Concerns on the Design of Temporary East Pump Station in terms of Safe Construction, Operation and Maintenance

The following concerns are presented by the team only for consideration of Indonesian side in order to make sure that the Temporary East Pump Station can play expected role without damage until implementation of the Project. Indonesian side can review their design in consideration of these concerns under their own responsibility.

I. Discharge Piping System

1. Stop Logs

Stop logs have been provided to prevent the intrusion of sea water into the dry area in case of emergency. Stop logs shall be considered as Secondary Sea Dike/Wall. For the design of stop log system, the following matters to be considered:

(1) Guides for Stop Logs

Guides for Stop Logs shall be carefully provided so as not to reduce the strength of existing concrete structure. Guides shall be provided for walls and bottom slab.

(2) Stop Logs

Stop Logs shall be of steel with sufficient strength and watertightness against sea water pressure.

2. Sea Dike

In consideration of the nature of rehabilitation works as temporary measure for duration less than two years, water discharge pipes have been installed through Sea Dike made of masonry concrete. However, Sea Dike shall be strong and stable enough against sea water pressure with watertightness. These shall be verified by calculation. Stability of Sea Dike shall be secured by gravity; however, it seems that the shape and weight of present Sea Dike is not sufficient.

3. Measures against Differential Settlement of structure

There is no flexible joint installed in the present discharge pipe system. To prevent from the excessive damage to the pipes and structure due to differential settlement of ground, the following periodical monitoring can be carried out:

(1) Measurement of deformation of pipes

Level gauges can be installed on discharge pipes upon completion of the works. Monitoring of the changes in level gauges will provide indication on deformation or strain of pipes.

(2) Examination of pipe joints

Joints between pipes either welded or flanged can be examined in view of unusual deformation.

(3) Examination of water leakage through Sea Dike

Visual inspection of Sea Dikes on cracks and water leakage can be recommended.

4. Prevention of Backward Flow in Discharge Pipes

Backward flow in discharge pipes at the time of stoppage of pumps can be prevented by flap valve installed at the mouth of outlet discharge pipe; however watertight closure of flap valve may sometimes be blocked by foreign objects. Therefore, it is recommended that the discharge valve will also be closed at the same time.

II. Electrical System

(1) Urgent repair of the existing electrical room for East and Central Pump Stations, which had been damaged by piping at East Pump Station

(2) Necessary maintenance of the emergency generators in the generator room and the substation equipment in the electrical room including repair of meters and indication lamps of panels, repair of room lightings, etc.

AK

Minutes of Discussions

on

The Preparatory Survey

on

The Project for Urgent Reconstruction of East Pump Station of Pluit

In Jakarta, the Republic of Indonesia

(Explanation on Draft Report)

In response to a request from the Government of the Indonesia (hereinafter referred to as "GOI"), the Government of Japan (hereinafter referred to as "GOJ") decided to conduct a Preparatory Survey on the Project for Urgent Reconstruction of East Pump Station of Pluit in Jakarta, the Republic of Indonesia (hereinafter referred to as "the Project") in the Republic of the Indonesia (hereinafter referred to as "the Indonesia") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to the Indonesia the Preparatory Survey Team (hereinafter referred to as "the Team"), which is headed by Mr. Kenichi Tsukahara, Senior Adviser, JICA and is scheduled to stay in the country from 25th May to 1st June 2010.

The Team held discussions with the concerned GOI officials and conducted a field survey at the study area. In the course of discussions and field survey, both parties confirmed the main items described in the attached sheets.

Jakarta, 31st May, 2010

Mr. Kenichi Tsukahara
Leader,
Preparatory Survey Team,
Japan International Cooperation Agency

Mr. Widagdo
Director of River, Lake and Reservoir,
Directorate General of Water Resources,
Ministry of Public Works (PU)
Republic of Indonesia

Mr. Budi Widiantoro
Director of Public Works Department,
City of Jakarta
(DKI Jakarta)
Republic of Indonesia

ATTACHMENT

I. Components of the Draft Report

The Indonesian side agreed and accepted in principle the components of the Draft Report explained by the Team. The Indonesian side also agreed that the components of the Project will be determined by the Indonesian side and the GOJ based on the result of the survey.

II. Japan's Grant Aid scheme

The Indonesian side understands Japan's Grant Aid Scheme and the necessary measures to be taken by the GOI as shown in Annex-3.

III. Schedule of the Survey

The tentative implementation schedule is shown in Annex-1.
JICA will complete the final report in accordance with the confirmed items and send it to the GOI by August 2010.

V. Confidentiality of the Project

(1) Detailed Specifications
Both sides confirmed all the information related to the Project including detailed specifications of the facilities, equipment and other technical information shall not be released to any other party(ies) before the signing of all the Contract(s) for the Project.

(2)Project Cost Estimate
The Team explained to the Indonesian side the estimated project cost to be borne by the GOJ as attached in Annex -2. Both sides agreed that the Project Cost Estimate should never be duplicated in any form nor disclosed to any other party(ies) before the signing of all the Contract(s) for the Project. This confidentiality of the estimated project cost is necessary to ensure fairness of the tender procedure.

VI. Undertakings of GOI

(1)Access Road for Construction
Indonesian side (DINAS PU DKI Jakarta) agreed to secure the access road to the Project site during implementation of the Project before January 2011.

(2)Provision of Disposal Area of Demolished Construction Debris
Both sides confirmed that the demolishing work of the existing East Pump Station and transportation of construction debris to the designated disposal area will be undertaken by Japanese side.
Indonesian side (DINAS PU DKI Jakarta) agreed to provide the disposal area of demolished construction debris of the existing East Pump Station at own cost before January 2011 and take necessary measures regarding the final disposal and/or appropriate treatment, if necessary, according to the related law.

(3)Relocation of Anchored ships
Indonesian (DINAS PU DKI Jakarta) side agreed to relocate anchored ships by Indonesian side before January 2011.

(4)Relocation of Marine Police Station and related facilities

Indonesian (DINAS PU DKI Jakarta) side agreed to relocate Marine Police Station and related facilities at the west end of the existing Sea Tide Dike by Indonesian side before January 2011.

(5)Relocation of Power Receiving Facility

Indonesian (DINAS PU DKI Jakarta and PLN) side agreed to relocate PLN power receiving panel in the existing East Pump Station and related power cables to Central Pump Station by Indonesian side before January 2011.

(6)Alternate Drainage Facility during Reconstruction of East Pump Station

Indonesian (DINAS PU DKI Jakarta) side agreed to complete the installation of Duri pumps with drainage capacity of $6m^3/s$ before January 2011. Indonesian side (DINAS PU DKI Jakarta) also agreed that in case that Indonesian side can not complete the installation of Duri pumps before the above time limit, Indonesian side shall provide temporary pump units with total capacity of $6m^3/s$ instead as the alternate undertakings of the Indonesian side.

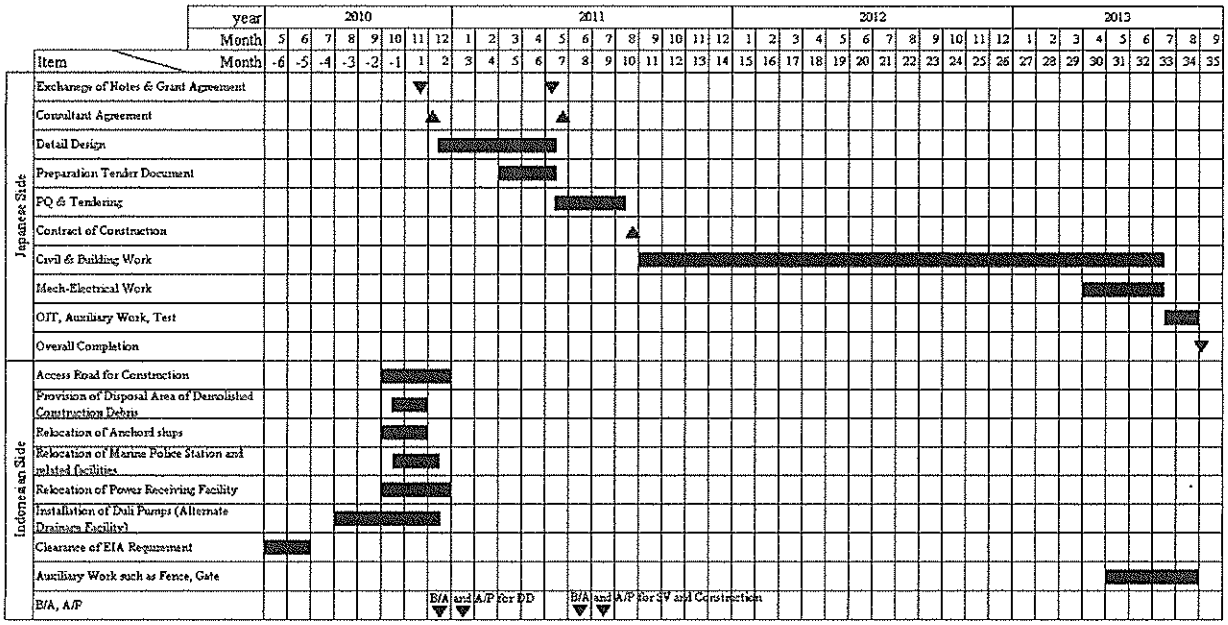
(7)Clearance of EIA Requirement

Indonesian (DINAS PU DKI Jakarta) side agreed to submit UKL and UPL to Jakarta Environmental Management Agency (hereinafter referred to as "BPLHD") for approval and to complete the submission of a copy of approval letter from BPLHD to the Team by the end of June 2010.

Annex -1 Tentative Implementation Schedule
Annex -2 Project Cost Estimation
Annex -3 Japan's Grant Aid Scheme

Annex-1

Tentative Implementation Schedule



Annex-2

Project Cost Estimation

(2) Cost to Be Borne by the Recipient Side
Estimated Project Cost: 170 million JPY

Organization	Item	Project Cost (million JPY)	
DINAS PU DKI Jakarta	Access Road for Construction	42	169
	Provision of Disposal Area of Demolished Construction Debris	N/A	
	Relocation of Anchord ships	N/A	
	Relocation of Marine Police Station and related facilities	3	
	Relocation of Power Receiving Facility	10	
	Installation of Duri Pumps(Alternate Drainage Facility)	107	
	Clearance of EIA Requirement	3	
	Explanation to Surrounding Residents on Construction	N/A	
	Auxiliary Work such as Fence, Gate	4	
DGWR PU	Commission to a Bank for Banking Arrangement and Authorization to Pay	1	1

JAPAN'S GRANT AID

The Government of Japan (hereinafter referred to as "the GOJ") is implementing the organizational reforms to improve the quality of ODA operations, and as a part of this realignment, a new JICA law was entered into effect on October 1, 2008. Based on this law and the decision of the GOJ, JICA has become the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

The Grant Aid is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

1. Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures :

- Preparatory Survey
  - The Survey conducted by JICA
- Appraisal &Approval
  - Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
  - The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as "the G/A")
  - Agreement concluded between JICA and a recipient country
- Implementation
  - Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the Preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Outline Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

3. Japan's Grant Aid Scheme

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes (hereinafter referred to as "the E/N") will be singed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use properly and effectively the facilities constructed and the equipment purchased under the Grant Aid, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant Aid.

(7) "Export and Re-export"

The products purchased under the Grant Aid should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

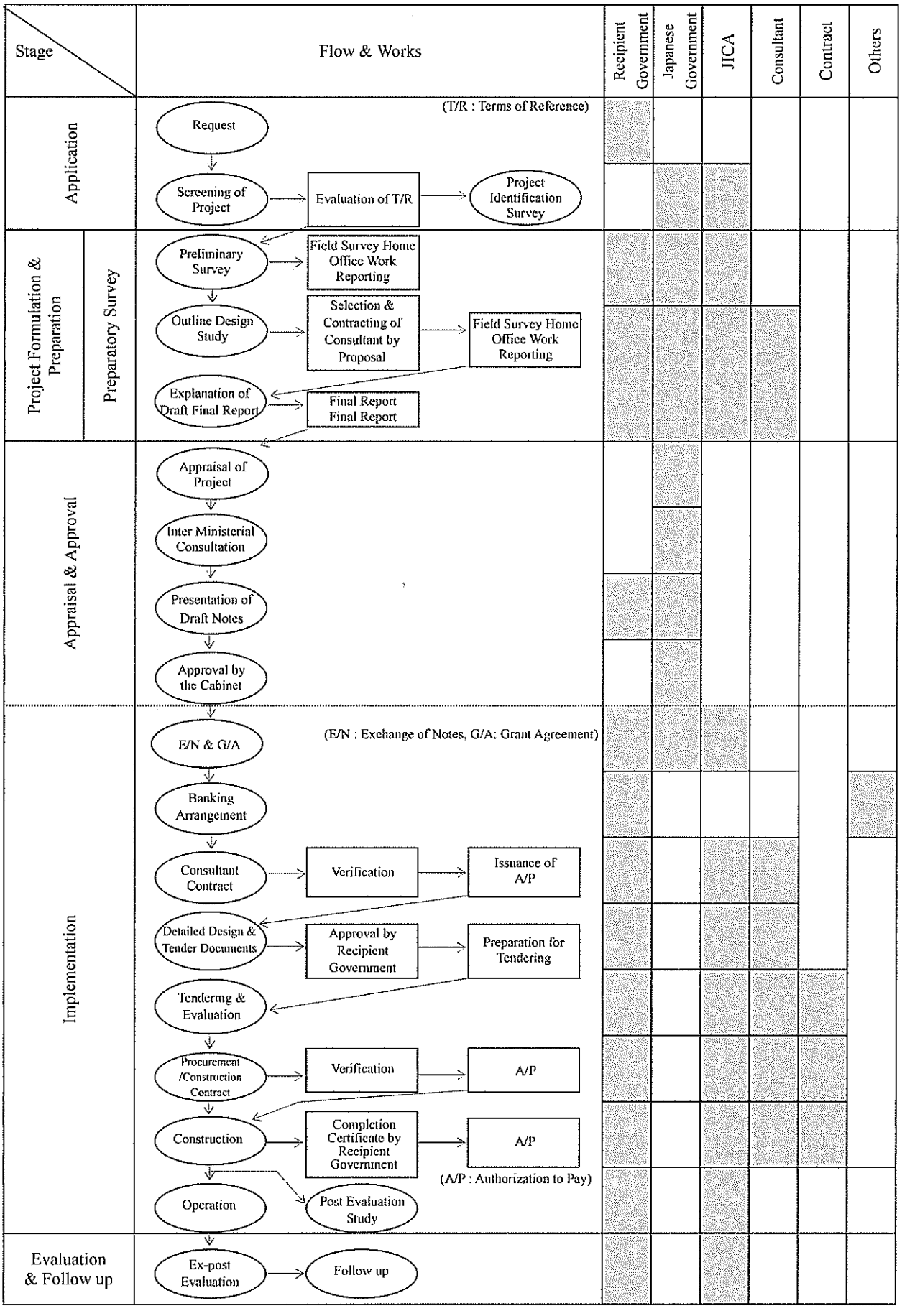
(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA socio-environmental guidelines.

(End)

Attachment 1

FLOW CHART OF JAPAN's GRANT AID PROCEDURES



Attachment-2

Major Understandings to be taken by Each Government

No	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	to secure of land necessary for the implementation of the Project and to clear the site		●
2	To construct the following facilities		
	1) The building	●	
	2) The gates and fences in and around the site		●
	3) The parking lot	●	
	4) The road within the site	●	
	5) The road outside the site		●
3	To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities necessary for the implementation of the Project outside the site		
	1) Electricity		
	a. The distributing power line to the site		●
	b. The drop wiring and internal wiring within the site	●	
	c. The main circuit breaker and transformer	●	
	2) Water Supply		
	a. The city water distribution main to the site		●
	b. The supply system within the site (receiving and elevated tanks)	●	
	3) Drainage		
	a. The city drainage main (for storm sewer and others to the site)		●
	b. The drainage system (for toilet sewer, common waste, storm drainage and others) within the site	●	
	4) Gas Supply		
	a. The city gas main to the site		N/A
	b. The gas supply system within the site	N/A	
	5) Telephone System		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		●
	b. The MDF and the extension after the frame/panel	●	
	6) Furniture and Equipment		
	a. General furniture		●
	b. Project equipment	●	
4	To ensure prompt unloading and customs clearance of the products at ports of disembarkation in the recipient country and to assist internal transportation of the products		
	1) Marine (Air) transportation of the Products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the Products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	●	
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services be exempted		●
6	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
7	To ensure that the Facilities and the products be maintained and used properly and effectively for the implementation of the Project		●
8	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project		●
9	To bear the following commissions paid to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
10	To give due environmental and social consideration in the implementation of the Project.		●

(B/A : Banking Arrangement, A/P : Authorization to pay)

APPENDIX-5

GEOTECHNICAL INVESTIGATION

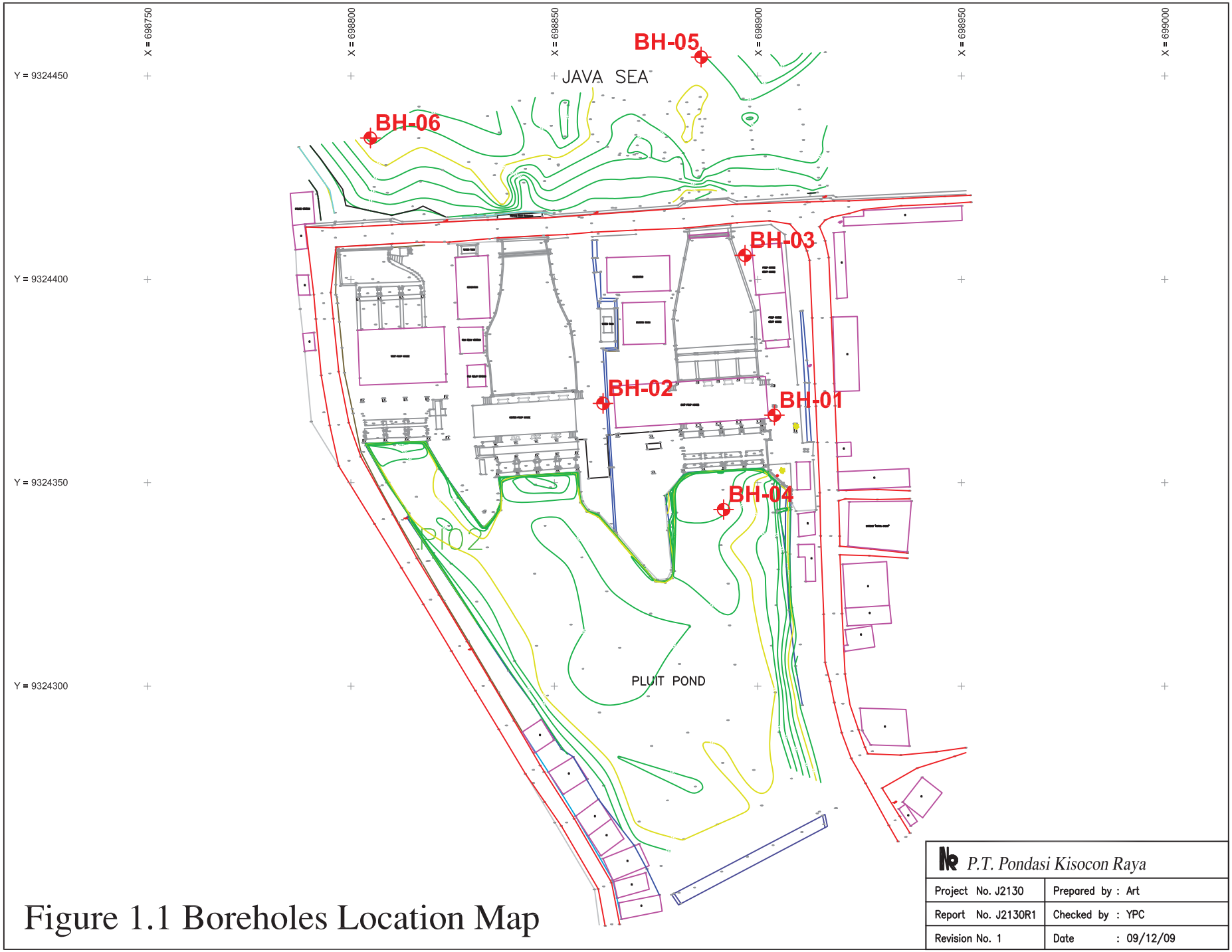


Figure 1.1 Boreholes Location Map

TABLE 2.2(a) SUMMARY OF LABORATORY SOIL TEST

Project : Geotechnical Investigation For Pluit Pump House
Standard: ASTM

Borehole No.		BH-01	BH-01	BH-01	BH-01	BH-01	BH-01	BH-01	BH-01	BH-02
Sample No.		UDS-2	UDS-3	P-13	P-15	UDS-4	P-26	P-40	P-47	UDS-1
Sample Depth (m)	From	8.50	13.50	20.50	23.50	29.00	40.50	60.50	68.50	2.50
	To	9.20	14.00	20.87	23.95	29.50	40.90	60.95	68.95	3.00
Condition of Sample		UD	UD	D	D	UD	D	D	D	UD
Natural water content (ω_n), %		103	75	78	38	82	37	31	28	45
Specific Gravity (G_s)		2.580	2.550	2.740	2.710	2.680	2.640	2.850	2.690	2.680
Wet density (γ_t), kN/m3		14.1	15.1	-	-	15.0	-	-	-	17.2
Dry density (γ_d), kN/m3		6.9	8.6	-	-	8.2	-	-	-	11.9
Natural void ratio (e_o)		2.64	1.89	-	-	2.19	-	-	-	1.21
Degree of saturation (S_r), %		100	100	-	-	100	-	-	-	99
Atterberg Limit	Liquid Limit (LL), %	100	77	-	NP	89	-	NP	44	74
	Plastic Limit (PL), %	35	32	-	NP	34	-	NP	28	31
	Plasticity Index (PI), %	65	45	-	NP	55	-	NP	16	43
Grain Size Distribution	Gravel, %	6	0	0	2	0	0	0	0	4
	Sand, %	12	1	10	72	1	13	58	18	16
	Silt, %	33	75	69	16	81	81	33	59	38
	Clay, %	49	24	21	10	18	6	9	23	42
	Max. diameter, mm	4.75	0.25	2.00	4.75	0.43	2.00	2.00	2.00	12.70
	Diam. at 60%, mm	0.011	0.034	0.027	0.345	0.015	0.026	0.158	0.037	0.017
	Diam. at 10%, mm	-	-	-	0.004	-	0.013	0.007	-	-
Visual soil description		Silty Clay	Clayey Silt	Clayey Silt	Silty Sand	Clayey Silt	Sandy Silt	Silty Sand	Clayey Silt	Silty Clay
ASTM Soil Classification		CH	CH	-	SM	CH	-	SM	ML	CH
Unconfined Compression Test	Undisturbed Strength (q_u) , kN/m2	-	-	-	-	-	-	-	-	-
	Remoulded Strength (q_r), kN/m2	-	-	-	-	-	-	-	-	-
	Sensitivity Ratio	-	-	-	-	-	-	-	-	-
	Strain at failure (ε), %	-	-	-	-	-	-	-	-	-
Triaxial Compression Test	Friction Angle (ϕ), degree	24	19	-	-	18	-	-	-	24
	Cohesion Intercept (c), kPa	34	38	-	-	54	-	-	-	24
	Drainage condition	CU	CU	-	-	UU	-	-	-	CU
Consolidation Test	Preconsolidation Press. (p'_c), kPa	50	196	-	-	461	-	-	-	157
	Compression Index, C_c	1.42	0.92	-	-	2.48	-	-	-	0.42
	Coef. of Consol., c_v, m^2/year	6	6	-	-	5	-	-	-	7
Chemical Test	pH value	-	-	-	-	-	-	-	-	-
	Total sulphate content, %	-	-	-	-	-	-	-	-	-
	Chloride content, %	-	-	-	-	-	-	-	-	-
Remark : NP: Non Plastic										

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TABLE 2.2(b) SUMMARY OF LABORATORY SOIL TEST

Project : Geotechnical Investigation For Pluit Pump House
Standard: ASTM

Borehole No.		BH-02	BH-02	BH-02	BH-02	BH-02	BH-03	BH-03	BH-03	BH-03
Sample No.		UDP-2	P-11	P-16	UDS-2	P-27	UDS-1	P-13	P-15	UDS-3
Sample Depth (m)	From	9.00	20.50	26.00	33.50	42.00	2.50	21.50	24.50	30.50
	To	9.90	20.95	26.45	34.00	42.42	3.00	21.79	24.89	31.00
Condition of Sample		UD	D	D	UD	D	UD	D	D	UD
Natural water content (ω_n), %		93	57	50	46	38	47	46	33	21
Specific Gravity (G_s)		2.490	2.770	2.740	2.710	2.770	2.480	2.690	2.770	2.710
Wet density (γ_t), kN/m3		14.0	-	-	15.9	-	15.9	-	-	17.3
Dry density (γ_d), kN/m3		7.2	-	-	10.9	-	10.8	-	-	14.3
Natural void ratio (e_o)		2.37	-	-	1.44	-	1.25	-	-	0.85
Degree of saturation (S_r), %		98	-	-	87	-	94	-	-	66
Atterberg Limit	Liquid Limit (LL), %	113	22	41	73	-	58	44	NP	53
	Plastic Limit (PL), %	43	17	26	31	-	31	28	NP	30
	Plasticity Index (PI), %	70	5	15	42	-	27	16	NP	23
Grain Size Distribution	Gravel, %	4	0	8	0	2	1	1	1	0
	Sand, %	12	23	21	1	25	36	40	75	1
	Silt, %	34	65	58	63	68	31	48	17	71
	Clay, %	50	12	13	36	5	32	11	7	28
	Max. diameter, mm	9.53	2.00	12.70	0.25	9.53	4.75	4.75	4.75	0.43
	Diam. at 60%, mm	0.008	0.037	0.054	0.028	0.051	0.054	0.083	0.272	0.022
	Diam. at 10%, mm	-	0.003	0.003	-	0.025	-	0.004	0.012	-
Visual soil description		Silty Clay	Sandy Silt	Sandy Silt	Clayey Silt	Sandy Silt	Clayey Sand	Sandy Silt	Silty Sand	Clayey Silt
ASTM Soil Classification		CH	CL	ML	CH	-	MH	ML	SM	MH
Unconfined Compression Test	Undisturbed Strength (q_u) , kN/m2	-	-	-	-	-	-	-	-	-
	Remoulded Strength (q_r), kN/m2	-	-	-	-	-	-	-	-	-
	Sensitivity Ratio	-	-	-	-	-	-	-	-	-
	Strain at failure (ε), %	-	-	-	-	-	-	-	-	-
Triaxial Compression Test	Friction Angle (ϕ), degree	0	-	-	17	-	40	-	-	13
	Cohesion Intercept (c), kPa	17	-	-	29	-	4	-	-	38
	Drainage condition	UU	-	-	UU	-	CU	-	-	UU
Consolidation Test	Preconsolidation Press. (p'_c), kPa	49	-	-	294	-	72	-	-	304
	Compression Index, C_c	1.10	-	-	0.43	-	0.42	-	-	0.29
	Coef. of Consol., c_v, m^2/year	8	-	-	5	-	8	-	-	9
Chemical Test	pH value	-	-	-	-	-	-	-	-	-
	Total sulphate content, %	-	-	-	-	-	-	-	-	-
	Chloride content, %	-	-	-	-	-	-	-	-	-
Remark : NP: Non Plastic										

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TABLE 2.2(c) SUMMARY OF LABORATORY SOIL TEST

Project : Geotechnical Investigation For Pluit Pump House
Standard: ASTM

Borehole No.		BH-03	BH-03	BH-04	BH-04	BH-04	BH-04	BH-04	BH-05	BH-05
Sample No.		P-28	UDS-4	UDP-1	P-10	P-12	UDS-1	P-33	UDP-1	P-11
Sample	From	45.00	47.50	4.00	16.50	19.00	30.50	45.50	6.50	19.00
Depth (m)	To	45.36	48.00	4.90	16.95	19.40	31.00	45.95	7.40	19.39
Condition of Sample		D	UD	UD	D	D	UD	D	UD	D
Natural water content (ω_n), %		22	72	119	37	32	37	36	114	61
Specific Gravity (G_s)		2.660	2.470	2.550	2.770	2.680	2.680	2.580	2.600	2.620
Wet density (γ_t), kN/m3		-	15.0	13.6	-	-	17.8	-	14.0	-
Dry density (γ_d), kN/m3		-	8.7	6.2	-	-	13.0	-	6.5	-
Natural void ratio (e_o)		-	1.78	3.02	-	-	1.02	-	2.89	-
Degree of saturation (S_r), %		-	100	100	-	-	97	-	100	-
Atterberg Limit	Liquid Limit (LL), %	45	84	94	NP	NP	96	NP	88	45
	Plastic Limit (PL), %	32	34	34	NP	NP	36	NP	35	30
	Plasticity Index (PI), %	13	50	60	NP	NP	60	NP	53	15
Grain Size Distribution	Gravel, %	1	0	1	0	0	0	1	0	2
	Sand, %	47	1	5	75	70	1	75	1	15
	Silt, %	38	86	45	16	21	66	12	44	63
	Clay, %	14	13	49	9	9	33	12	55	20
	Max. diameter, mm	4.75	0.43	4.75	4.75	2.00	0.43	4.75	0.25	9.53
	Diam. at 60%, mm	0.556	0.016	0.008	0.280	0.217	0.023	0.339	0.007	0.051
	Diam. at 10%, mm	-	0.003	-	0.005	0.006	-	0.003	-	-
Visual soil description		Silty Sand	Clayey Silt	Silty Clay	Silty Sand	Silty Sand	Clayey Silt	Silty Sand	Silty Clay	Clayey Silt
ASTM Soil Classification		ML	CH	CH	SM	SM	CH	SM	CH	ML
Unconfined Compression Test	Undisturbed Strength (q_u) , kN/m2	-	-	-	-	-	-	-	-	-
	Remoulded Strength (q_r), kN/m2	-	-	-	-	-	-	-	-	-
	Sensitivity Ratio	-	-	-	-	-	-	-	-	-
	Strain at failure (ε), %	-	-	-	-	-	-	-	-	-
Triaxial Compression Test	Friction Angle (ϕ), degree	-	-	25	-	-	0	-	0	-
	Cohesion Intercept (c), kPa	-	-	10	-	-	114	-	17	-
	Drainage condition	-	-	CU	-	-	UU	-	UU	-
Consolidation Test	Preconsolidation Press. (p'_c), kPa	-	500	39	-	-	284	-	39	-
	Compression Index, C_c	-	1.29	1.45	-	-	0.40	-	1.28	-
	Coef. of Consol., c_v, m^2/year	-	10	5	-	-	10	-	6	-
Chemical Test	pH value	-	-	-	-	-	-	-	-	-
	Total sulphate content, %	-	-	-	-	-	-	-	-	-
	Chloride content, %	-	-	-	-	-	-	-	-	-
Remark : NP: Non Plastic										

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TABLE 2.2(d) SUMMARY OF LABORATORY SOIL TEST

Project : Geotechnical Investigation For Pluit Pump House
Standard: ASTM

Borehole No.		BH-05	BH-05	BH-05	BH-06	BH-06	BH-06	BH-06	BH-06	BH-06
Sample No.		P-16	UDS-3	P-23	UDP-1	UDS-1	P-12	UDS-2	P-33	P-38
Sample Depth (m)	From	24.50	30.00	35.50	4.00	13.50	19.00	26.50	44.50	50.00
	To	24.95	30.40	35.95	4.90	14.00	19.35	27.00	44.95	50.45
Condition of Sample		D	UD	D	UD	UD	D	UD	D	D
Natural water content (ω_n), %		31	48	40	92	63	29	69	16	36
Specific Gravity (G_s)		2.720	2.590	2.620	2.630	2.500	2.660	2.690	2.720	2.590
Wet density (γ_t), kN/m3		-	17.3	-	15.0	15.8	-	14.9	-	-
Dry density (γ_d), kN/m3		-	11.7	-	7.8	9.7	-	8.8	-	-
Natural void ratio (e_o)		-	1.17	-	2.30	1.53	-	1.99	-	-
Degree of saturation (S_r), %		-	100	-	100	100	-	93	-	-
Atterberg Limit	Liquid Limit (LL), %	NP	75	47	82	75	NP	105	NP	32
	Plastic Limit (PL), %	NP	30	28	30	30	NP	40	NP	24
	Plasticity Index (PI), %	NP	45	19	52	45	NP	65	NP	8
Grain Size Distribution	Gravel, %	0	0	0	0	0	1	0	1	0
	Sand, %	78	1	17	1	1	79	11	74	3
	Silt, %	10	84	66	40	58	12	70	17	88
	Clay, %	12	15	17	59	41	8	19	8	9
	Max. diameter, mm	2.00	0.43	2.00	0.43	0.25	4.75	2.00	4.75	2.00
	Diam. at 60%, mm	0.357	0.024	0.036	0.005	0.018	0.334	0.018	0.611	0.028
	Diam. at 10%, mm	0.003	-	-	-	-	0.006	-	0.009	0.008
Visual soil description		Silty Sand	Clayey Silt	Clayey Silt	Silty Clay	Clayey Silt	Silty Sand	Clayey Silt	Silty Sand	Clayey Silt
ASTM Soil Classification		SC	CH	ML	CH	CH	SM	CH	SM	ML
Unconfined Compression Test	Undisturbed Strength (q_u) , kN/m2	-	-	-	-	-	-	-	-	-
	Remoulded Strength (q_r), kN/m2	-	-	-	-	-	-	-	-	-
	Sensitivity Ratio	-	-	-	-	-	-	-	-	-
	Strain at failure (ε), %	-	-	-	-	-	-	-	-	-
Triaxial Compression Test	Friction Angle (ϕ), degree	-	16	-	0	19	-	15	-	-
	Cohesion Intercept (c), kPa	-	90	-	14	6	-	37	-	-
	Drainage condition	-	UU	-	UU	UU	-	UU	-	-
Consolidation Test	Preconsolidation Press. (p'_c), kPa	-	540	-	22	167	-	598	-	-
	Compression Index, C_c	-	0.37	-	1.08	0.40	-	1.48	-	-
	Coef. of Consol., c_v, m^2/year	-	9	-	15	16	-	6	-	-
Chemical Test	pH value	-	-	-	-	-	-	-	-	-
	Total sulphate content, %	-	-	-	-	-	-	-	-	-
	Chloride content, %	-	-	-	-	-	-	-	-	-
Remark : NP: Non Plastic										

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Appendix B

Drilling Logs

FIG DRILLING LOG

Project No. J2130 | Project S.I. for Pump House at Pluit, Jakarta | Type of Drilling Rotary Wash Boring

Hole Number BH-01 (PAGE 1 of 3) | Date Oct 27th to Oct 31st, 2009

Water Table GL.-1.2 m. | Elevation -1.086 m. | Driller Akhiri (Hr/Smr)

Remarks
P : Standard Penetration Test
UDS : Open-Drive Undisturbed Sampling
N : 9324366.62 ; E : 698904.09

Scale in m	Elevation in m	Depth in m	Thickness in m	Legend	Type of Soil	Colour	Relative Density or Consistency	General Remarks	Sampling Depth in m.	Sampling Sample No.	Standard Penetration Test N-Value Blows/30cm	Blows Per Each 10 cm 10cm	10cm	10cm	N – Value 10 20 30 40 50
	-1.586	0.50	0.50		Silty Clay	Brown	Very Soft	Fill							
1					Clayey Sand	Gray	Very Loose	Sand is fine to coarse grained. With trace of sea shell.	1.00						
2									1.45	P-1	1/45	1/45'			
3	-3.986	2.90	2.40						2.50						
									2.95	P-2	1/45	1/45'			
4					Silty Clay with Sand	Gray	Very Soft	With decomposed wood. With trace of sea shell.	4.00						
									4.45	P-3	1/45	1/45'			
5									5.00						
									5.40	UDS-1	Recovery = 20 cm				
6									6.25						
									6.45	P-4	1/20	1/20'			
7	-8.086	7.00	4.10						7.50						
					Clay	Greenish Gray	Very Soft	With trace of sea shell fragments.	7.95	P-5	0/45	0/45'			SELF PENETRATION BY HAMMER
8									8.50						
9									9.20	UDS-2	Recovery = 40 cm				
									9.50						
10									9.95	P-6	0/45	0/45'			SELF PENETRATION BY HAMMER
11									11.00						
									11.45	P-7	0/45	0/45'			SELF PENETRATION BY HAMMER
12	-13.086	12.00	5.00												
					Silty Clay	Gray	Soft to Medium Stiff	Molted with red patches.	12.65						
13									12.95	P-8	5	1	2	2	
14									13.50						
									14.10	UDS-3	Recovery = 48 cm				
15									14.75						
	-16.586	15.50	3.50						14.95	P-9	1/20	1/20'			
16					Silty Clay	Light Brown to Light Gray	Medium Stiff to Stiff	Mottled with gray. Weakly to moderately cemented. Silt content increase with depth.	16.15						
17									16.45	P-10	6	2	2	2	
18									17.65						
									17.95	P-11	17	4	6	7	
19									19.15						
									19.45	P-12	14	4	4	6	
20															
	-21.836	20.75	5.25						20.65						
21					Clayey Silt with Sand	Brown	Hard	With trace of fine sand. Moderately to strongly cemented.	20.87	P-13	50/22	6	20	24/2'	50 BLOWS/22cm
22	-23.186	22.10	1.35						22.15	P-14	50/6	50/6'			50 BLOWS/6cm
					Silty Sand	Yellowish Brown	Very Dense to medium Dense	Sand is fine to coarse grained. Moderately to strongly cemented. Cemented sand content increase with depth.	22.21						
23									23.65						
24									23.95	P-15	23	6	7	10	
25						Gray			25.15						
									25.45	P-16	30	10	10	10	
26	-27.086	26.00	3.90												
					Silty Clay	Gray	Stiff to Very Stiff	With sea shell fragment. Shell content decrease with depth.	26.65						
27									26.95	P-17	18	5	6	7	
28									28.15						
									28.45	P-18	10	2	3	5	
29									29.00						
									29.50	UDS-4	Recovery = 39 cm				
30									30.15						
						Grayish Brown			30.45	P-19	8	2	3	3	
31	-32.086	31.00	5.00												

Prepared By : Heri / Soemarso | PT. PONDASI KISOCON RAYA | Checked By : Art | Approved By : YPC

FIG DRILLING LOG

Project No. J2130 | Project S.I. for Pump House at Pluit, Jakarta | Type of Drilling Rotary Wash Boring

Hole Number BH-01 (PAGE 2 of 3) | Date Oct 27th to Oct 31st, 2009

Water Table GL.-1.2 m. | Elevation -1.086 m. | Driller Akhiri (Hr/Smr)

Remarks
P : Standard Penetration Test
UDS : Open-Drive Undisturbed Sampling
N : 9324366.62 ; E : 698861.96

Scale in m	Elevation in m	Depth in m	Thickness in m	Legend	Type of Soil	Colour	Relative Density or Consistency	General Remarks	Sampling Depth in m.	Sample No.	Standard Penetration Test N-Value Blows/30cm	Blows Per Each 10 cm 10cm	10cm	10cm	N – Value 10 20 30 40 50
31	-32.086	31.00	5.00		Silty Clay	Grayish Brown	Stiff to Very Stiff	With sea shell fragment. Shell content decrease with depth.	30.15 30.45	P-19	8	2	3	3	
32					Silty Clay	Gray	Stiff to Very Stiff	With sea shell fragment at GL-36.00 to 37.00m.	31.65 31.95	P-20	14	4	5	5	
33									33.15 33.45	P-21	18	5	6	7	
34															
35									34.65 34.95	P-22	13	4	4	5	
36															
37	-38.086	37.00	6.00						36.15 36.45	P-23	14	4	5	5	
38	-39.586	38.50	1.50		Silty Clay	Gray	Hard	Mottled with Red. Weakly cemented.	37.65 37.95	P-24	36	9	13	14	
39					Silty Sand	Gray to Brownish Gray	Very Dense	Sand is fine grained. Weakly to moderately cemented.	39.15 39.35	P-25	50/20	17	33		50 BLOWS/20cm
40															
41									40.65 40.90	P-26	50/25	12	20	18/5'	50 BLOWS/25cm
42															
43	-44.086	43.00	4.50						42.15 42.33	P-27	50/18	18	32/8'		50 BLOWS/18cm
44					Silty Sand	Brownish Gray	Very Dense	Sand is medium to coarse grained. With a trace of fine gravel at GL- 45.00 to 47.50m. Weakly to moderately cemented. With trace of shell fragments.	43.65 43.74	P-28	50/9	50/9'			50 BLOWS/9cm
45									45.15 45.35	P-29	50/20	20	30		50 BLOWS/20cm
46															
47	-48.586	47.50	4.50						46.65 46.84	P-30	50/19	25	25/9'		50 BLOWS/19cm
48					Silty Clay with Organic	Gray to Dark Gray	Very Stiff	With decomposed wood and organic matters at GL- 48.00 to 48.50m. Weakly cemented at bottom portion.	48.15 48.45	P-31	15	5	5	5	
49									49.00 49.50	UDS-5	Recovery = 0 cm				
50									50.15 50.45	P-32	19	6	6	7	
51	-52.086	51.00	3.50												
52	-53.586	52.50	1.50		Silty Sand	Dark Gray	Medium Dense	Sand is medium to coarse grained. With trace of shell fragment.	51.65 51.95	P-33	17	6	5	6	
53					Silty Clay	Gray	Very Stiff	Weakly cemented.	53.15 53.45	P-34	23	6	7	10	
54	-55.086	54.00	1.50												
55					Silty Clay	Gray	Hard	Moderately cemented. with a few of fine sand at GL-56.0 to -58.0m. With high silt content at bottom portion.	54.65 54.95	P-35	50	16	15	19	50 BLOWS/30cm
56									56.15 56.33	P-36	50/18	23	27/8'		50 BLOWS/18cm
57															
58									57.65 57.80	P-37	50/15	28	22/5'		50 BLOWS/15cm
59	-60.336	59.25	5.25						58.65 58.95	P-38	43	10	13	20	
60					Sand	Gray	Dense to Very Dense	Sand is fine grained. Uniformly graded. With a trace of silt. Weakly cemented.	59.65 59.95	P-39	43	9	10	24	
61	-63.336	62.25	3.00						60.65 60.95	P-40	41	11	13	17	

Prepared By : Heri / Soemarso | PT. PONDASI KISOCON RAYA | Checked By : Art | Approved By : YPC

FIG DRILLING LOG

Project No. J2130
Project S.I. for Pump House at Pluit, Jakarta
Type of Drilling Rotary Wash Boring
Hole Number BH-01 (PAGE 3 of 3)
Date Oct 27th to Oct 31st, 2009
Water Table GL.-1.2 m.
Elevation -1.086 m.
Driller Akhiri (Hr/Smr)

Remarks
P : Standard Penetration Test
UDS : Open-Drive Undisturbed Sampling
N : 9324366.62 ; E : 698904.09

Scale in m	Elevation in m	Depth in m	Thickness in m	Legend	Type of Soil	Colour	Relative Density or Consistency	General Remarks	Sampling: Depth in m.	Sampling: Sample No.	Standard Penetration Test: N-Value Blows/30cm	Blows Per Each 10 cm: 10cm	10cm	10cm
61					Sand	Gray	Dense to Very Dense	Sand is fine grained. Uniformly graded. With a trace of silt. Weakly cemented.	60.65 60.95	P-40	41	11	13	17
62	-63.336	62.25	3.00						61.65 61.81	P-41	50/16	28	22/6'	
63					Silty Clay	Gray	Hard	With a trace of fine gravel (white) at GL- 63.00 to 64.00m. Weakly to moderately cemented.	62.50 62.64	P-42	50/14	50/14'		
64	-65.336	64.25	2.00						63.65 63.95	P-43	39	8	14	17
65					Silty Clay	Brown	Very Stiff	Homogeneous. Mottled with gray. Weakly cemented at GL- 70.00 to 73.00m.	64.65 64.95	P-44	30	8	10	12
66									65.65 65.95	P-45	27	6	10	11
67									67.15 67.45	P-46	18	5	6	7
68									68.65 68.95	P-47	21	6	7	8
69									70.15 70.45	P-48	28	8	9	11
70									71.65 71.95	P-49	28	9	9	10
71									73.15 73.45	P-50	28	9	10	9
72									74.65 74.95	P-51	24	6	8	10
73														
74														
75	-76.036	74.95	10.70		-END OF DRILLING-									
76														
77														
78														
79														
80														
81														
82														
83														
84														
85														
86														
87														
88														
89														
90														
91														

N – Value: 10 20 30 40 50
50 BLOWS/16cm
50 BLOWS/14cm

Prepared By : Heri / Soemarso
PT. PONDASI KISOCON RAYA
Checked By : Art
Approved By : YPC

FIG DRILLING LOG

Project No. J2130 | Project S.I. for Pump House at Pluit, Jakarta | Type of Drilling Rotary Wash Boring

Hole Number BH-02 (PAGE 1 of 2) | Date Nov 1st to 5th '2009

Water Table GL.-1.2 m. | Elevation -0.701 m. | Driller Yani (Smr)

Remarks
P : Standard Penetration Test
UDS : Open-Drive Undisturbed Sampling
UDP : Undisturbed Piston Sampling
UDD : Undisturbed Denison Sampling
N : 9324369.51 ; E : 698861.96

Scale in m	Elevation in m	Depth in m	Thickness in m	Legend	Type of Soil	Colour	Relative Density or Consistency	General Remarks	Sampling: Depth in m.	Sampling: Sample No.	SPT: N-Value Blows/30cm	SPT: Blows Per Each 10 cm: 10cm	10cm	10cm	N – Value
1	-1.401	0.70	0.70		Concrete	Gray	Strong	Concrete of road pump station area.							
2	-2.701	2.00	1.30		Silty Clay	Grayish Brown	Medium Stiff	With a trace of fine sand and organic matters.	1.15 1.45	P-1	5	1	2	2	
3					Silty Clay	Gray	Very Soft	With sea shell fragment at GL- 5.00 to 6.25m and organic matters.	2.50 3.00	UDS-1	Recovery = 30 cm				
4									3.50 3.95	P-2	1/45	1/45'			
5									5.00 5.70	UDP-1	Recovery = 50 cm				
6	-6.951	6.25	4.25												
7	-8.201	7.50	1.25		Clayey Silt	Dark Gray	Soft	With a trace of fine sand and sea shell fragment.	6.65 6.95	P-3	3	1	1	1	
8					Clay with Shell	Gray	Very Soft	With decompossed wood and organic matters. With sea shell fragment at GL- 10.50 to 11.50m.	8.35 8.45	P-4	1/10	1/10'			
9									9.00						
10									9.90	UDP-2	Recovery = 82 cm				
11	-12.201	11.50	4.00						10.50 10.95	P-5	0/45	0/45'			SELF PENETRATION BY HAMMER
12					Clayey Silt with Shell	Dark Gray	Very Soft to Soft	With a trace of sea shell fragment at upper portion. With decompossed wood and organic matters at GL- 13.50 to 14.00m. With a trace of fine sand at GL- 16.00 to 18.50m.	12.00 12.45	P-6	1/45	1/45'			
13															
14									13.50 13.95	P-7	1/45	1/45'			
15									15.00 15.45	P-8	0/45	0/45'			SELF PENETRATION BY HAMMER
16									16.00						
17									16.70	UDP-3	Recovery = 60 cm				
18	-19.201	18.50	7.00						17.65 17.95	P-9	3	1	1	1	
19					Clayey Silt	Brown	Stiff to Very Stiff	With a trace of fine sand at GL- 18.50 to 19.50m. Weakly cemented at GL-20.50 to 21.50m. With high sand content at bottom portion.	19.15 19.45	P-10	9	2	3	4	
20															
21	-22.201	21.50	3.00						20.65 20.95	P-11	28	7	9	12	
22					Sandy Silt	Brown to Gray	Hard	Sand is fine to medium grained. Weakly to moderately cemented. With high sand content at bottom portion.	22.15 22.39	P-12	50/24	16	21	13/4'	50 BLOWS/24cm
23									23.15 23.34	P-13	50/19	22	28/9'		50 BLOWS/19cm
24									24.15 24.32	P-14	50/17	21	29/7'		50 BLOWS/17cm
25									25.15 25.20	P-15	50/5	50/5'			50 BLOWS/5cm
26									26.15 26.45	P-16	32	5	11	16	
27	-27.451	26.75	5.25												
28					Silty Clay	Gray	Stiff to Very Stiff	With sea shell fragment at GL- 28.00 to 28.50m. Spotted with brown at GL- 29.50 to 30.00m. Weakly cemented at GL- 30.00 to 31.50m and GL- 36.00m.	27.15 27.45	P-17	17	5	5	7	
29									28.00 28.30	UDD-1	Recovery = 20 cm				
30									29.65 29.95	P-18	18	5	6	7	
31	-38.201	37.50	10.75												

Prepared By : Soemarso | PT. PONDASI KISOCON RAYA | Checked By : Art | Approved By : YPC

FIG DRILLING LOG

Project No. J2130 | Project S.I. for Pump House at Pluit, Jakarta | Type of Drilling Rotary Wash Boring

Hole Number BH-02 (PAGE 2 of 2) | Date Nov 1st to 5th '2009

Water Table GL.-1.2 m. | Elevation -0.701 m. | Driller Yani (Smr)

Remarks
P : Standard Penetration Test
UDS : Open-Drive Undisturbed Sampling
UDP : Undisturbed Piston Sampling
UDD : Undisturbed Denison Sampling
N : 9324369.51 ; E : 698861.96

Scale in m	Elevation in m	Depth in m	Thickness in m	Legend	Type of Soil	Colour	Relative Density or Consistency	General Remarks	Sampling: Depth in m.	Sampling: Sample No.	Standard Penetration Test: N-Value Blows/30cm	Blows Per Each 10 cm: 10cm	10cm	10cm	N – Value
31					Silty Clay	Gray	Stiff to Very Stiff	With sea shell fragment at GL-28.00 to 28.50m. Spotted with brown at GL- 29.50 to 30.00m. Weakly cemented at GL- 30.00 to 31.50m and GL- 36.00m.	31.15	P-19	22	7	7	8	
32									31.45						
33									32.65	P-20	14	4	5	5	
34									32.95						
									33.50						
									34.00	UDS-2	Recovery = 40 cm				
35									35.15	P-21	16	4	5	7	
36									35.45						
37									36.65	P-22	19	5	6	8	
	-38.201	37.50	10.75						36.95						
38					Silty Sand	Dark Gray	Very Dense	Sand is medium to coarse grained. With fine gravel at bottom portion. High silt content at GL- 39.00 to 41.50m.	38.15	P-23	50/19	24	26/9'		50 BLOWS/19cm
39									38.34						
									39.15	P-24	60/29	15	19	26/9'	60 BLOWS/29cm
40									39.44						
									40.15	P-25	50/18	21	29/8'		50 BLOWS/18cm
41									40.33						
									41.15	P-26	50/25	13	20	17/5'	50 BLOWS/25cm
42									41.40						
									42.15	P-27	60/27	12	32	16/7'	60 BLOWS/27cm
43									42.42						
									43.15	P-28	50/22	17	23	10/2'	50 BLOWS/22cm
44									43.37						
									44.15	P-29	50/17	26	24/7'		50 BLOWS/17cm
45									44.32						
									45.15	P-30	50/13	33	17/3'		50 BLOWS/13cm
46	-46.701	46.00	8.50						45.28						
					Silty Clay	Brown	Medium Stiff to Very Stiff	Mottled with gray patches at upper portion. With a few of black organic matters arround GL- 47.50m.	46.15	P-31	23	6	7	10	
47									46.45						
									47.65	P-32	17	5	5	7	
48									47.95						
49									49.00						
									49.50	UDS-3	Recovery = 42 cm				
50									50.15	P-33	30	8	10	12	
	-51.151	50.45	4.45						50.45						
51					-END OF DRILLING-										
52															
53															
54															
55															
56															
57															
58															
59															
60															
61															

N – Value: 10 20 30 40 50

50 BLOWS/19cm | 60 BLOWS/29cm | 50 BLOWS/18cm | 50 BLOWS/25cm | 60 BLOWS/27cm | 50 BLOWS/22cm | 50 BLOWS/17cm | 50 BLOWS/13cm

Prepared By : Soemarso | PT. PONDASI KISOCON RAYA | Checked By : Art | Approved By : YPC

FIG DRILLING LOG

Project No. J2130
Project S.I. for Pump House at Pluit, Jakarta
Type of Drilling Rotary Wash Boring
Hole Number BH-03 (PAGE 1 of 2)
Date Oct 27th to Oct 31st, 2009
Water Table GL.-2.4 m.
Elevation -0.644 m.
Driller Yani (smr)

Remarks
P : Standard Penetration Test
UDS : Open-Drive Undisturbed Sampling
N : 9324405.90 ; E : 698896.85

Scale in m	Elevation in m	Depth in m	Thickness in m	Legend	Type of Soil	Colour	Relative Density or Consistency	General Remarks	Sampling Depth in m.	Sampling Sample No.	Standard Penetration Test N-Value Blows/30cm	Blows Per Each 10 cm 10cm	10cm	10cm	N – Value 10 20 30 40 50
1					Clayey Silt	Brown	Very Soft	With a trace of fine sand at top portion to depth of 4.00m. Occasionally with medium grained gravel.	1.00						
									1.45	P-1	1/45	1/45'			
2									2.50						
3						Gray			3.10	UDS-1	Recovery = 55 cm				
4									3.75	P-2	1/20	1/20'			
									3.95						
5									5.00						
									5.45	P-3	1/45	1/45'			
6									6.50						
7									6.95	P-4	0/45	0/45'			SELF PENETRATION BY HAMMER
	-8.144	7.50	7.50												
8					Silty Clay	Gray	Very Soft	With a few of decomposed wood and organic matters.	8.00						
									8.45	P-5	1/45	1/45'			
9									9.50						
10									9.95	P-6	0/45	0/45'			SELF PENETRATION BY HAMMER
	-11.144	10.50	3.00												
11					Clay	Light Gray	Very Soft	Homogenous. With a trace of sea shell fragment.	11.00						
									11.45	P-7	0/45	0/45'			SELF PENETRATION BY HAMMER
12	-12.644	12.00	1.50												
					Silty Clay	Gray	Soft	Mottled with brown.	12.65						
13									12.95	P-8	4	1	1	2	
14									14.00						
									14.50	UDS-2	Recovery = 45 cm				
15	-15.394	14.75	2.75												
					Clayey Silt	Grayish Brown	Soft	With a trace of fine sand.	15.75						
16									15.95	P-9	2/20	1	1		
	-17.144	16.50	1.75												
17					Clayey Silt	Grayish Brown	Medium Stiff	With a trace of fine sand.	17.15						
									17.45	P-10	8	2	3	3	
18	-18.644	18.00	1.50												
					Silty Sand	Dark Brown	Loose	Sand is medium to coarse grained. With a trace of sea shell fragment.	18.65						
19									18.95	P-11	9	2	3	4	
	-20.144	19.50	1.50												
20					Silty Sand	Dark Brown	Very Dense	Sand is medium to coarse grained. With a trace of fine gravel. Moderately to strongly cemented.	20.00						
									20.13	P-12	50/13	50/13'			50 BLOWS/13cm
21															
22									21.65						
									21.79	P-13	50/14	32	18/4'		50 BLOWS/14cm
	-23.144	22.50	3.00												
23					Sand	Dark Brown	Very Dense to Dense	Sand is fine to medium grained. Weakly to moderately cemented.	23.15						
									23.32	P-14	50/17	24	26/7'		50 BLOWS/17cm
24															
25									24.65						
									24.89	P-15	50/24	15	21	14/4'	50 BLOWS/24cm
26															
									26.15						
									26.45	P-16	32	8	11	13	
27	-27.644	27.00	4.50												
28					Silty Clay	Gray	Very Stiff	Mottled with red. With a trace of sea shell fragment. Homogenous. Weakly cemented.	27.65						
									27.95	P-17	18	5	6	7	
29															
									29.15						
30									29.45	P-18	16	4	5	7	
									30.50						
31	-39.094	38.45	11.45						31.00	UDS-3	Recovery = 42 cm				

Prepared By : Soemarso
PT. PONDASI KISOCON RAYA
Checked By : Art
Approved By : YPC

FIG DRILLING LOG

Project No. J2130 | Project S.I. for Pump House at Pluit, Jakarta | Type of Drilling Rotary Wash Boring

Hole Number BH-03 (PAGE 2 of 2) | Date Oct 27th to Oct 31st, 2009

Water Table GL.-2.4 m. | Elevation -0.644 m. | Driller Yani (smr)

Remarks
P : Standard Penetration Test
UDS : Open-Drive Undisturbed Sampling
N : 9324405.90 ; E : 698896.85

Scale in m	Elevation in m	Depth in m	Thickness in m	Legend	Type of Soil	Colour	Relative Density or Consistency	General Remarks	Sampling: Depth in m.	Sampling: Sample No.	Standard Penetration Test: N-Value Blows/30cm	Blows Per Each 10 cm: 10cm	10cm	10cm	N – Value
31					Silty Clay	Gray	Very Stiff	Mottled with red. With a trace of sea shell fragment. Homogenous. Weakly cemented.	30.50						
									31.00	UDS-3	Recovery = 42 cm				
32									31.65						
									31.95	P-19	19	5	6	8	
33									33.15						
									33.45	P-20	23	6	8	9	
34									34.65						
									34.95	P-21	20	5	7	8	
35									36.15						
									36.45	P-22	19	6	5	8	
36									37.65						
									37.95	P-23	22	7	7	8	
37	-39.094	38.45	11.45												
38					Silty Sand	Gray	Very Dense	Sand is fine grained. Uniform graded.	39.15						
									39.39	P-24	50/24	16	21	13/4'	50 BLOWS/24cm
39	-40.644	40.00	1.55												
40					Silty Clay	Gray	Hard	Mottled with brown. Weakly cemented.	40.65						
									40.95	P-25	43	11	14	18	
41	-42.144	41.50	1.50												
42					Silty Sand	Gray	Very Dense	Sand is medium to coarse grained. With a trace of fine gravel at GL- 45.00 to 46.00m. Weakly to moderately cemented.	42.15						
									42.42	P-26	50/27	12	14	24/7'	50 BLOWS/27cm
43									43.50						
									43.62	P-27	50/12	50/12			50 BLOWS/12cm
44															
45									45.15						
									45.36	P-28	50/21	21	22	7/1'	50 BLOWS/21cm
46	-46.644	46.00	4.50												
47					Silty Clay	Gray	Stiff to Very Stiff	Homogenous. Weakly cemented.	46.65						
									46.95	P-29	14	5	4	5	
48									47.50						
									48.00	UDS-4	Recovery = 42 cm				
49									48.65						
									48.95	P-30	18	5	6	7	
50	-51.094	50.45	4.45						50.15						
									50.45	P-31	23	6	8	9	
51					-END OF DRILLING-										
52															
53															
54															
55															
56															
57															
58															
59															
60															
61															

Prepared By : Soemarso | PT. PONDASI KISOCON RAYA | Checked By : Art | Approved By : YPC

FIG DRILLING LOG

Project No. J2130 | Project S.I. for Pump House at Pluit, Jakarta | Type of Drilling Rotary Wash Boring

Hole Number BH-04 (PAGE 1 of 2) | Date Nov 3rd to 10th '2009

Water Table GL.+2.58 m. | Elevation -6.184 m. | Driller Akhiri (Smr)

Remarks
P : Standard Penetration Test
UDS : Open-Drive Undisturbed Sampling
UDP : Undisturbed Piston Sampling
N : 9324343.41 ; E : 698891.59

Scale in m	Elevation in m	Depth in m	Thickness in m	Legend	Type of Soil	Colour	Relative Density or Consistency	General Remarks	Sampling: Depth in m.	Sampling: Sample No.	SPT: N-Value Blows/30cm	SPT: Blows Per Each 10 cm: 10cm	10cm	10cm	N – Value
					Concrete	Gray	Strong								
	-6.384	0.20	0.20					Concrete Slab, base of pump station.							
1					Silty Clay	Brown to Brownish Gray	Very Soft	With a lot of sea shell fragment at GL- 4.00 to 6.50m. With high silt content at GL-6.00m.							
2									1.50 / 1.95	P-1	0/45	0/45'			SELF PENETRATION BY HAMMER
3									3.00 / 3.45	P-2	0/45	0/45'			SELF PENETRATION BY HAMMER
4									4.00 / 4.90	UDP-1	Recovery = 74 cm				
5									6.00 / 6.45	P-3	0/45	0/45'			SELF PENETRATION BY HAMMER
6									7.75 / 7.95	P-4	1/20	1/20'			
7									9.00 / 9.45	P-5	0/45	0/45'			SELF PENETRATION BY HAMMER
8									10.00 / 10.70	UDP-2	Recovery = 45 cm				
9	-15.184	9.00	8.80												
10					Clayey Silt	Grayish Brown	Very Soft	With a few of fine sand grained.							
11	-17.684	11.50	2.50												
12					Silty Clay	Brownish Gray	Stiff	Homogenous.	11.65 / 11.95	P-6	9	3	3	3	
13	-19.184	13.00	1.50												
14					Silty Sand	Brown	Very Stiff to Hard	With high silt content at top portion. Weakly to moderately cemented. Sand is fine to medium grained.	13.15 / 13.45	P-7	22	5	10	7	
15									14.65 / 14.90	P-8	50/25	8	11	31/5'	50 BLOWS/25cm
16									15.65 / 15.88	P-9	50/23	7	16	27/3'	50 BLOWS/23cm
	-22.684	16.50	3.50												
17					Silty Sand	Brown	Medium Dense	Sand is fine to medium grained.	16.65 / 16.95	P-10	24	7	7	10	
18	-24.184	18.00	1.50												
19					Silty Sand	Brown	Very Dense	Sand is fine grained.	18.15 / 18.29	P-11	50/14	30	20/4'		50 BLOWS/14cm
20									19.15 / 19.40	P-12	50/25	14	18	18/5'	50 BLOWS/25cm
21						Dark Gray			20.15 / 20.43	P-13	50/28	12	17	21/8'	50 BLOWS/28cm
22	-28.184	22.00	4.00						21.15 / 21.45	P-14	50	11	13	26	50 BLOWS/30cm
23					Silty Clay	Dark Gray	Stiff to Very Stiff	With a few of black organic matters at GL-25.00m. Mottled with yellowish brown patches at GL- 26.50 to 33.50m. With trace of fine sand at bottom portion.	22.15 / 22.45	P-15	18	6	6	6	
24									23.65 / 23.95	P-16	10	3	3	4	
25									25.15 / 25.45	P-17	10	2	3	5	
26									26.65 / 26.95	P-18	28	8	9	11	
27						Light Gray									
28									28.15 / 28.45	P-19	19	5	6	8	
29									29.15 / 29.45	P-20	14	3	5	6	
30									30.50 / 31.00	UDS-1	Recovery = 36 cm				
31	-39.684	33.50	11.50												

Prepared By : Soemarso | PT. PONDASI KISOCON RAYA | Checked By : Art | Approved By : YPC

FIG DRILLING LOG

Project No. J2130
Project S.I. for Pump House at Pluit, Jakarta
Type of Drilling Rotary Wash Boring
Hole Number BH-04 (PAGE 2 of 2)
Date Nov 3rd to 10th '2009
Water Table GL+2.58 m. Elevation -6.184 m. Driller Akhiri (Smr)

Remarks
P : Standard Penetration Test
UDS : Open-Drive Undisturbed Sampling
UDP : Undisturbed Piston Sampling
N : 9324343.41 ; E : 698891.59

Scale in m	Elevation in m	Depth in m	Thickness in m	Legend	Type of Soil	Colour	Relative Density or Consistency	General Remarks	Sampling Depth in m.	Sampling Sample No.	Standard Penetration Test N-Value Blows/30cm	Blows Per Each 10 cm 10cm	10cm	10cm	N – Value 10 20 30 40 50
31					Silty Clay	Dark Gray	Stiff to Very Stiff	With a few of black organic matters at GL-25.00m. Mottled with yellowish brown patches at GL- 26.50 to 33.50m. With trace of fine sand at bottom portion.	31.65 31.95	P-21	13	4	4	5	
32															
33	-39.684	33.50	11.50						33.15 33.45	P-22	18	5	6	7	
34					Silty Sand	Dark Gray	Very Dense	Sand is medium to coarse grained. Silt content decreses with depth. With a few of fine gravel size at GL- 39.50 to 42.00m.	34.15 34.39	P-23	50/24	15	23	12/4'	50 BLOWS/24cm
35									35.15 35.42	P-24	50/27	15	19	16/7'	50 BLOWS/27cm
36															
37									36.65 36.92	P-25	50/27	11	17	22/7'	50 BLOWS/27cm
38									37.65 37.93	P-26	50/28	13	17	20/8'	50 BLOWS/28cm
39									38.65 38.83	P-27	50/18	25	25/8'		50 BLOWS/18cm
40									39.65 39.79	P-28	50/14	30	20/4'		50 BLOWS/14cm
41									40.65 40.77	P-29	50/12	32	18/2'		50 BLOWS/12cm
42	-48.184	42.00	8.50						41.65 41.75	P-30	50/10	50			50 BLOWS/10cm
43					Silty Clay	Gray	Very Stiff	Weakly cemented.	42.65 42.95	P-31	21	10	5	6	
44															
45	-51.184	45.00	3.00						44.15 44.45	P-32	29	10	9	10	
46					Sand	Dark Gray	Medium Dense to Very Dense	Sand is fine to medium grained. With a trace of silt at GL-48.00 to 48.75m.	45.65 45.95	P-33	29	9	10	10	
47															
48									47.15 47.43	P-34	50/28	16	18	16/8'	50 BLOWS/28cm
49	-54.934	48.75	3.75						48.15 48.45	P-35	45	14	14	17	
50					Silty Clay	Gray	Hard	Weakly to moderately cemented.	49.15 49.35	P-36	50/20	18	32		50 BLOWS/20cm
	-56.554	50.37	1.62						50.15 50.37	P-37	50/22	17	22	11/2'	50 BLOWS/22cm
51					-END OF DRILLING-										
52															
53															
54															
55															
56															
57															
58															
59															
60															
61															

Prepared By : Soemarso
PT. PONDASI KISOCON RAYA
Checked By : Art
Approved By : YPC

FIG DRILLING LOG

Project No. J2130 | Project S.I. for Pump House at Pluit, Jakarta | Type of Drilling Rotary Wash Boring

Hole Number BH-05 (PAGE 1 of 2) | Date Nov 8th to 16th '2009

Water Table GL+3.05 m. | Elevation -2.069 m. | Driller Yani (Smr)

Remarks
P : Standard Penetration Test
UDS : Open-Drive Undisturbed Sampling
UDP : Undisturbed Piston Sampling
N : 9324454.63 ; E : 698886.08

Scale in m	Elevation in m	Depth in m	Thickness in m	Legend	Type of Soil	Colour	Relative Density or Consistency	General Remarks	Sampling: Depth in m.	Sampling: Sample No.	SPT: N-Value Blows/30cm	SPT: Blows Per Each 10 cm: 10cm	10cm	10cm
1					Clayey Silt	Gray	Medium Stiff to Soft	With a trace of find sand and organic matters. With a trace of sea shell fragment at GL- around 3.00 to 4.00m.	1.65	P-1	6	2	2	2
2									1.95					
3									3.00					
4	-6.096	4.00	4.00						3.60	UDS-1	Recovery = 55 cm			
5	-7.069	5.00	1.00		Sandy Silt	Gray	Very Soft	Sand is fine grained and organic matters.	4.15	P-2	2	1	1/20'	
6					Clay	Gray	Very Soft	Homogenous. With sea shell fragment increases with depth.	4.45					
7									5.50	P-3	0/45	0/45'		SELF PENETRATION BY HAMMER
8									5.95					
9									6.50					
10									7.40	UDP-1	Recovery = 83 cm			
11	-13.069	11.00	6.00						8.00	P-4	0/45	0/45'		SELF PENETRATION BY HAMMER
12	-14.069	12.00	1.00		Silty Clay	Gray	Very Soft	Mottled with brown.	8.45					
13					Clayey Silt	Reddish Brown	Very Soft	Mottled with gray.	9.50	P-5	0/45	0/45'		SELF PENETRATION BY HAMMER
14	-16.069	14.00	2.00						9.95					
15					Clayey Silt	Brown	Stiff	With a trace of fine sand at GL- 16.00 to 17.00m.	11.15	P-6	2/45	1/35'	1/10'	
16									11.60					
17	-19.069	17.00	3.00						12.00					
18	-20.569	18.50	1.50		Sand	Gray	Dense	Sand is fine grained with a trace of silt. Moderately cemented.	12.60	UDS-2	Recovery = 45 cm			
19					Sand	Brown	Very Dense	Sand is fine grained. Moderately to strongly cemented. With high silt content at top portion and a trace of silt at GL- 20.00 to 21.25m.	13.15	P-7	2/45	1/25'	1/20'	
20									13.60					
21						Gray to Dark Gray			14.65	P-8	10	3	3	4
22									14.95					
23	-25.069	23.00	4.50						16.15	P-9	15	3	5	7
24					Sand	Black	Medium Dense	Sand is fine to medium grained. With a trace of fine gravel size and sea shell fragment at GL- 24.50 to 26.00m.	16.45					
25									17.65	P-10	37	11	12	14
26	-28.069	26.00	3.00						17.95					
27					Silty Clay	Very Stiff	Gray	Mottled with brown. With a trace of sea shell fragment at GL- around 27.50m. Weakly cemented. Homogenous.	19.15	P-11	50/24	11	20	19/4'
28									19.39					
29									20.15	P-12	50/8	50/8'		
30									20.23					
31	-37.069	35.00	9.00						21.15	P-13	50/8	50/8'		
									21.23					
									22.15	P-14	50/28	12	18	20/8'
									22.43					
									23.15	P-15	27	7	9	11
									23.45					
									24.65	P-16	27	8	9	10
									24.95					
									26.15	P-17	28	7	10	11
									26.45					
									27.65	P-18	29	8	9	12
									27.95					
									29.15	P-19	21	6	7	8
									29.45					
									30.00	UDS-3	Recovery = 35 cm			
									30.40					

N - Value: 10 20 30 40 50

50 BLOWS/24cm
50 BLOWS/8cm
50 BLOWS/8cm
50 BLOWS/28cm

Prepared By : Soemarso | PT. PONDASI KISOCON RAYA | Checked By : Art | Approved By : YPC

FIG DRILLING LOG

Project No. J2130 | Project S.I. for Pump House at Pluit, Jakarta | Type of Drilling Rotary Wash Boring

Hole Number BH-05 (PAGE 2 of 2) | Date Nov 8th to 16th '2009

Water Table GL.+3.05 m. | Elevation -2.069 m. | Driller Yani (Smr)

Remarks
P : Standard Penetration Test
UDS : Open-Drive Undisturbed Sampling
UDP : Undisturbed Piston Sampling
N : 9324454.63 ; E : 698886.08

Scale in m	Elevation in m	Depth in m	Thickness in m	Legend	Type of Soil	Colour	Relative Density or Consistency	General Remarks	Sampling Depth in m.	Sampling Sample No.	N-Value Blows/30cm	Blows Per Each 10 cm 10cm	10cm	10cm	N – Value 10 20 30 40 50
31					Silty Clay	Very Stiff	Gray	Mottled with brown. With a trace of sea shell fragment at GL- around 27.50m. Weakly cemented. Homogenous.	31.15 31.45	P-20	21	6	7	8	
32									32.65 32.95	P-21	20	6	6	8	
33									34.15 34.45	P-22	19	5	6	8	
34									35.65 35.95	P-23	29	7	10	12	
35	-37.069	35.00	9.00						37.15 37.33	P-24	50/18	26	24/8'		50 BLOWS/18cm
36					Silty Sand	Gray	Medium Dense	Sand is fine to medium grained.	38.15 38.24	P-25	50/9	50/9'			50 BLOWS/9cm
	-38.569	36.50	1.50						39.15 39.29	P-26	50/14	33	17/4'		50 BLOWS/14cm
37					Sand	Gray to Grayish Black	Very Dense to Dense	Sand is fine to coarse grained. with a lot of silt at GL-38.0m and a trace of silt trough out the layer. Occasionally weakly to moderately cemented. With a trace of fine gravel at bottom portion.	40.15 40.38	P-27	50/23	15	25	10/3'	50 BLOWS/23cm
38									41.15 41.37	P-28	50/22	17	23	10/2'	50 BLOWS/22cm
39									42.15 42.37	P-29	50/22	16	24	10/2'	50 BLOWS/22cm
40									43.15 43.45	P-30	39	13	12	14	
41									44.15 44.37	P-31	50/22	19	23	8/2'	50 BLOWS/22cm
42									45.15 45.33	P-32	50/18	22	28/8'		50 BLOWS/18cm
43	-45.569	43.50	7.00						46.15 46.24	P-33	50/9	50/9'			50 BLOWS/9cm
44					Clayey Silt	Light Gray	Hard	Moderately Cemented.	47.15 47.33	P-34	50/18	21	29/8'		50 BLOWS/18cm
	-46.569	44.50	1.00						48.15 48.45	P-35	42	11	9	22	
45					Silty Sand	Dark Brown to Gray	Very Dense	Sand is fine to medium grained. Weakly to Moderately cemented. With a trace of fine gravel.	49.15 49.45	P-36	29	9	9	11	
46									50.15 50.45	P-37	30	10	9	11	
47															
48	-50.069	48.00	2.50												
49					Silty Clay	Gray	Very Stiff to Hard	Weakly cemented at GL- 48.00 to 48.75m.							
50															
	-52.519	50.45	2.45												
51					-END OF DRILLING-										
52															
53															
54															
55															
56															
57															
58															
59															
60															
61															

Prepared By : Soemarso | PT. PONDASI KISOCON RAYA | Checked By : Art | Approved By : YPC

FIG DRILLING LOG

Project No. J2130 | Project S.I. for Pump House at Pluit, Jakarta | Type of Drilling Rotary Wash Boring

Hole Number BH-06 (PAGE 1 of 2) | Date Nov 14th to 19th '2009

Water Table GL.+2.85 m. | Elevation -3.164 m. | Driller Akhiri (Smr)

Remarks
P : Standard Penetration Test
UDS : Open-Drive Undisturbed Sampling
UDP : Undisturbed Piston Sampling
N : 9324434.74 ; E : 698804.80

Scale in m	Elevation in m	Depth in m	Thickness in m	Legend	Type of Soil	Colour	Relative Density or Consistency	General Remarks	Sampling Depth in m.	Sampling Sample No.	Standard Penetration Test N-Value Blows/30cm	Blows Per Each 10 cm 10cm	10cm	10cm	N – Value 10 20 30 40 50
1					Silty Clay	Gray	Very Soft	With some of organic matters.	1.50						
2									1.95	P-1	0/45	0/45'			SELF PENETRATION BY HAMMER
3									3.00						
4									3.45	P-2	1/45	1/45'			
5									4.00						
6	-9.664	6.50	6.50						4.90	UDP-1	Recovery = 70 cm				
7					Clay	Gray	Very Soft to Soft	High Plasticity. With a few of sea shell fragment arround GL-9.0 to 10.5m	5.50						
8									5.95	P-3	0/45	0/45'			SELF PENETRATION BY HAMMER
9									7.00						
10									7.45	P-4	0/45	0/45'			SELF PENETRATION BY HAMMER
11									8.00						
12	15.164	12.00	5.50						8.90	UDP-2	Recovery = 89 cm				
13					Clayey Silt	Gray	Very soft	Mottled with brown	9.50						
	-16.664	13.50	1.50						9.95	P-5	0/45	0/45'			SELF PENETRATION BY HAMMER
14					Clayey Silt	Gray to Greyish Brown	Medium Stiff to Stiff	Mottled with brown at top portion. Spotted with yellowish brown at bottom portion. Moderately cemented.	11.15						
15									11.45	P-6	4	1	1	2	
16									12.50						
	-19.664	16.50	3.00						12.95	P-7	1/45	1/45'			
17					Silty Sand	Brown Reddish Brown	Very Dense	Sand is medium to coarse grained. With a trace of fine gravel. Moderately cemented.	13.50						
18									14.00	UDS-1	Recovery = 41 cm				
	-21.664	18.50	2.00						14.65						
19					Sand	Brown	Very Dense	Sand is fine grained. With a trace of fine gravel at GL-20.0 to 21.5m. Weakly cemented arround GL-20.0 to 21.0m.	14.95	P-8	15	6	4	5	
20									16.15						
21									16.65	P-9	50/29	5	15	30/9	50 BLOWS/29cm
22									17.00	P-10	50/14	50/14'			50 BLOWS/14cm
23									17.14						
24	-27.164	24.00	5.50						18.15	P-11	50/20	16	34		50 BLOWS/20cm
25					Silty Clay	Gray	Stiff to Very Stiff	Mottled with brown. With a trace of sea shell fragment arround GL-25.5 to 27.0m. Weakly cemented arround GL-27.5 to 30.0m.	18.35						
26									19.15	P-12	50/20	19	31		50 BLOWS/20cm
27									19.35						
28									20.00	P-13	50/10	19	50/10		50 BLOWS/10cm
29									20.16						
30									21.00	P-14	50/9	21	50/9		50 BLOWS/9cm
31	-39.164	36.00	12.00						21.16						
									22.15	P-15	50/18	24	26/8'		50 BLOWS/18cm
									22.33						
									23.15	P-16	50/25	14	22	14/5	50 BLOWS/25cm
									23.49						
									24.15	P-17	19	6	6	7	
									24.45						
									25.65	P-18	14	5	5	4	
									25.95						
									26.50						
									27.10	UDS-2	Recovery = 59 cm				
									27.65						
									27.95	P-19	22	7	7	8	
									29.15						
									29.45	P-20	24	7	8	9	
									30.65						
									30.95	P-21	20	6	6	8	

Prepared By : Soemarso

PT. PONDASI KISOCON RAYA

Checked By : Art

Approved By : YPC

FIG DRILLING LOG

Project No. J2130 | Project S.I. for Pump House at Pluit, Jakarta | Type of Drilling Rotary Wash Boring

Hole Number BH-06 (PAGE 2 of 2) | Date Nov 14th to 19th '2009

Water Table GL.+2.85 m. | Elevation -3.164 m. | Driller Akhiri (Smr)

Remarks
P : Standard Penetration Test
UDS : Open-Drive Undisturbed Sampling
UDP : Undisturbed Piston Sampling
N : 9324434.74 ; E : 698804.80

Scale in m	Elevation in m	Depth in m	Thickness in m	Legend	Type of Soil	Colour	Relative Density or Consistency	General Remarks	Sampling Depth in m.	Sample No.	N-Value Blows/30cm	Blows Per Each 10 cm 10cm	10cm	10cm	N - Value 10 20 30 40 50
31					Silty Clay	Gray	Stiff to Very Stiff	Mottled with brown. With a trace of sea shell fragment arround GL-25.5 to 27.0m. Weakly cemented arround GL-27.5 to 30.0m.	30.65 30.95	P-21	20	6	6	8	
32									32.15 32.45	P-22	18	5	6	7	
33															
34									33.65 33.95	P-23	16	4	5	7	
35															
36	-39.164	36.00	12.00						35.15 35.45	P-24	20	6	7	7	
37					Sandy Silt	Gray	Hard	Sand is fine to medium grained. Moderately to strongly cemented. With a trace of fine gravel.	36.65 36.82	P-25	50/17	20	30/7'		50 BLOWS/17cm
38									37.65 37.70	P-26	50/5	50/5'			50 BLOWS/5cm
39	-42.664	39.50	3.50						38.65 38.90	P-27	50/25	15	19	16/5'	50 BLOWS/25cm
40	-43.664	40.50	1.00		Sand	Gray	Very Dense	Sand is fine grained. With a few of silt.	39.65 39.93	P-28	50/28	14	20	16/8'	50 BLOWS/28cm
41					Silty Sand	Gray to Dark Gray	Very Dense to Dense	Sand is fine to coarse grained. Occasionally with some of fine gravel. Weakly to moderately cemented.	40.65 40.95	P-29	47	10	15	22	
42									41.65 41.77	P-30	50/12	35	15/2'		50 BLOWS/12cm
43									42.50 42.64	P-31	50/14	50/14'			50 BLOWS/14cm
44									43.65 43.81	P-32	50/16	28	22/6'		50 BLOWS/16cm
45									44.65 44.95	P-33	43	14	14	15	
46									45.65 45.80	P-34	50/15	18	32/5'		50 BLOWS/15cm
47	-50.664	47.50	7.00						46.65 46.72	P-35	50/7	50/7'			50 BLOWS/7cm
48					Silty Clay	Gray	Hard to Very Stiff	Weakly cemented at top portion. With a few of white dots bottom portion.	47.65 47.95	P-36	36	11	12	13	
49									48.65 48.95	P-37	26	8	8	10	
50	-53.614	50.45	2.95						50.15 50.45	P-38	27	10	8	9	
51					-END OF DRILLING-										
52															
53															
54															
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57															
58															
59															
60															
61															

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