilities</p>	<p>To transport easily agricultural goods, and improve the access to schools/hospitals and urban facilities.</p>

Table 3.1-3 Direct Negative Effects by the Implementation of the Project

Issues	Counter Measures (Counter Measures under/over and above the Project)
<p><b>1. Increase of Traffic Accident</b> NRI is functioning as a life road for the residents those stay along the road. There is a possibility of increasing the traffic accident due to the high speed driving after the improvement.</p>	<p>To enlighten all road users' traffic safety consciousness/knowledge, by holding a traffic safety education to the pupil/students and residents, and promote the driving moral through the traffic safety campaign/maintain control of driving speed.</p>
<p><b>2. Effect by New Opening</b> Water flows into Colmatage through the new openings and erode the agricultural land or residential area. Moreover, there is a possibility to affect fauna and flora.</p>	<p>I.R.C would compensate for the damage when it is confirmed by PAP and MoRAM. It is very difficult to forecast the effect to ecosystem, therefore the Environmental Baseline Survey was conducted in March 2005, and follow up Survey will be conducted to confirm the presence or magnitude of effect.</p>
<p><b>3. Overloaded Vehicle</b> When the function as arterial road is improved number of car will increase and at the same time illegal overloaded vehicles increase. There is a possibility that overloaded vehicle will damage the pavement and cause the traffic accident.</p>	<p>The truck scales are planned and shall provided through the Project. Cambodian side shall maintain the control of overloaded vehicle by utilizing the provided facility to prevent the road damage or traffic accident due to the overloaded vehicle.</p>

Table 3.1-4 Indirect Negative Effects by the Implementation of the Project

Issues	Counter Measures (Counter Measures under/over and above the Project)
<p><b>1. Increase of HIV/AIDS</b> Road improvement will activate the human interchange and spread HIV/AIDS.</p>	<p>To enlight all Project employees the fundamental knowledge and prevention means though the safety meeting opportunity during the construction stage.</p>

### 3.2 Recommendations

The Government of Cambodia is expected to fulfill the following items, issues and recommendations, in order to execute the project satisfactory and maintain the sustainability of the effect of the Project:

#### (1) Issues

- As for the agreement related to the in voluntary resettlement, Cambodian side should proceed reasonable schedule subject to the appropriate milestone which was agreed with Japanese side and carry out a necessary report to Japanese side.
- To keep good maintenance. It is important, especially to maintain the road pavement and opening structures such as bridges and culverts for the road maintenance. Road maintenance is not only for comfortable driving, but also for prolonging the durability (periods until the maintenance required). To secure adequate budget to have good road maintenance, which is inevitable. It is also important to keep drainage structures and bearings clean, to repair the revetment and riverbed protection, and to maintain the slope vegetation and thus to prolong working life.
- With regard to the Colmatage side, of which influence might come up in the form of water intake into the area, as a result of additional new openings, the attention should be paid to the impact to the social and natural conditions. Especially, within the parts without waterway on the Colmatage side, careful observation should be done to prevent the reverse impact to the existing farmlands and inhabited area from scouring. Therefore, establishment of countermeasure system is required by establishing the information system from the residents to grasp the flooding and disaster etc. information as soon as possible together with the thorough monitoring during the rainy season.
- As a result of road improvement, it is predictable that the traffic speed will be increased. Therefore, it is important to maintain traffic safety by the implementation of traffic safety education, improvement of traffic manner and observance of traffic regulations etc.
- It is indispensable to check whether the resettlement especially those livelihoods of the socially weak are already reintegrated or not. In addition, it is recommended that adoption of those affected inhabitants shall be employed as workers during construction stage, and for the maintenance jobs such as clearing and the crossing guard/guides within the areas of markets/schools/hospitals, to assist the reintegration of livelihood of the said peoples.
- It is recommended that Cambodian side shall utilize the results of Environmental Baseline Survey conducted March 2005, and proceed the monitoring after completion of the Project appropriately.
- To increase the traffic capacity by the improvement of the Monivong Bridge. Moreover, the

maintenance of those roads connect with National Road No.1 as much as possible is desirable. Therefore, the expanding effects by the Project can be expected.

(2) Recommendation

Technical assistance on the maintenance and traffic safety measures to be implemented is recommended to ensure the maintenance and traffic safety, and secure manifestation/sustainment of the Project effects. Specifically, system formulation and establishment of guidelines are indispensable.

### 3.3 Project Adequacy

It is reasonable to judge, upon the reason mentioned below, that the project is adequate to implement under the grant aid program of the Government of Japan:

- ① It contributes to the improvement of living standard of residents by improving as a life road, reduction of traffic accidents, provision of countermeasure against flood, activation of social and economic activities, as an effects of the project implementation.
- ② Domestic funds and man-power and technology would be suit for the administration and maintenance, since it doesn't require highly sophisticated technology.
- ③ The Government of Cambodia has targeted in "the Second 5 years Socio-Economic Development Plan (2001~2005)", to improve trunk roads as an aim of road improvement, in this connection, the present project is worthy to attain the goal of the plan, and in addition, the present project is incorporated in the course of "Asian Highway".
- ④ Apart from the involuntary resettlement, in terms of negative impacts of the project in aspect of environment social considerations, it is very possible to overcome significantly the impacts, by studying the contents of the present report and reflect the result of it on the design. After completion of the Project, to carry out monitoring is recommended considering the results of Environmental Baseline Survey.

For the involuntary resettlement, careful consideration is due to affected residents, to have approval and concurrence from them., so that based upon the suggestion of the "JICA Advisory Council of Environmental and Social Consideration Reviews", the Basic Study has been carried out from in January to March, 2005, and others, such as Supplemental Study, Baseline Study and Preliminary Study II (Second Environmental Social Consideration Supporting Study) have been taken place, for the study of adequacy of the resettlement, of which needs occurred in the Phase-1 portion, to be established under the responsibility of the Government of Cambodia. The result of it has been presented as a suggestion in this detailed design stage, to minimize the negative impacts to PAPs.

### **3.4 Conclusion**

The Implementation of the project is expected to have enormous positive effects, as mentioned above, on condition that the Royal Government of Cambodia shall take an appropriate countermeasures against involuntary resettlement, and contributes to the residents in improving their living standards, it is, therefore, quite adequate to execute the project under the grant aid program of the Government of Japan. Further, in terms of the administration and maintenance after the completion of the project, it is very much likely that the Government of the Cambodia has no problem in arranging the funds and manpower. However, its is noted that the design and estimation for the section from Sta.0+000 to Sta.1+900 has been excluded from the scope of Stage-3, due to un-accomplishment of reaching agreement on the Project.



## Appendix 1 Member List of the Study Team

No.	Name	Job Title	Occupation
1	Dr. INABA Makoto	Leader	Deputy Director General Grant Aid Management Department, JICA
2	Mr. IMAI Ken	Project Coordinator	Senior Project Administration Officer, Transportation and Electric Power Team, Project Management Group I, Grant Aid Management Department, JICA
3	Mr. HIRAOKA Kazuyuki	Chief Consultant / Socl.&Env.Specialist /Road Planner	Katahira & Engineers International
4	Mr. FUKUMA Takao	Road Designer/ Natural Condition Survey Engineer	- ditto-
5	Mr. Shrestah Robinson	Road Designer	- ditto-

## Appendix 2 Study Schedule

No. of Day	Date	Official	Consultants	
		Dr. INABA, Mr. IMAI	Mr. HIRAOKA, Mr. S. Robinson	Mr. FUKUMA
1	28-Aug-07 Tue.		NRT(10:30)→BKK(15:05)JL717 BKK(18:10)→PNP(19:25)TG698	
2	29-Aug-07 Wed	NRT(11:30)→BKK(15:30)TG641 BKK(18:10)→PNP(19:25)TG698	Explanation on Inception Report to MPWT	
3	30-Aug-07 Thu	Meeting at JICA Office Site visit (Phnom Penh – Neak Loueng Section)		
4	31-Aug-07 Fri	Courtesy Call and meeting with IRC (MPP is involved in the meeting) Courtesy Call and meeting with MPWT (MPP is involved in the meeting)		
5	01-Sep-07 Sat	Site visit (National Road No.1)		
6	02-Sep-07 Sun	Meeting and discussion on the finalization of M/D with MPWT		
7	03-Sep-07 Mon	Sign on M/D		
8	04-Sep-07 Tue	Report to Embassy of Japan and JICA Cambodia Office		
9	05-Sep-07 Wed	Meeting in JICA Cambodia Office		
		PNP(20:25)→BKK(21:30)TG699 BKK(23:10)→	Field Survey	
10	06-Sep-07 Thu	→NRT(07:30)TG642	Field Survey	
11	07-Sep-07 Fri		Report to JICA Cambodia Office PNP(20:25)→BKK(21:30)TG699 BKK(23:25)→	Field Survey
12	08-Sep-07 Sat		→NRT (07:30) JL704	Field Survey
13	08-Sep-07 Sat			PNP(20:25)→BKK(21:30)TG699 BKK (23:25)→
14	08-Sep-07 Sat			→NRT (07:30) JL704

### **Appendix 3 List of Parties Concerned in Cambodia**

#### MPWT (Ministry of Public Works and Transport)

Mr. Sun Chanthol.	Minister
Mr. Tauch Chankosal.	Under Secretary of State
Mr. Vong Piseth	Deputy General Director of General Directorate of Public Works
Mr. Slot Sambo	General Director of Administrative Service
Dr. Yit Bunna.	Director Public Work Research Center
Mr. Chhim Phalla.	PIU NR1

#### IRC (Inter-Ministerial Resettlement Committee)

Mr. Nhean Leng	Chairman, MEF
Dr. Chhorn Sopheap	Chief of Resettlement Unit, MEF
Mr. Sim Samnahg	Deputy Chief of Resettlement Unit, MEF
Mr. Ben Daramony	Chief of Division for Bilateral and Government Project, MEF
Mr. Hiv Panhavuth	Chief of Administration and Finance Resettlement Unit, MEF
Mr. Pal Chhan	Deputy Chief of Division for Bilateral and Government Project, MEF
Mr. Im Sethyra	Deputy Chief of Resettlement Unit, MEF
Mr. Kong Sophal	Working Group, NR1, MPWT

#### MPP (Municipality of Phnom Penh)

Mr. Chreang Sophan	Vice Governor, MPP
Mr. Kouch Chamreun	Governor of Meanchey District, MPP
Mr. Dy Sanith	Deputy of Land Management, Urbanization, Construction Department, MPP
Mr. Ney Sona	Vice Director of Public Works and Transport, MPP
Mr. Sam Piseth	Cabinet Office, MPP
Mr. Bun Dosa	Cabinet Office, MPP

## Appendix 4 Minutes of Discussions

**Minutes of Discussions  
on the Implementation Review Study  
on the Project for the Improvement of National Road No. 1  
(Phnom Penh – Neak Loeung Section)  
in the Kingdom of Cambodia**

In response to the request from the Royal Government of Cambodia, the Government of Japan decided to conduct an Implementation Review Study on the Project for the Improvement of National Road No. 1 (Phnom Penh - Neak Loeung Section) (hereinafter referred to as "the Project") and entrusted the study to Japan International Cooperation Agency (hereinafter referred to as "JICA").

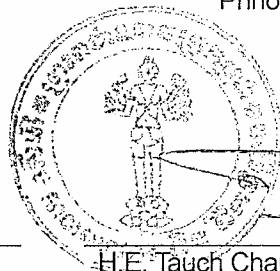
JICA sent to Cambodia the Implementation Review Study Team (hereinafter referred to as "the Team"), headed by Dr. Makoto Inaba, Deputy Director General, Grant Aid Management Department, JICA, which is scheduled to stay in Cambodia from August 28 to September 7, 2007.

The Team held discussions with the concerned officials of the Royal Government of Cambodia. In the course of the discussions, both sides have confirmed the main items described in the attached sheets.

Phnom Penh, September 3, 2007



Dr. Makoto Inaba  
Leader  
Implementation Review Study Team  
JICA



H.E. Tauch Chankosal  
Under Secretary of State  
Ministry of Public Works and Transport (MPWT)  
Kingdom of Cambodia

A handwritten signature in black ink, appearing to read "Nhean Leng".

H.E. Nhean Leng  
Chairman of the Inter-Ministerial Resettlement  
Committee (IRC)  
Kingdom of Cambodia

## ATTACHMENT

### 1. Environmental and Social Considerations for Stage-3 of the Project

(1) The Cambodian side explained on the progress of the consensus reaching of Project Affected Persons (PAPs) in Stage-3 as follows:

- The negotiation in the section from St.1+900 to St.13+100 was finished as shown in Annex-1.
- As for the section from Starting point to St.1+900, the negotiation works will be started after determination of the Provisional Road Width (PRW), which has been under discussion.

(2) The Cambodian side explained that all PAPs understood and supported the Project, however, the negotiation with 8 households of the section from St.1+900 to St.13+100 have not yet agreed with the conditions for the resettlement.

(3) As for the seven of unknown owners' properties, the Cambodian side would make public announcement in each district and/or commune and identify the owners.

(4) The Cambodian side explained that two more resettlement sites would be prepared newly for the PAPs as follows:

- One would be in the Kandal Province, and the progress of the selection work is now in the final stage.
- The other would be in Municipality of Phnom Penh (MPP), and MPP has selected the site.

(5) The Team explained the conditions of the change of Retaining wall to Slope at Road Shoulder End, on which the Japanese side agrees, as follows:

- The Cambodian side should hold the public hearing and consultation on the above-mentioned change in an appropriate manner and basically obtain agreements from all of PAPs on the conditions and contents of resettlement and/or setback. The agreement between IRC and PAPs should contain at least a) items of compensation, b) estimated amount (or unit price and quantities) of compensation, c) commitment to provide replacement land for those who are landless, and d) other measures necessary for maintaining present livelihood of PAPs for a certain period after resettlement and/or setback.

The Cambodian side agreed the aforesaid conditions presented by the Team.

(6) Both sides confirmed that the consensus reaching between the Cambodian authority and the PAPs in the area of Stage-3 should be completed by the end of December 2007, and that the Cambodian side should submit the final report on the result of that consensus reaching to the Japanese side through JICA Cambodia Office by the above-mentioned date.

### 2. Construction of Second Monivong Bridge

(1) The Cambodian side explained that the detailed design of Second Monivong Bridge would be completed before 7 September 2007, and that the construction works is scheduled to be

completed by December 2008.

- (2) The Team expressed that the design and the schedule of the construction of Second Monivong Bridge might affect that of the Project, and thus requested to submit the drawings and the construction schedule without delay in order to clarify the construction area between the Project and the construction work of Second Monivong Bridge implemented by MPP. The Cambodian side agreed on the request made by the Team.
- (3) The Team requested that the policy for the Environmental and Social Considerations issues on the Second Monivong Bridge construction project by MPP should be same to that of the Project because Second Monivong Bridge directly connects to National Road No.1.
- (4) The Cambodian side understood the contents requested by the Team and mentioned that the negotiation of the resettlement was completed in December 2006, so the request made by the Team shall be considered on the change of the design in the future.

### 3. Relocation of Public Utilities

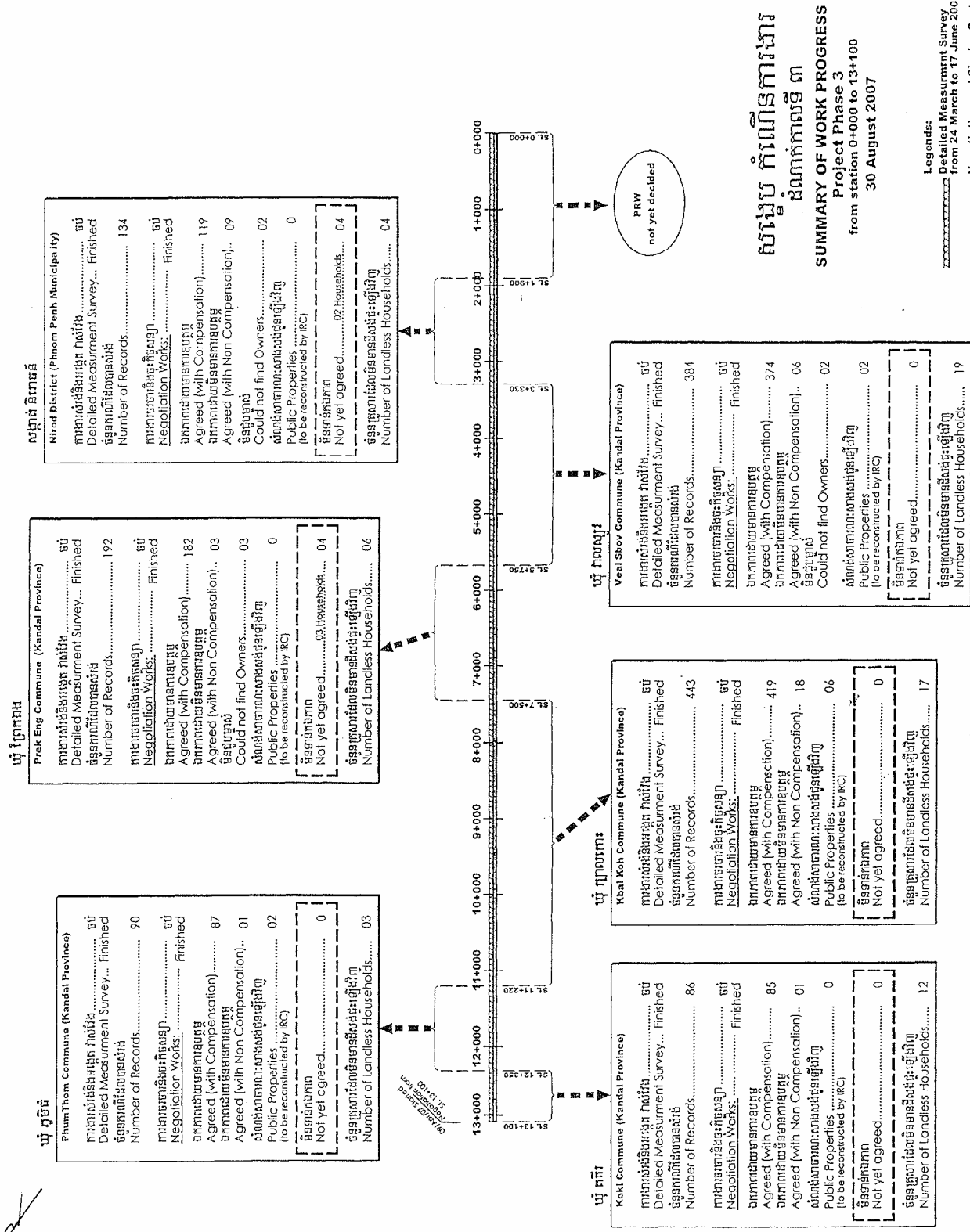
- (1) The Cambodian side agreed the implementation procedure for the relocation of public utilities as shown in Annex 2.
- (2) Both sides confirmed that the Team would submit the documents related to the relocation of public utilities including drawings and tentative schedule of the Project to the Cambodian side by the end of October 2007, in order that the Cambodian side makes smooth coordination and necessary arrangements among the concerned parties in Cambodia.

### 4. Schedule of the study

- (1) The Team will proceed to further studies in Cambodia by September 7, 2007.
- (2) JICA will prepare the report in English and send it to the Royal Government of Cambodia around the end of November 2007.

### 5. Other Issues

- (1) The Cambodian side shall identify and provide all necessary information on the soil borrow pits necessary for the filling works of Stage-3.
- (2) The Cambodian side expressed that the result of the market price survey conducted by the Cambodian side would not be made public in order to avoid any confusions among PAPs.



Flow Chart of Public Utilities Relocation

Duration	Activities	Leading Organization
2.0 Months	Confirmation of Utilities to be relocated	The Consultant
1.0 Month	Inform to MPWT	The Consultant
	Arrange the Meeting	MPWT
1.0 Month	MPWT call Meeting with involved organization in relocation (method, time, estimation etc.)	MPTW <ul style="list-style-type: none"> <li>• IRC (Resettlement)</li> <li>• T.C (Optical Fiber Cable)</li> <li>• E.D.C (Power Cable &amp; Posts)</li> <li>• PPWSA (Water Pipe)</li> <li>• Police (Traffic Control)</li> </ul>
2.0 Months	Make and Submit the Estimates	Each Organization
	Examine the Estimates	IRC
3.0 Months	Examine the Estimates	MEF (Ministry of Economy and Finance)
1.0 Month	Examine the Estimates	Prime Minister Office
1.0 Month	Approval of the Estimate	MEF
2.0 Months	Allocation of Budget	MEF
1.0 Month	Tender & Contract	Contractors & Each Organization
Total 14.0 Months	Relocation	Contractors & Each Organization

## Appendix 5 References

No.	Data Name	Type of Data Book/Vide o/Map/Pho to etc.	Original/C opy	Publication Agency	Publication Date
1	CLIMATE DATA YEARBOOK 2002	Report	Original	Department of Meteorology (DOM), Ministry of Water Resources and Meteorology (MWWRM)	June 2003
2	CLIMATE DATA YEARBOOK 2002 Part I	- do -	- do -	- do -	September 2003
3	Outline Report on the Dispersibility Study for the Fill Dams	- do -	- do -	International Commission on Large Dams (ICOLD)	-
4	Emergency Flood Rehabilitation Project Loan 1924-CAM (SF), PREK THNOT FLOOD RELIEF CHANNEL	- do -	- do -	MWRM, Mott MacDonald Ltd.	September 2001
5	Second Five-year Socio-economic Development Plan 2001-2005	- do -	- do -	Ministry of Industry (MOI)	July 2002
6	Public Investment Planning and Road Maintenance Program	- do -	- do -	Ministry of Public Works and Transport (MPWT)	1999
7	BENEFIT MONITORING AND EVALUATION REPORT	- do -	- do -	MPWT	March 2002
8	Topographic Maps (Scale:1/100,000)	Map	- do -	- do -	1997
9	Rainfall Data (1990-2001)	Electric Data	Copies	DOM, MWWRM	1990 - 2001
10	Water Level Data of the Mekong River (1960's to 2002)	- do -	- do -	Mekong River Commission (MRC)	-
11	STRENGTHENING THE MAINTENANCE PLANNING AND MANAGEMENT CAPABILITIES AT MPWT	Report	Original	MPWT	March 2002
12	LABOUR LAW	Book	- do -	Ministry of Social Affairs, Labour and Veteran Affairs	-
13	ROAD DESIGN STANDARD	- do -	- do -	MPWT	2003
14	BRIDGE DESIGN STANDARD	- do -	- do -	- do -	2003
15	CONSTRUCTION SPECIFICATION	- do -	- do -	- do -	2003
16	Contract S-111 R11B, Rehabilitation of National Road RN11 From KM 83.8 to KM 133.1	Report	- do -	- do -	May 2002
17	DRAWINGS for CONTRACT S-113 R21	- do -	- do -	- do -	February 2002
18	Asian Highway (AH) Classification and Design Standards	- do -	- do -	Economic & Social Commission for Asia & the Pacific, the United Nations (UN)	-

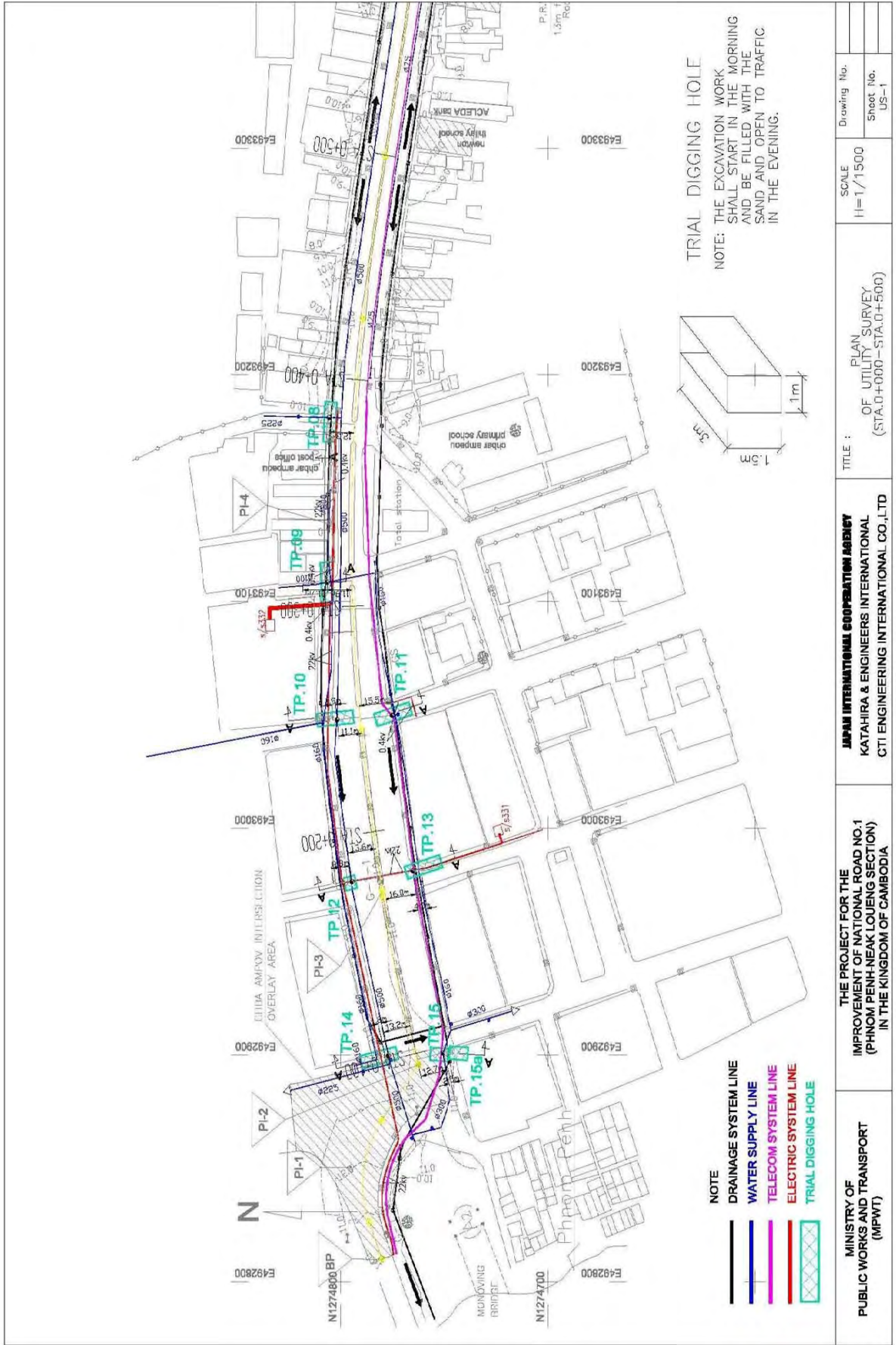


## **Appendix 6 Design Data**

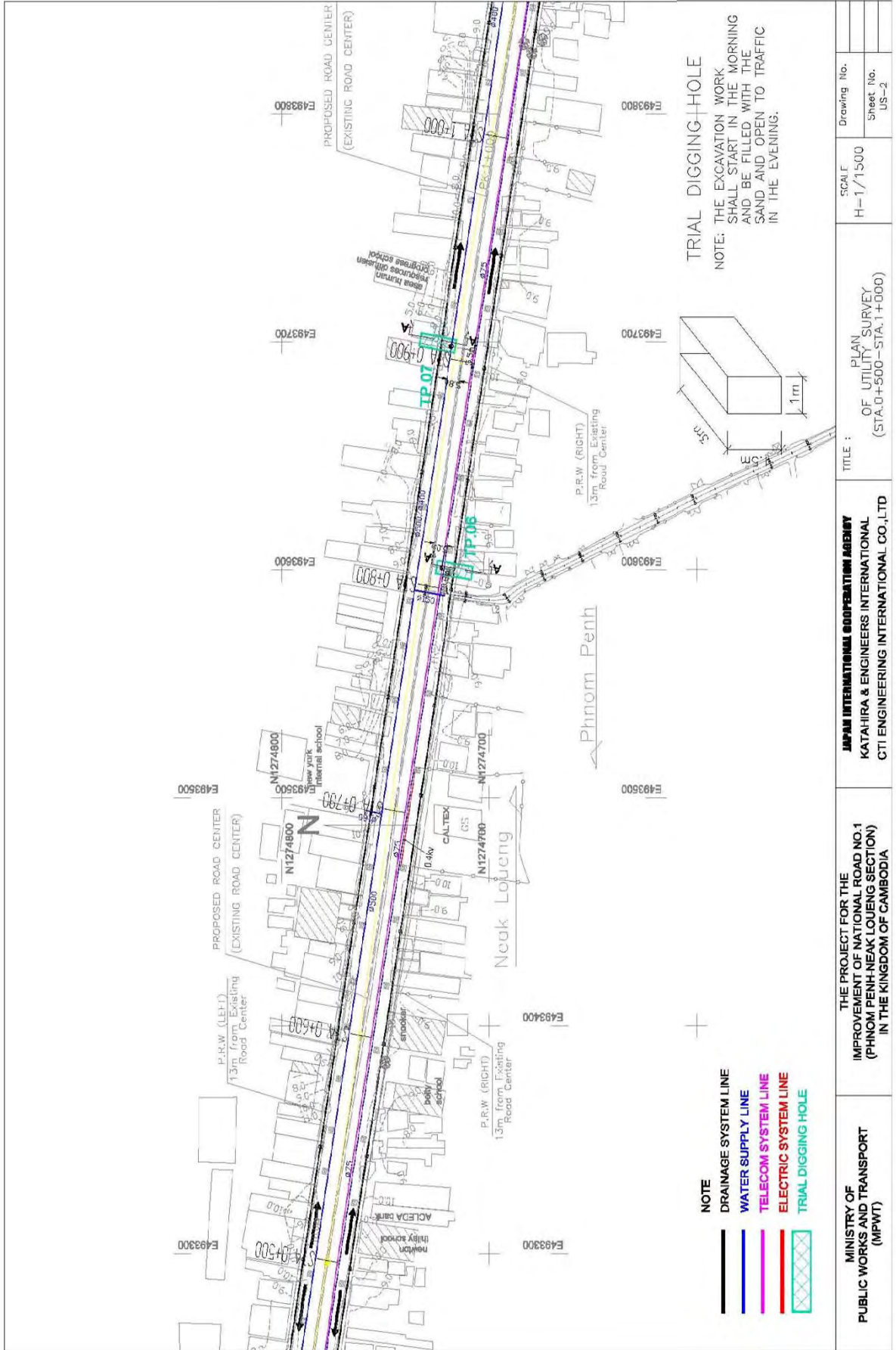
- (1) 2<sup>nd</sup> Monivong Bridge Construction Plan
- (2) Underground Utility Map (Prepared by trial excavation)
- (3) Proposed Water Purification Facility and Intake Facility Location Map
- (4) Underground Utility Relocation and Water Pipe Installation Plan







(2) Underground Utility Map(1/5)

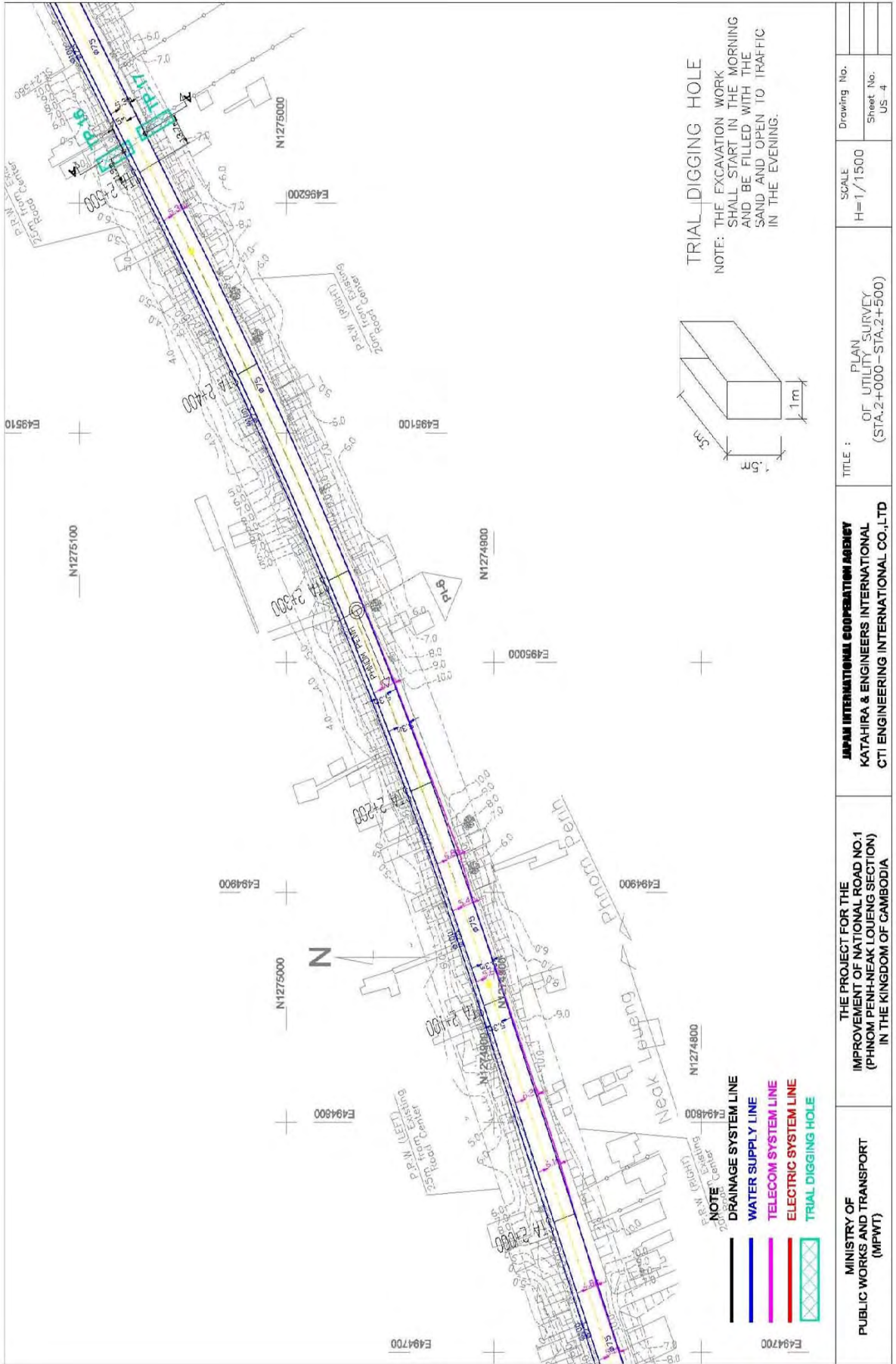


(2) Underground Utility Map (2/5)

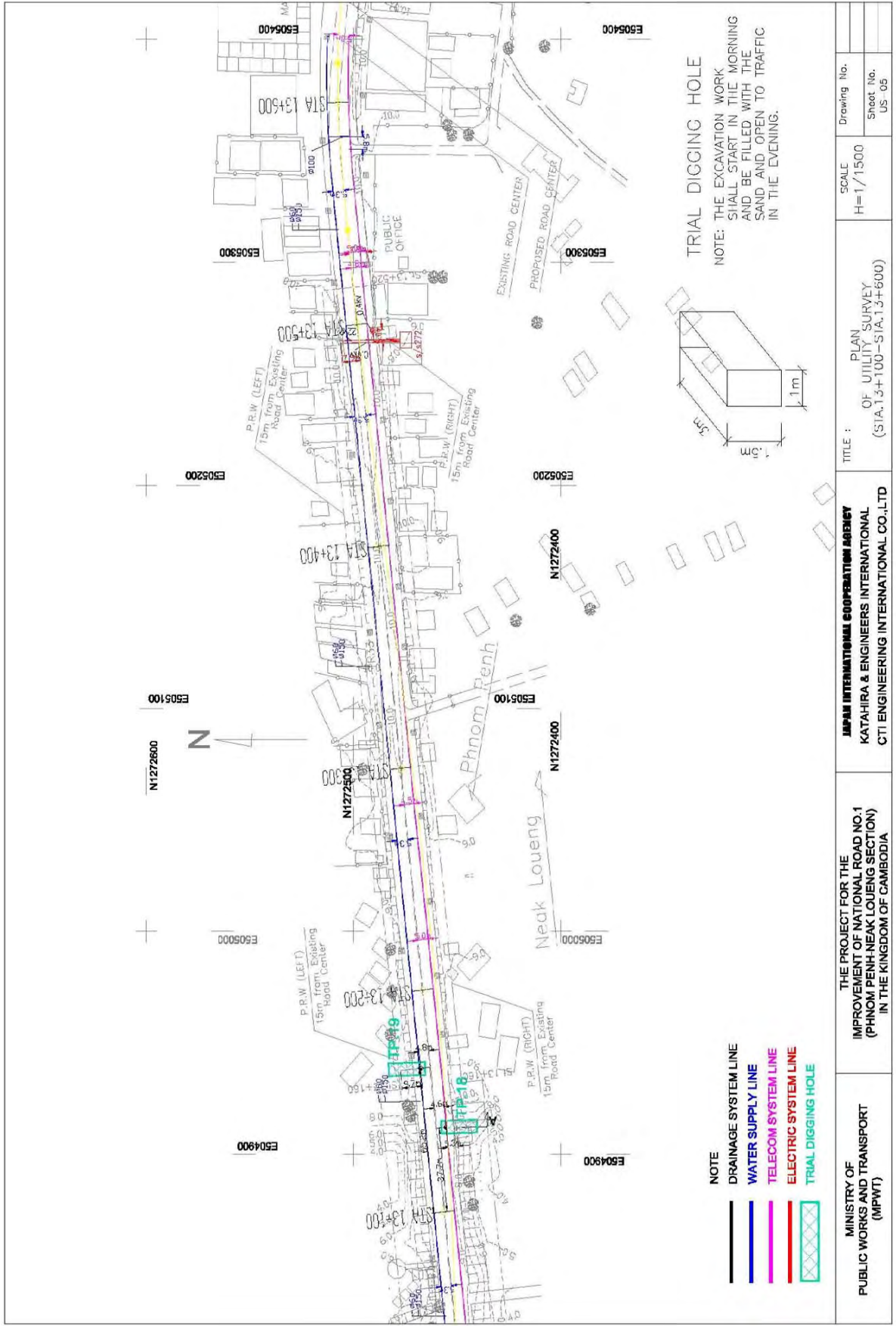


(2) Underground Utility Map (3/5)

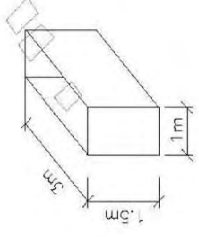




(2) Underground Utility Map (4/5)



**TRIAL DIGGING HOLE**  
 NOTE: THE EXCAVATION WORK SHALL START IN THE MORNING AND BE FILLED WITH THE SAND AND OPEN TO TRAFFIC IN THE EVENING.



- NOTE**
- DRAINAGE SYSTEM LINE
  - WATER SUPPLY LINE
  - TELECOM SYSTEM LINE
  - ELECTRIC SYSTEM LINE
  - ▭ TRIAL DIGGING HOLE

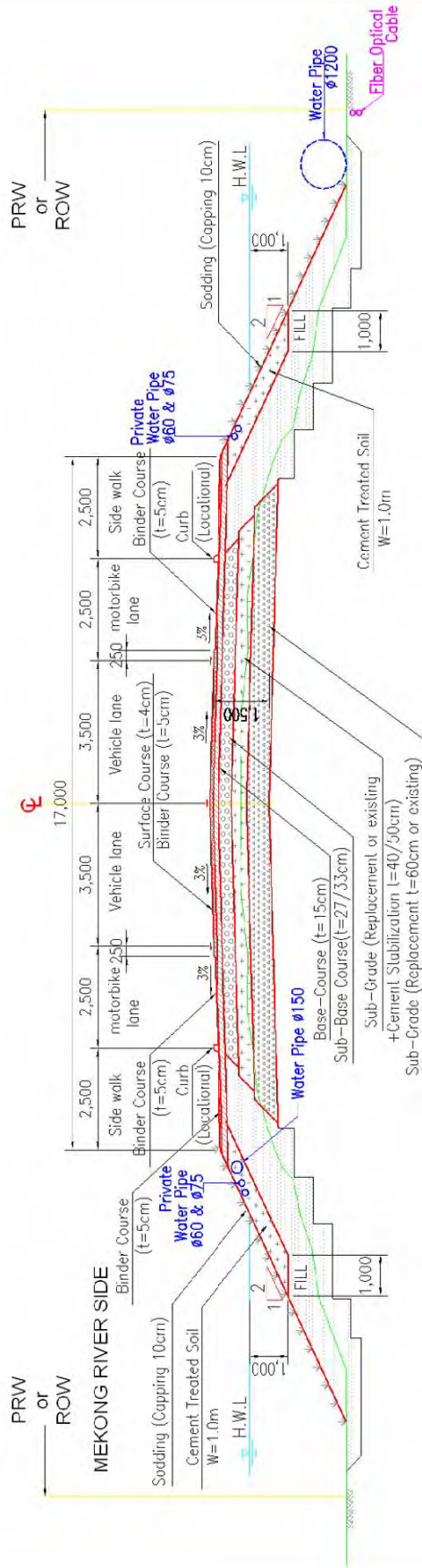
MINISTRY OF PUBLIC WORKS AND TRANSPORT (MPWT)	THE PROJECT FOR THE IMPROVEMENT OF NATIONAL ROAD NO.1 (PHNOM PENH-NEAK LOUENG SECTION) IN THE KINGDOM OF CAMBODIA	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL CTI ENGINEERING INTERNATIONAL CO.,LTD	TITLE : PLAN OF UTILITY SURVEY (STA.13+100--STA.13+600)	SCALE H= 1/1500	Drawing No.
				Sheet No. US-05	US-05

(2) Underground Utility Map (5/5)









**Type 3 2-LANES SECTION**  
(STA. 1+900 ~ 13+100)

MINISTRY OF PUBLIC WORKS AND TRANSPORT (MPWT)	THE PROJECT FOR THE IMPROVEMENT OF NATIONAL ROAD NO.1 (PHNOM PENH-NEAK LOUENG SECTION) IN THE KINGDOM OF CAMBODIA	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL CTI ENGINEERING INTERNATIONAL CO., LTD.	TITLE:	TYPICAL CROSS SECTION	SCALE	1:100	Drawing No.	
							Sheet No.	UL-2

(4) Underground Utility Relocation and Water Pipe Installation Plan