

フィリピン共和国  
公共事業道路省 (DPWH)

フィリピン国  
マニラ首都圏パラニャーケ放水路  
に係る情報収集・確認調査

ファイナル・レポート

第2巻：添付資料

平成30年5月  
(2018年)

独立行政法人 国際協力機構 (JICA)

株式会社 建設技研インターナショナル  
日本工営株式会社  
株式会社 建設技術研究所

環境

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## 報告書構成

第1巻：主報告書

第2巻：添付資料

本報告書で使用された為替レート  
1 US\$ = 50.84 PHP = 110.96 JPY  
1 PHP = 2.183 JPY  
2017年10月時点

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# 添付資料 1

添付資料 1-1 1<sup>st</sup> Steering Committee





# Data Collection Survey on Paranaque Spillway in Metro Manila

## Inception Meeting

August 2017



Japan International Cooperation Agency

CTI Engineering International Co., Ltd. (CTII)

Nippon Koei Co., Ltd. (NK)

CTI Engineering CO., LTD. (CTIE)

### ■ Topic

1. Background
2. Objectives and Outcomes
3. Counterpart Agencies and Steering Committee
4. Survey Area
5. History of Flood Management in Laguna de Bay
6. Comprehensive Flood Management Plan
7. Study on Paranaque Spillway
8. Method of Survey Implementation
9. Staffing and Reporting Schedule
10. Additional Issues (Paranaque Spillway)

# 1. Background

Typhoon Ondoy occurred in September 2009 and recorded the daily rainfall of 453 mm which caused massive flood damage in the area along the Marikina River and around the Laguna de Bay lakeshore area or even the whole Metro Manila area.

In the West Manggahan district located in the Laguna de Bay lakeshore area where measures were implemented in the project entitled “Metro Manila Flood Control Project – West of Manggahan Floodway”, about 80% of the low-lying residential areas were inundated for 1 to 3 weeks due to the influence of flooding caused by the overflow from the Marikina River, inland inundation, and the water level rise of Laguna de Bay. In the lakeshore area of Laguna de Bay, low-lying areas without flood management countermeasures widely spread and these areas experienced inundation for more than one month.

The flood management measures in the lakeshore area of Laguna de Bay are behind as compared to those implemented in the center of Manila, so that flood Management countermeasures are urgent matters to be addressed.



# 1. Background (Flood by Typhoon Ondoy)



## 2. Objectives and Outcomes

The objectives of this Survey are

1. to analyze the Laguna de Bay Basin including the Pasig Marikina River Basin in a unedified manner while aligning with the existing flood control projects and plans, to prepare **a comprehensive flood management plan of the entire Laguna de Bay lakeshore area,**
2. to conduct **the pre-feasibility study on the Paranaque Floodway (Pre-F/S)** as part of the comprehensive flood Management plan, and
3. to conduct the collection and confirmation of information to examine **the feasibility as Japan Yen loan project and the direction of the preparatory survey.**



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## 2. Objectives and Outcomes

The outcome of this Survey is as follows;

1. For the basic design of the Paranaque Spillway, the outcome can be utilized in considering to the F/S,
2. The outcome can be utilized in the basic plan and the basic design when DPWH acquires and implements approval in the Philippine government to conduct an additional investigation after this Survey.



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### 3. Counterpart Agency and Steering Committee

#### Counterpart Agency

Department of Public Works and Highways (DPWH)

#### Steering Committee of the Survey

DPWH shall head Steering Committee and coordinate the Survey with concerned agencies for the smooth implementation of the Survey. Member of Steering Committee as follows;

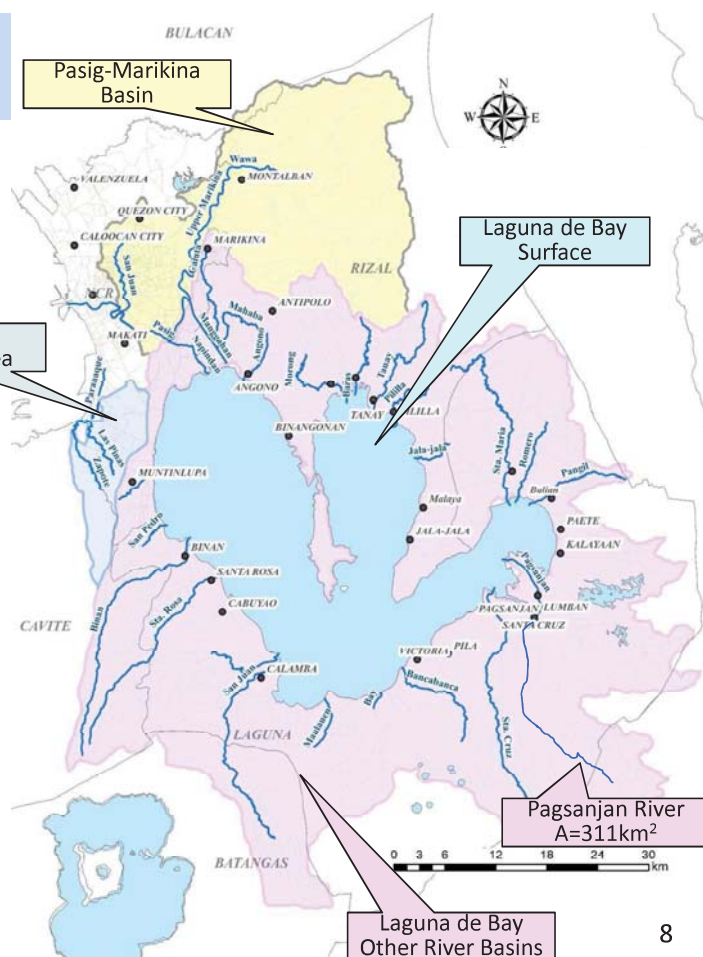
- a) DPWH (Chair and member)
- b) Representative(s) from Laguna Lake Development Authority (LLDA)
- c) Representative(s) from Metro Manila Development Authority (MMDA)
- d) Representative(s) from National Economic and Development Authority (NEDA)
- e) Representative(s) from Department of the Interior and Local Government (DILG)
- f) Representative(s) from Department of Environment and Natural Resources (DENR)
- g) Representative(s) from Department of Science and Technology (DOST)
- h) JICA Survey Team
- i) JICA Headquarters and JICA Philippines Office



### 4. Survey Area

The entire lakeshore area of Laguna de Bay in the Philippines (Metro Manila and surrounding areas)

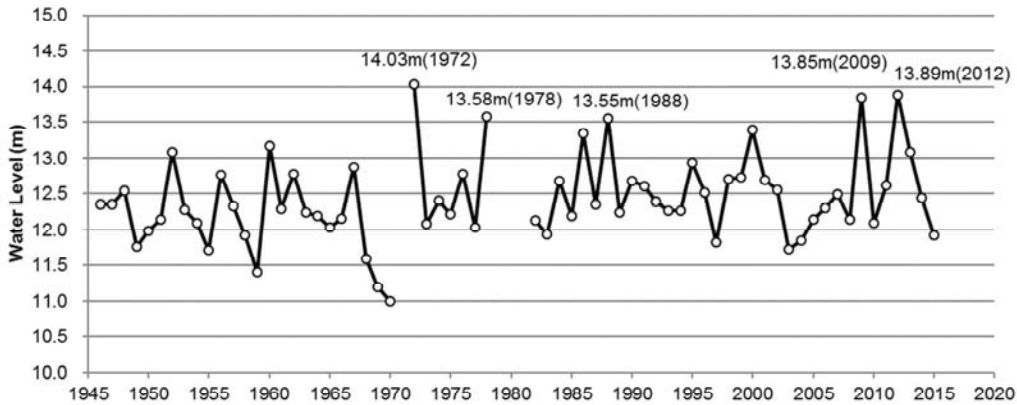
Catchment	Area (km <sup>2</sup> )
<b>Laguna de Bay Basin</b>	<b>3,280</b>
Laguna de Bay Surface	900
Other River basins	2,380
<b>Pasig-Marikina River Basin</b>	<b>640</b>
Marikina River Basin	538
Pasig River basin	102
<b>Paranaque-Las Pinas Area</b>	<b>74</b>



# 5. History of Flood Management in Laguna de Bay

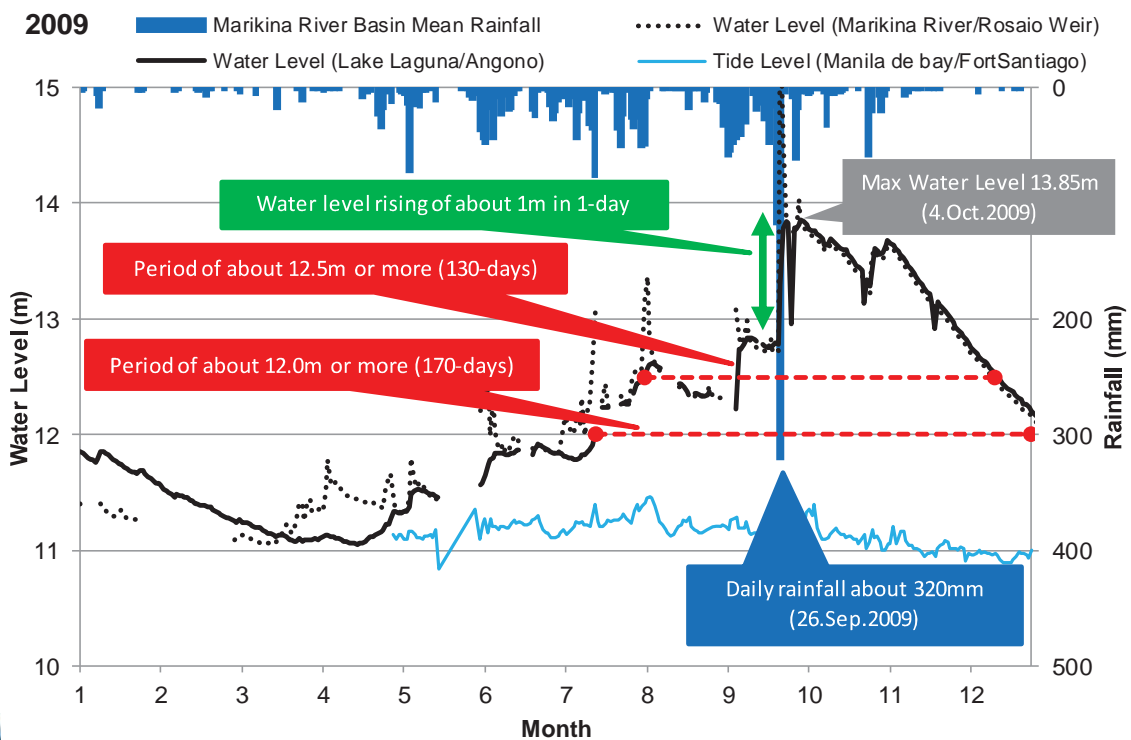
Major Flood Events in Laguna de Bay

No.	Year	Highest Water Level	Water Level (m) and Period of Days			Maximum 2-day Rainfall in Laguna Lake Basin	First date of the Maximum 2-day Rainfall	Water Level (m)	
			H>12.5	H>13.0	H>13.5			Before the Storm	After the Storm
1	1972	14.03	87	66	39	N/A	N/A	N/A	N/A
2	2012	13.89	114	75	27				
3	2009	13.85	108	65	38	286	9/25	12.73	13.77
4	1978	13.58	60	42	8	221	10/8	12.46	12.40
5	1988	13.55	48	24	4	189	10/24	12.02	12.97



# 5. History of Flood Management in Laguna de Bay

Flood Event in Laguna de Bay by Typhoon Ondoy and Typhoon Pepeng in 2009



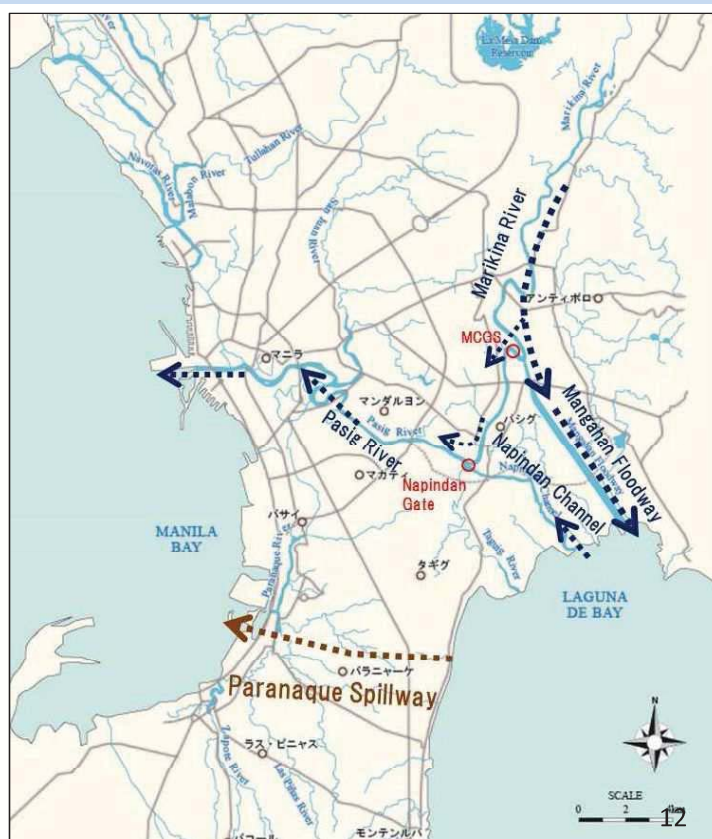
## 5. History of Flood Management in Laguna de Bay

First Half of 1970's	The Comprehensive Flood Management Plan for Manila Metro Area and the Laguna de Bay Lakeshore areas was planned (The plan included construction of the <b>Manggahan Floodway</b> and <b>Marikina Control Gate Structure (MCGS)</b> to divert the large volume of flood water from the Marikina River to Laguna de Bay, construction of the <b>Napindan Hydraulic Control Gate</b> , and construction of <b>the Paranaque Spillway and improvement of the Pasig-Marikina Rivers</b> to reduce the high water level of Laguna de Bay).
1983	Completion of Napindan Hydraulic Control Structure, supported by ADB
1988	Completion of the Manggahan Floodway (Floodway length: approximately 9km, supported by Japan)
	Other measures were not implemented due to the problems such as funds, land and housing relocation, etc.
1990	Study on Flood Control and Drainage Project in Metro Manila (JICA)
	After the above project, "Pasig-Marikina River Channel Improvement Project" and F/S of "North Laguna Lakeshore Urgent Flood Control and Drainage Project" have been implemented.
2007	Completion of the flood control project in the West Manggahan District in Metro Manila (Construction of facilities including lakeshore dikes (approximately 10km), drainage facilities at 4 locations, and bridges at 2 locations.)
2012	Master Plan for Flood Management in Metro Manila and Surrounding Areas (Funded by World Bank) Proposed heightening the west dike of Laguna de Bay, heightening the lakeshore urban areas, improvement of the inflow river channels, the East Manggahan Floodway, the West Manggahan drainage improvement and land use control.

## 5. History of Flood Management in Laguna de Bay

### Manggahan Floodway

The flood water of the Pasig-Marikina River and Laguna de Bay were once flowing to Manila Bay. However, the completion of the Manggahan Floodway changed the hydrological system. From the viewpoint of Laguna de Bay side, the current hydrological system is that the large volume of flood water from the Marikina River is temporarily stored in Laguna de Bay, and the stored water is released via Napindan Channel and the Manggahan.





## 6. Comprehensive Flood Management Plan

### Full Menu of the Comprehensive Flood Management Plan (Primary Step)

Measures		Contents
Structural Measure	Control and Prevention of Water Level Rise	<ul style="list-style-type: none"> <li>Strengthening Discharge Capacity of Napindan Channel and Manggahan Floodway,</li> <li>Construction of Paranaque Spillway</li> </ul>
	Mitigation of Inundation Damage	<ul style="list-style-type: none"> <li>Construction of Lakeshore Dike</li> <li>Leveling of Major Cities/Municipalities</li> <li>Installation of Discharge Facility for Inland Flood (with Dike)</li> <li>River Improvement (21 Rivers Flowing into the Lake)</li> </ul>
Non-Structural Measure		<ul style="list-style-type: none"> <li>Discharge Operation for Lowering Water Level</li> <li>Inundation Map</li> <li>Land Use Regulation</li> <li>Resettlement of inhabitants at Lower Area</li> <li>Stipulation of Regulation Pond</li> </ul>



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## 7. Study on Paranaque Spillway

### Comparison of Underground Spillway Type and Open-cut Spillway Type

Case	Underground Spillway Type		Open-cut Spillway Type	
	Case 1: Non-pressure Tunnel	Case 2: Siphon Type	Case 3: Open Channel Type	Case 4: Box Culvert Type
Figure				
Concept	Tunnel connects existing rivers and/or channels with some tunnels under the road and/or hills. The most general type of the spillway.	Siphon discharges excess water using the pressure difference caused by the water head. Pumping discharge maybe required depending on the water level conditions.	Open channel type makes the construction cost relatively less. However, it comes with the issues of large compensation for land acquisition and number of the relocation of the houses.	The top of the channel proposed in Case 3 is covered applying the box culvert structure. The top area can be utilized as a road, a park and so on.
Tentative Evaluation for Paranaque Spillway	Water head difference between Laguna de Bay and Manila Bay is so small that the earth covering thickness at the top of the tunnel with gravity flow of water is not sufficient. ×	Siphon will do if pump drainage is installed at the discharge side. (The water head difference is not enough for the gravity flow of water.) ○	Compensation for land acquisition and relocation of houses are the big issues. Project cost can be high considering the amount of compensations. △	This case has the same issues with Case 3. In addition, the high construction cost and the high maintenance cost make this type almost infeasible. ×



○: Adequate, △: less adequate but possible, ×: Not adequate or not possible

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## 8. Method of Survey Implementation

### **【A】 Preparation Works and Consultation of Inception Report with JICA**

【A-1】 Domestic Preparation Works and Consultation of Inception Report with JICA

### **【B】 Comprehensive Flood Management Plan of Laguna de Bay Lakeshore Area**

【B-2】 Collection and Consolidation of Basic Data

【B-3】 Collection of Past Flood Damage and Information

【B-4】 Evaluation of the Existing Flood Management Plan and Activities

【B-5】 Rainfall Analysis

【B-6】 Set of Target Return Period and Target Rainfall

【B-7】 Set of Target Sea Level of Manila Bay

【B-8】 Runoff Analysis and Inundation Analysis of Entire Laguna Lake Basin Including Pasig-Marikina River Basin with Analysis of Lake Water Level



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## 8. Method of Survey Implementation

【B-9】 Proposal of Design Criteria

【B-10】 Proposal of Evaluation Criteria For Comprehensive Flood Management Plan of Laguna de Bay Lakeshore Area

【B-11】 Preliminary Survey of Non-Structural Measures

【B-12】 Proposal of Full Menu of Comprehensive Flood Management Plan of Laguna de Bay Lakeshore Area (Primary Step)

【B-13】 Preliminary Environmental and Social Analysis and Examination

【B-14】 Proposal of the Appropriate Project Evaluation Methods

【B-15】 Formulation of Comprehensive Flood Management Plan of Laguna de Bay

【B-16】 Selection of Priority Projects

【B-17】 Proposal of Implementation Framework and Operation and Maintenance Framework of Priority Projects

【B-18】 Preparation and Submission of Interim Report and Discussions with Related Officers



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## 8. Method of Survey Implementation

### 【C】 Pre-Feasibility Study of Paranaque Spillway

- 【C-19】 Basic Design of Major Structure Works and Design Standard Including Examination of the Possibility of Utilizing Japanese Technologies
- 【C-20】 Procurement and Construction Plan
- 【C-21】 Operation and Maintenance Cost
- 【C-22】 Environment and Social Consideration
- 【C-23】 Rough Project Cost Estimation and Economic Internal Rate of Return (EIRR)
- 【C-24】 Overall Project Schedule of the Paranaque Spillway
- 【C-25】 Verification of the Effectiveness of the Paranaque Spillway Project
- 【C-26】 Confirmation of the Burden by the Philippines side
- 【C-27】 Preparation and Submission of Draft Final Report and Discussion with Related Officers
- 【C-28】 Preparation and Submission of Final Report



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## 9. Staffing and Reporting Schedule

The Survey Team consists of 14 Japanese.

The following reports are to be prepared and submitted to the agencies concerned.

- Interim Report: December 2017
- Draft Final Report: March 2018
- Final Report: May 2018

Position	Name	Company	FY 2017											FY 2018		
			Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun		
Team Leader/ Flood Control Measure (1)	Takahiro Mishina	CTII		■	■	■	■	■	■	■	■	■	■			
Co-team Leader/ Flood Control Measure (2)/ Structural Design (2)	Satoshi Takata	CTII		■	■	■	■	■	■	■	■	■	■			
Drainage Plan	Akio Shichijugari	CTII		■	■	■	■	■	■	■	■	■				
Non-structural Measure	Takashi Furukawa	CTII				■	■	■	■	■	■	■				
Hydro-Hydraulic Analysis (1)	Makoto Kudo	CTIE		■	■	■	■	■	■	■	■	■				
Hydro-Hydraulic Analysis (2)	Emi Sugino	CTII		■	■	■	■	■	■	■	■	■				
Coastal and Natural Environment Evaluation	Yuta Nakayama	NK		■	■	■	■	■	■	■	■	■				
Structural Design (1)	Eiji Moki	CTII		■	■	■	■	■	■	■	■	■				
Mechanical Design	Taro Ueno	NK				■	■	■	■	■	■	■				
Procurement and Construction Plan	Michihiro Abe	NK				■	■	■	■	■	■	■				
Cost Estimation	Tatsuji Ito	CTII				■	■	■	■	■	■	■				
Operation and Maintenance Plan / Institution and Financial Analysis	Tadahiro Fukuda	NK		■	■	■	■	■	■	■	■	■				
Environment and Social Consideration	Hitoshi Sakai	CTII			■	■	■	■	■	■	■	■				
Economic Analysis/ Project Evaluation	Takeshi Murakami	NK		■	■	■	■	■	■	■	■	■				
	Reporting (Δ: Submission)			△					△				△		△	

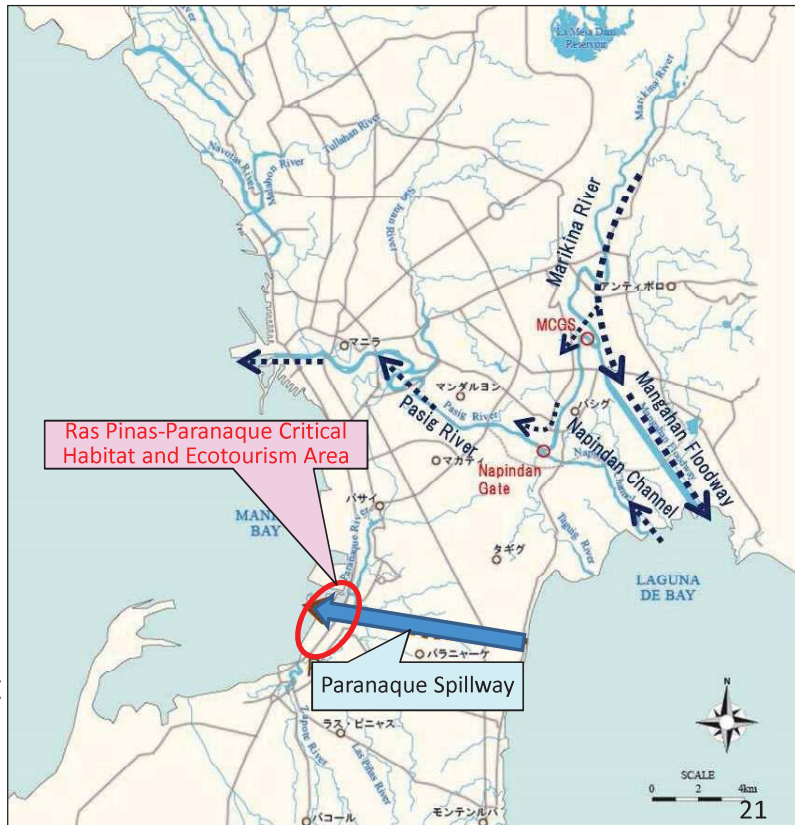


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## 10. Additional Issues (Paranaque Spillway)

It is essential to consider the environment during design of the Paranaque Spillway, there are islands called Freedom Island in Manila Bay. The islands and the inner bay area designated as a natural reserve “**Las Piñas-Paranaque Critical Habitat and Ecotourism Area (LPPCHEA)**”.

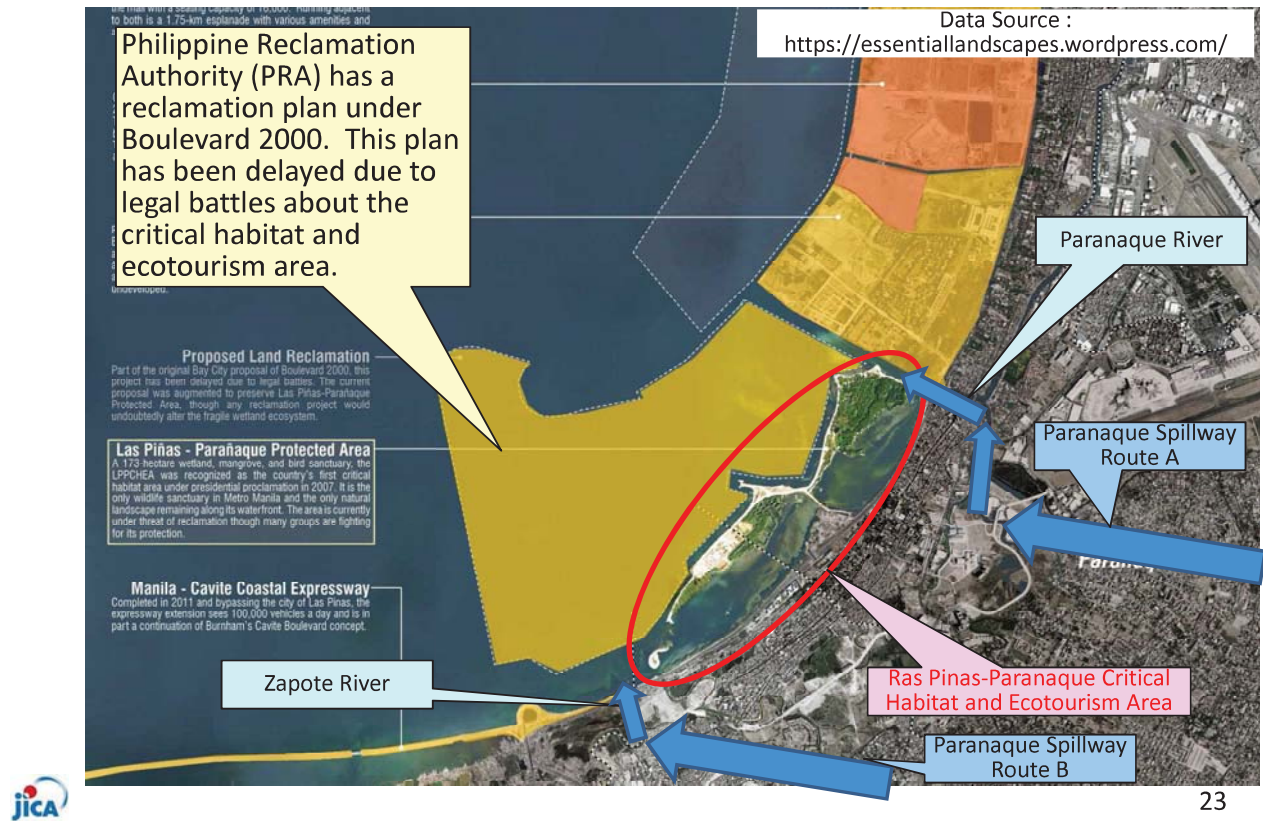
Since it is the registration site of Ramsar Convention (March 15, 2013), it is necessary to pay sufficient attention for the selection of the drainage outlet of the Spillway.



## 10. Additional Issues (Paranaque Spillway)



# 10. Additional Issues (Paranaque Spillway)



Thank you so much  
for your Attention !!





22 AUG 2017

**SPECIAL ORDER** )  
No. **102** )  
Series of **2017** )

**SUBJECT: CREATION OF A STEERING COMMITTEE FOR THE  
JICA-ASSISTED DATA COLLECTION SURVEY ON  
PARAÑAQUE SPILLWAY IN METRO MANILA**

To ensure the effective and coordinated implementation of the Data Collection Survey on Parañaque Spillway in Metro Manila, a Steering Committee is hereby created with the following composition:

1. **EMIL K. SADAIN, CESO II** - Chairperson  
Undersecretary for UPMO Operations
2. **MARIA CATALINA E. CABRAL, Ph.D.** - Co-chairperson  
Undersecretary for Planning and PPP
3. **PATRICK B. GATAN, CESO III** - Member  
Project Director, Flood Control Management Cluster
4. **MELVIN B. NAVARRO** - Member  
Regional Director for NCR
5. **SAMSON L. HEBRA** - Member  
Regional Director for Region IV-A
6. **DANTE B. POTANTE** - Member  
Director, Bureau of Design
7. **CONSTANTE A. LLANES, JR.** - Member  
Director, Planning Service
8. **ROBERTO S. SORIANO, Ph.D.** - Member  
Director, UP - National Hydraulic Research Center
9. Laguna Lake Development Authority (LLDA) - Member  
Representative
10. Metro Manila Development Authority (MMDA) - Member  
Representative
11. National Economic and Development Authority (NEDA) - Member  
Representative
12. Department of Interior and Local Government (DILG) - Member  
Representative
13. Department of Environment and Natural Resources (DENR) - Member  
Representative
14. Department of Science and Technology (DOST-PAGASA) - Member  
Representative
15. Department of Science and Technology (DOST-PHIVOLCS) - Member  
Representative

- |  |   |        |
|--|---|--------|
| 16. Japan International Cooperation Agency (JICA)<br>Headquarters and JICA Philippines Office Representative | - | Member |
| 17. DPWH - JICA Flood Management Expert  | - | Member |
| 18. Local Government Unit of Parañaque City<br>Representative  | - | Member |
| 19. Local Government Unit of Las Piñas City<br>Representative  | - | Member |

The main functions of the Steering Committee are as follows:

- a. Monitor the progress of the Study;
- b. Review and evaluate the results and recommendations of the Study;
- c. Provide guidance and resolve issues/constraints that may arise during the course of the Study; and
- d. Ensure the success and desired outcome of the Study.

The Steering Committee may invite other DPWH officials/personnel or other concerned agencies and entities to participate and/or provide assistance in the conduct of the Study, as the need arises.

This order shall take effect immediately.

  
**MARK A. VILLAR**  
Secretary

2.5 PBG/EKS

Department of Public Works and Highways  
Office of the Secretary



WIN7V17493



Republic of the Philippines  
Department of Public Works and Highways  
Manila

**Title/Description: FIRST STEERING COMMITTEE MEETING FOR THE DATA COLLECTION SURVEY ON PARAÑAQUE SPILLWAY IN METRO MANILA**

**Minutes of Meeting**

Date:	Started	Adjourned	Venue
August 17, 2017	2:00 P.M.	4:30 P.M.	Marigold Conference Room, 3rd floor, The Bayleaf Intramuros, Muralla cor. Victoria Streets, Intramuros, Manila
<b>Attendees:</b> Please see attached marked "ANNEX 1"		<b>Topics:</b>	
		<ol style="list-style-type: none"> <li>1. Concept of the Survey</li> <li>2. Affected People and Areas by the Expected Project</li> <li>3. Hydraulic Model</li> <li>4. Design of Parañaque Spillway</li> <li>5. Flow Capacity and Target Return Period</li> <li>6. Effect to the On-going Project and Existing Structures</li> <li>7. Construction Methods</li> <li>8. Following Schedule</li> </ol>	

Topic	Session Highlights and Discussion	Person Responsible
	<p>In accordance with the TOR of the Data Collection Survey on Parañaque Spillway in Metro Manila (hereinafter referred to as "the Survey") and the Minutes of Discussion agreed upon by and between the Department of Public Works and Highways (hereinafter referred to as "DPWH") and the Japan International Cooperation Agency (hereinafter referred to as "JICA") signed on May 9, 2017, a 1<sup>st</sup> Steering Committee Meeting was held to deliberate on the contents of the Inception Report (hereinafter referred to as "IC/R") on August 17, 2017. The Meeting was chaired by Mr. Emil K. Sadain, Undersecretary for UPMO Operations, DPWH, and the attendees are as listed in the Annex 1.</p> <p>The contents of the IC/R were explained by Mr. Takahiro Mishina, the Leader of the JICA Survey Team, and discussions were made. The principal items discussed and/or concluded in the Meeting are as summarized below:</p>	
1. Concept of the Survey	<ul style="list-style-type: none"> <li>• Usec. Sadain called the meeting into order at 2:30 P.M.</li> <li>• He explained the importance of a Comprehensive Flood Management Plan for Laguna de Bay Lakeshore Area and the Parañaque Spillway. He requested the cooperation of different national government agencies (hereinafter referred to as "NGAs") and local government units (hereinafter referred to as "LGUs") regarding the collection and update of data for the nine-month Survey.</li> </ul>	

	<ul style="list-style-type: none"> <li>Former DPWH Usec. Teodoro Encarnacion agreed that a Comprehensive Flood Management Plan of Laguna de Bay Lakeshore Area was a good way to update and capture all current projects.</li> </ul>	
2. Affected People and Areas by the Expected Project	<ul style="list-style-type: none"> <li>Usec. Sadain asked if the JICA Survey Team takes into consideration the Informal Settler Families (ISF) that will be affected by the Parañaque Spillway and the requirement of relocation. <ul style="list-style-type: none"> <li>Mr. Mishina answered that the JICA Survey Team had already started the discussion with Laguna Lake Development Authority (LLDA) about this issue and would consider them especially the estimated 200,000 people living below the 12.5 m, but not all of them. Mr. Mishina also mentioned that further discussion and study on how to appropriately manage this would be required.</li> </ul> </li> <li>Ms. Lennie Santos-Borja from Laguna Lake Development Authority (LLDA) recommended that the Survey Team should discuss with the LGUs regarding the best way to deal with the ISF concern.</li> <li>Former DPWH Usec. Encarnacion pointed out that the Parañaque Spillway should use public property like roads, rivers and underground with the provisions of RA 10752 which says that land 50 meters below the ground is considered to be a government land.</li> <li>Former DPWH Usec. Encarnacion clarified that relocation as well as provision of relocation sites for the ISF is the responsibility of the LGUs.</li> <li>Ms. Florentino Jhellouin B. De Leon, Office of the City Engineer of Parañaque suggested the JICA Survey Team to meet the Mayor of Parañaque as soon as the affected areas of Parañaque Spillway are identified. <ul style="list-style-type: none"> <li>Mr. Mishina, on behalf of the survey team expressed their willingness to meet the Mayor to discuss the alternatives of the Parañaque Spillway.</li> </ul> </li> <li>Ms. Bernadette Dela Cruz from City of Las Piñas asked about the effect of Parañaque Spillway to the city of Las Piñas, especially to Zapote River which has less flow capacity. <ul style="list-style-type: none"> <li>Project Manager Leonila R. Mercado, of DPWH-UPMO-FCMC mentioned that they would coordinate with the LGU of Las Piñas to discuss the issue and the details of data collection.</li> </ul> </li> </ul>	JICA Study Team
3. Hydraulic Model	<ul style="list-style-type: none"> <li>Ms. Santos-Borja suggested the JICA Survey Team to discuss the hydraulic model and its scenarios since LLDA was updating their model incorporating</li> </ul>	JICA Study Team



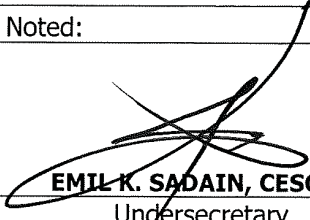


	<p>the three big water bodies such as Pasig River, Marikina River and Laguna de Bay. She made the following remarks:</p> <ul style="list-style-type: none"> <li>i. LLDA is currently revising their Zoning and Management Plan for Fisheries. They have zoned the whole Laguna de Bay and would like to determine if any of their production zones will be affected by the alignment/inlet of the Parañaque Spillway during construction and operation phases. She pointed out that the western part of the lake is the most productive for fishery.</li> <li>ii. LLDA informed that they will also hold a forum with the NGAs who have projects (current or future) in Laguna de Bay in order to consolidate all information that might have impact on their Zoning and Management Plan.</li> </ul> <p>➤ Mr. Mishina and Project Manager Mercado replied that they would coordinate with LLDA regarding the matter.</p>	
<p>4. Design of Parañaque Spillway</p>	<ul style="list-style-type: none"> <li>• Engr. Marceliano A. Carlota II from Bureau of Design (BOD) of DPWH asked if the Parañaque Spillway can be used as a road tunnel similar to Storm-water Management and Road Tunnel (SMART) in Kuala Lumpur, Malaysia.</li> </ul> <p>➤ Mr. Mishina clarified that the proposed spillway would be 50-meter below the ground and is too deep to utilize for transport purposes. However, if it is shallow tunnel type, it can be considered.</p> <ul style="list-style-type: none"> <li>• Dr. Arturo Daag from PHIVOLCS asked if the JICA Survey Team considered the potential salt water intrusion or backflow to Laguna de Bay from Manila Bay and the West Valley Fault.</li> </ul> <p>➤ Mr. Mishina responded that JICA Survey Team would propose the gates at both Manila Bay and Laguna de Bay considering the tidal schedules of both.</p>	
<p>5. Flow Capacity and Target Return Period</p>	<ul style="list-style-type: none"> <li>• Engr. Maximo M. Montaña II from Planning Service of DPWH asked whether JICA Survey Team considered the inflow from Pasig-Marikina River.</li> </ul> <p>➤ Mr. Mishina replied that JICA Survey Team would consider a large amount of flood water inflow from the surrounding river basins including Pasig River basin and Marikina River basin into Laguna de Bay such as the 900 Million cubic meter, equivalent to the water amount caused by one-meter surge of the water level at Laguna de Bay. It is impossible to discharge such large amount through the spillway, hence, the structures including the Parañaque Spillway and</p>	

	<p>surrounding dikes would be studied in order to minimize the flooding damages.</p> <ul style="list-style-type: none"> <li>• Project Manager Dolores M. Hipolito, Project Manager III of DPWH-UPMO-FCCM asked the particular return period to be considered in the study with climate change projection. She also pointed out that DPWH is working on a 25-yr return period that can contain a 50-yr flood design for the projects within twenty-one (21) surrounding river basins and that the increased conveyance capacity of the rivers would hasten the inflow to the lake after the completion of the improvement. <ul style="list-style-type: none"> <li>➢ Mr. Mishina answered that JICA Survey Team would discuss with UPMO on the return period of the 21 river basins as well as the PAGASA projected sea level rise.</li> </ul> </li> <li>• Former Usec. Encarnacion clarified the target return period of rainfall to be used in the study. <ul style="list-style-type: none"> <li>➢ Mr. Mishina answered that the JICA Survey Team was tentatively considering the 100-year return period.</li> </ul> </li> </ul>	
<p>6. Effect to the On-going Project and Existing Structures</p>	<ul style="list-style-type: none"> <li>• Mr. Tiburcio Canlas, Assistant Regional Director of DPWH-NCR expressed his concern on the connection with the on-going projects by the Metro Manila II District Engineering District in the Parañaque River. He cited the existing protruding wall pilings of the NAIA Expressway in the river that may affect the conveyance capacity of the spillway. <ul style="list-style-type: none"> <li>➢ Mr. Mishina answered that the JICA Survey Team would visit his office to discuss the spillway plan.</li> </ul> </li> <li>• Usec. Sadain clarified if the JICA Survey Team considered the alignment of the Mega Manila Subway Project of the Department of Transportation (DOTr), and even inquired on the possible impact of the spillway project with the Laguna Lake Expressway Dike Project (hereinafter referred to as "LLEDP"). <ul style="list-style-type: none"> <li>➢ Mr. Mishina answered that JICA Survey Team would collect the data on the Mega Manila Subway alignment and further mentioned that a meeting with DPWH Planning and Design Division and PPP is requested to further discuss the LLEDP.</li> </ul> </li> <li>• Ms. Santos-Borja inquired whether the Survey would show with and without LLEDP scenario for the Parañaque Spillway since there was no definite decision on the LLEDP wherein bidding process had been previously postponed. She called on her colleague, Engr. Jun Paul U. Mistica, to inform the body regarding the on-going talks on a multi-modal transport system being pushed by Sen. Manny</li> </ul>	



	<p>Pacquiao with the Pasig River Rehabilitation Commission (PRRC). The proposed project aims to utilize the 10-meter embankment of the Pasig River as a multi-modal transport (monorail or LRT) that would extend to the Laguna Lake and Calamba.</p> <ul style="list-style-type: none"> <li>➤ Mr. Mishina replied that JICA Survey Team is still on the data collection and will consider all other information.</li> <li>• Project Manager Hipolito inquired the possible impact of the Parañaque Spillway to the current users of the Laguna Lake such as fish pens.</li> <li>➤ Mr. Mishina answered that JICA Survey Team would discuss about the quality and the quantity of the discharge amount from Laguna de Bay with LLDA and NEDA.</li> <li>• Ms. Santos-Borja inquired the distance from the outlet of the Parañaque Spillway to the Maynilad Water Treatment Facility. Maynilad is currently planning to upgrade their facility and increase their current extraction permit of 300 Million liters/day.</li> <li>➤ Mr. Mishina responded that JICA Survey Team will consider the matter.</li> </ul>	
7. Construction Methods	<ul style="list-style-type: none"> <li>• Engr. Montaña II asked whether JICA Survey Team considered the construction method that would provide the least disruption along the construction areas, especially at the highway and residential areas.</li> <li>➤ The Study Team answered that JICA Survey Team would also consider the aspect.</li> </ul>	JICA Study Team
8. Following Schedule	<ul style="list-style-type: none"> <li>• Usec. Sadain informed that the UP National Hydraulic Research Center (NHRC) would be invited in the next meeting which was tentatively scheduled on the 1st week of October. DPWH-UPMO would disseminate the next meeting schedule and venue.</li> <li>• With no more matters to discuss, the meeting was adjourned at 4:30 P.M.</li> </ul>	JICA Study Team

<b>Review and Confirmation:</b>		
Prepared by:	Approved by:	Noted:
 <b>TAKAHIRO MISHINA</b> Project Team Leader JICA Survey Team	 <b>PATRICK B. GATAN, CESO III</b> Project Director UPMO - FCMC	 <b>EMIL K. SADAIN, CESO II</b> Undersecretary for UPMO Operations

## **ANNEX 1 ATTENDANCE SHEET**

No.	Name	Position / Company
1.	Usec. Emil K. Sadain	DPWH - UPMO
2.	Teodoro T. Encarnacion	DPWH Central Office
3.	Mauricio Mapa	DPWH Central Office
4.	Rogelio O. Ang	DPWH - UPMO
5.	Dolores M. Hipolito	DPWH - UPMO-FCMC
6.	Leonila R. Mercado	DPWH - UPMO-FCMC
7.	Michael T. Alpasan	DPWH - UPMO-FCMC
8.	Lydia G. Barsolaso	Office of Usec Sadain
9.	Shirley O. Castro	Office of Usec Sadain
10.	Maximo M. Montaña II	DPWH - PPD, PS
11.	Marceliano A. Carlota II	DPWH - BOD
12.	Tiburcio L. Canlas	DPWH - NCR
13.	Liberato L. Requiona Jr.	DPWH - NCR
14.	Francisco N. Garces	DPWH - NCR-Metro Manila 2 <sup>nd</sup> DEO
15.	Jose T. de Leon Jr	DPWH - NCR-Metro Manila 2 <sup>nd</sup> DEO
16.	Yolanda L. Tango	DPWH - Region 4A
17.	Mary Jane Castillo	DPWH - Planning Service
18.	Jun Paul U. Mistica	LLDA
19.	Jocelyn G. Sta. Ana	LLDA
20.	Lennie Santos-Borja	LLDA
21.	Florentino Jhellouin B. de Leon	Parañaque Office of the City Engineer
22.	Engr. Ma.Teresa R. Quiogie	CENRO -City Government of Parañaque
23.	Michael Aguilar	LGU - Las Piñas
24.	Bernadette Dela Cruz	LGU - Las Piñas
25.	Willy Ratunan	DENR - EMB-NCR
26.	Arturo Daag	PHILVOCS
27.	Yoko Yoshida	JICA Philippines Office
28.	Ayumu Ohshima	JICA Philippines Office
29.	Rio Aguchi	JICA Philippines Office
30.	Catherine Palanca	JICA Philippines Office
31.	Takahiro Mishina	JICA Survey Team
32.	Satoshi Takata	JICA Survey Team
33.	Akio Shichijugari	JICA Survey Team
34.	Eiji Moki	JICA Survey Team
35.	Emi Sugino	JICA Survey Team
36.	Tadahiro Fukuda	JICA Survey Team
37.	Takeshi Murakami	JICA Survey Team
38.	Yuta Nakayama	JICA Survey Team
39.	Makoto Kudo	JICA Survey Team
40.	Geraldine Santos	JICA Survey Team
41.	Eleazar N. Rupido	JICA Survey Team
42.	Riza S. Nanas	JICA Survey Team
43.	Hitoshi Kin	CTII

