Preparatory Survey on Water Quality Improvement Project for Japanese Bridge Area, in Hoi An City, Quang Nam Province, Socialist Republic of Vietnam

TECHNICAL MEETING

March 11, 2014

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Nihon Suido Consultants Co., Ltd.

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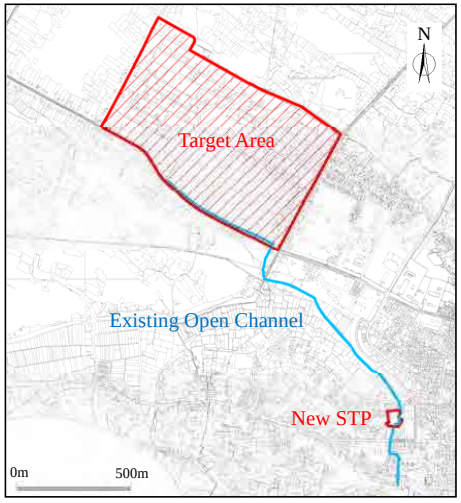
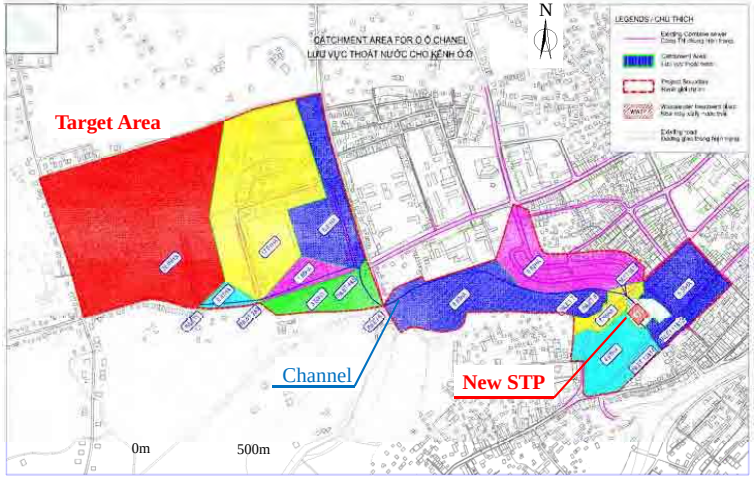
1. Survey Area and Planned Facility



2. Project Frame (catchment area of the channel)



2. Project Frame

Survey area: Catchment Area of Japanese Bridge Channel
(5 Wards of: Tan An, Minh An, Cam Pho, Thanh Ha, Cam Ha)

Target Year: Year 2030

Year	Sewage flow Generated (m³/day)		Connection Ratio		Sewage Flow to be Treated (m³/day)		
	Target Estate	French Project Area	Target Estate	French Project Area	Target Estate	French Project Area	Total
2015	928	1,255	0.10	1.00	93	1,255	1,348
2020	1,157	1,283	0.75	0.85	868	1,091	1,959
2025	1,256	1,317	0.80	0.60	1,005	790	1,795
2030	1,373	1,353	0.90	0.20	1,236	271	1,507

The sewage treatment capacity in this project is recommended as
2,000m³/day

3. Proposed Sewage Treatment Plant (1/15)

Selection of Sewage Treatment Process

- Required Effluent Quality in QCVN 14-2008/BTNMT
- Treated Effluent in Vietnamese Standard TCVN 7222:2002
- Buffer zone in QCVN-07:2010/BXD
- Sewage Volume
  Daily Maximum Flow: 2,000m³/d

3. Proposed Sewage Treatment Plant (2/15)

QCVN 14-2008/BTNMT

No.	Item	Unit	A	B
1.	pH		5 – 9	5 – 9
2.	BOD_5 (20 °C)	mg/l	30	50
3.	Total suspended solids (TSS)	mg/l	50	100
4.	Total dissolved solids (TS)	mg/l	500	1,000
5.	Sulfide (H_2S)	mg/l	1	4
6.	Ammonia nitrogen (NH_4^+-N)	mg/l	5	10
7.	Nitrate nitrogen (NO_3^--N)	mg/l	30	50
8.	Mineral oil, vegetable oil	mg/l	10	20
9.	Total surface-active substances	mg/l	5	10
10.	Phosphate phosphorus (PO_4^{3-}-P)	mg/l	6	10
11.	Total coliforms	MPN/100ml	3,000	5,000

Note:
A: apply for discharging wastewater at the upstream of Water treatment plant
B: apply for discharging wastewater at the downstream of Water treatment plant

3. Proposed Sewage Treatment Plant (3/15)

TCVN 7222:2002

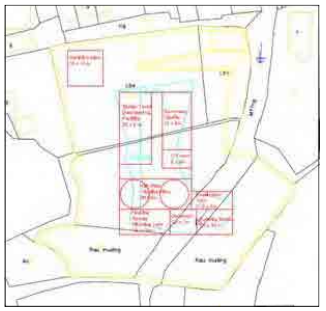
Parameter	Preliminarily treated sewage – Level 1	Treated sewage – Level 2	Treated sewage – Level3
(1)	(2)	(3)	(4)
pH	6 to 9	6 to 9	6 to 9
BOD (mg/l)	100 to 200	10 to 30	5 to below 10
Total SS (mg/l)	100 to 150	10 to 30	5 to below 10
Total N (mg/l)	20 to 40	15 to 30	3 to 5
Total phosphor (mg/l)	7 to 15	5 to 12	1 to 2
Note: Quality level of the Treated Sewage- Level 3 in the column 4 is the result of advance, complex treatment process. Encourage investment and apply this technology.			

3. Proposed Sewage Treatment Plant (4/15)

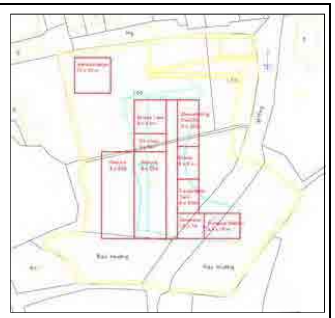
QCVN-07:2010/BXD

No.	Items	Buffer zone (m) base on capacity (×1000m³/day)			
		< 0.2	**0.2 – 5**	5 – 50	>50
1.	Pumping Station	15	20	25	30
2.	Sewage treatment plant				
a.	Physical treatment (combine with Sludge drying bed)	100	200	300	400
b.	Biological treatment (combine with Sludge drying bed)	100	150	300	400
c.	**Biological treatment without Sludge drying bed (with Sludge dehydration system, odor treatment, and closed facilities)**	10	15	30	40
d.	Underground Soil Absorption	100	150	300	500
e.	Natural plant treatment	50	200	400	1,000
f.	Lagoon	50	200		
g.	Oxidation Ditch	50	150		

3. Proposed Sewage Treatment Plant (5/15)



Advanced Energy Saving Wastewater Treatment Process



Sequence Batch Reactor Process (SBR)

3. Proposed Sewage Treatment Plant (6/15)

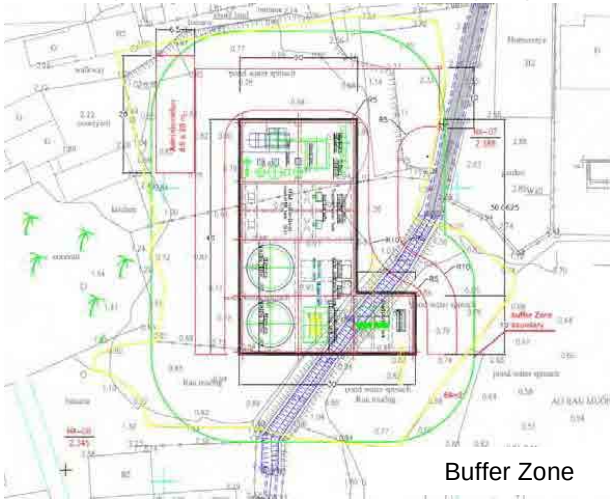
	Advanced Low Energy Sewage Treatment	**Sequence Batch Reactor Process (SBR)**
Facility Area (m²)	930 (=20x39.5+12x11.5)	990 (=18x38.5+9x24+11.5x7)
Electricity Consumption (kwh/year)	202,000	577,000
O&M	100%	200%
Capital	100%	110%
Evaluation	○	×
	Since Electricity consumption is lower than SBR process, O&M cost is lower. Also, facility area is relatively small and operation is easier than SBR because only pumping is an operational factor.	O&M cost is high because of high electricity consumption. Also, it is difficult to have the required buffer zone because of large facility area. Therefore, it is not suitable.

3. Proposed Sewage Treatment Plant (7/15)

- Facilities of Sewage Treatment Plant
  Sewage Treatment: Advance Low Energy Treatment
  Sludge Treatment: Dewatering →Composting in
  Hoi An Waste Disposal Site

Facility	**Description**
Pump Room	Screen and four pumps
Primary Sedimentation	2 tanks
Trickling Filter	2 tanks
Secondary Sedimentation	2 tanks
Disinfection	One tank with UV Radiation
Sludge Tank	2 tanks
Dehydration Room	Screw Press Machine
Odor Treatment Room	Activated Carbon Absorption
Garage with Sludge Hopper	Sludge hopper and 4 t truck

3. Proposed Sewage Treatment Plant (8/15)

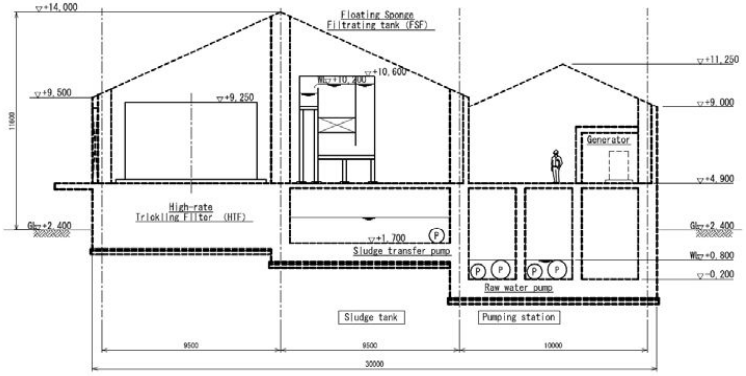


3. Proposed Sewage Treatment Plant (9/15)

Flood Level

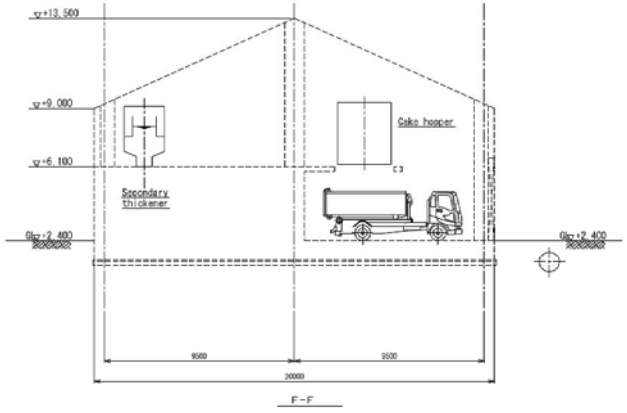
	
Flood Record Plate is displayed on wall in the kindergarten.	Flood Record Plate mentions that the blue line is flood level in year 2009. Based on site survey, flood level is 4.28m.

3. Proposed Sewage Treatment Plant (10/15)

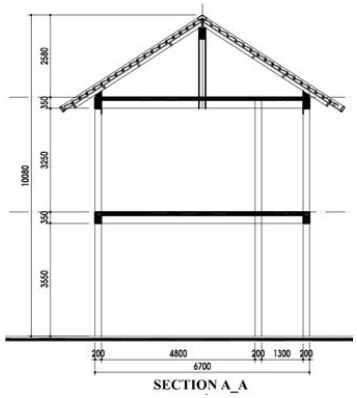


Height of Building from Ground: 11.6 m

3. Proposed Sewage Treatment Plant (11/15)

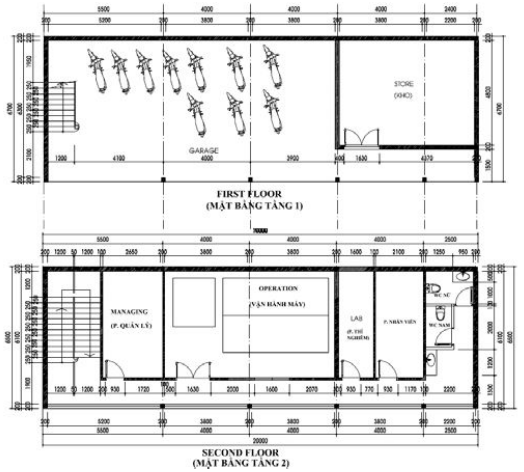


3. Proposed Sewage Treatment Plant (12/15)

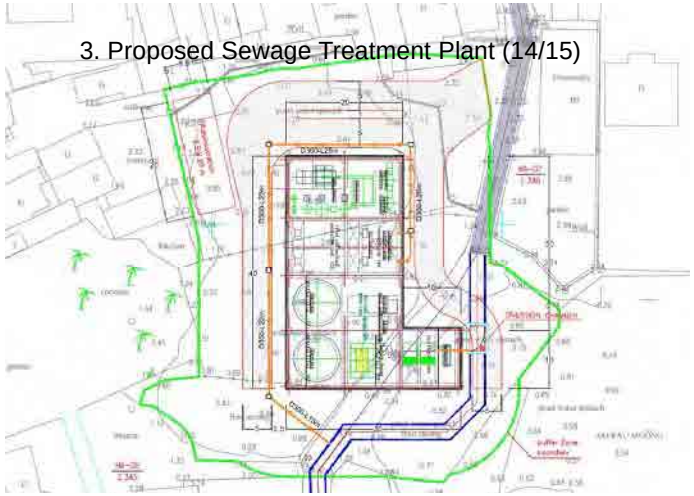


Height of Building from Ground: below 10.5 m

3. Proposed Sewage Treatment Plant (13/15)



3. Proposed Sewage Treatment Plant (14/15)



Green line; Boundary of STP
Trees are planted at the south of STP and along with Boundary of STP

3. Proposed Sewage Treatment Plant (15/15)

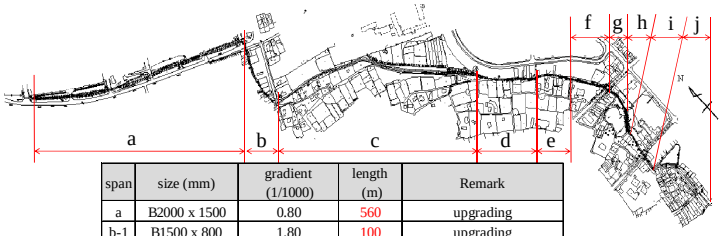
Tentative Perspective Drawing

4. Proposed Upgrading Open Channel (1/5)

Design Concept of Upgrading Open Channel

- The purpose of upgrading channel is mainly the measures for odor.
- Rehabilitation is objected for the length from sewage treatment site to southern part of upstream residential area.
  - Change the existing open channel to Covered channel or Box culvert
  - Solve the problem of water stagnation at depressed inverts and the portions with irregular slope in the canal
- The capacity of channel is almost same as existing channel. (that means no mitigation for flood disaster)
- Keeping aperture on the wall facing to agricultural field to allow flowing in and out occasionally in heavy rain condition.

4. Proposed Upgrading Open Channel (2/5)

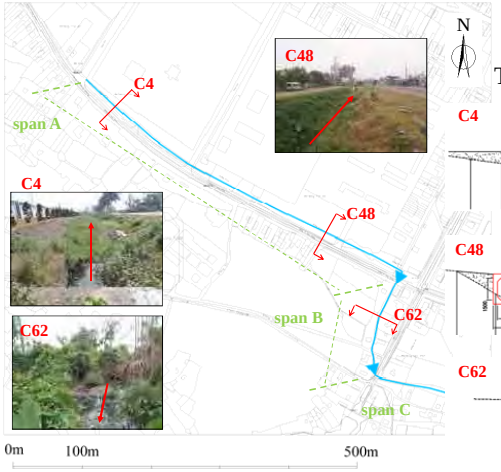


span	size (mm)	gradient (1/1000)	length (m)	Remark
a	B2000 x 1500	0.80	560	upgrading
b-1	B1500 x 800	1.80	100	upgrading
b-2	B1000 x 1000	3.00	50	upgrading
c	B2300 x 900	1.30	510	upgrading
d	K1900 x 1100	1.30	160	upgrading
e	K2300 x 1100	1.30	90	upgrading
f	K3000 x 1000	2.01	80	same as existing channel
g	B2300 x 1700	0.82	70	upgrading
h	B2600 x 1300	1.80	50	upgrading
i	B1700 x 2200	2.30	110	same as existing channel
j	K6000 x 2400	0.88	160	same as existing channel
total	for upgrading		1,590	
	grand total		1,940	

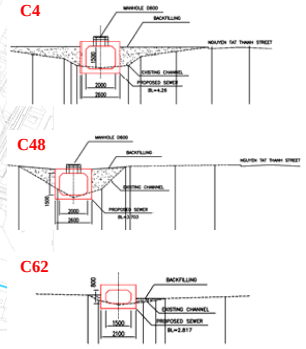
K:Covered Channel（width x height）, B:Box Culvert（width x height）

4. Proposed Upgrading Open Channel (3/5)

Plan View

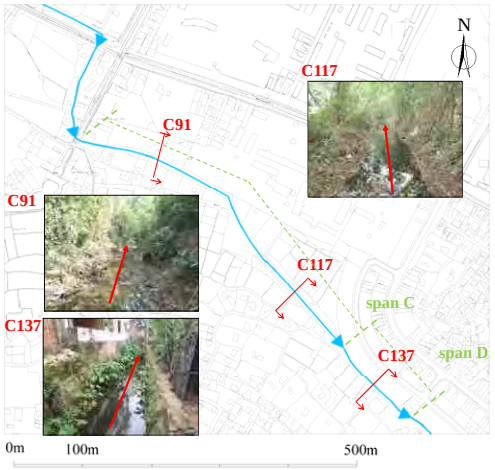


Typical Cross Section

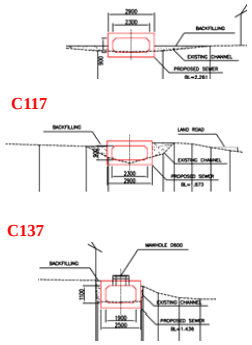


4. Proposed Upgrading Open Channel (4/5)

Plan View

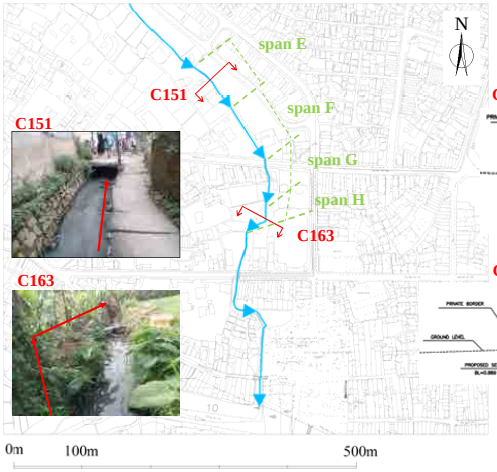


Typical Cross Section

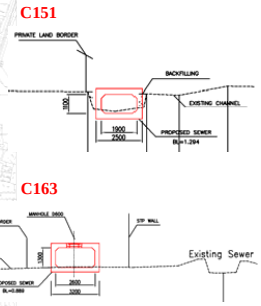


4. Proposed Upgrading Open Channel (5/5)

Plan View



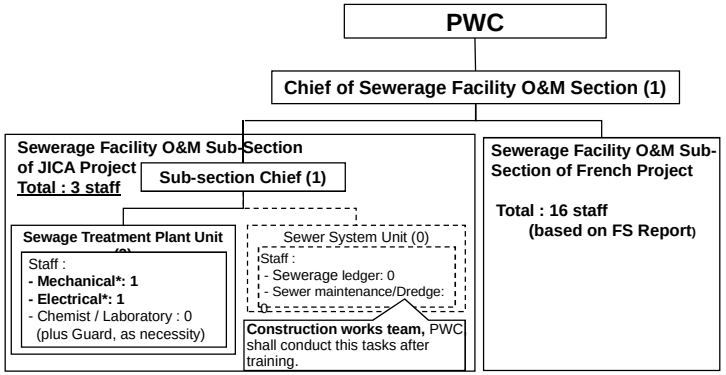
Typical Cross Section



5. Proposed O&M Organization of JICA Project (1/2)

- O&M organization is assumed to be established in PWC.
- Following tasks shall be conducted by existing section of PWC; Legal (regislation establishment & sub-contract) / Human affairs / Accounting / Inventory / Customer service desk / PR / Billing & collection tasks, etc of sewerage O&M organization.
- Chemist / Laboratory task for JICA Project shall be conducted by Chemist / Laboratory staff of French Project by duty-trip bases.
- It is preferable that Sub-section Chief (JICA Project) should have the background of water quality / chemical knowledge to be able to do simple WQ analysis.
- Sub-section Chief (JICA Project) shall be trained to be able to renew and to see the facility information database (drawings, specification, etc.).

5. Proposed O&M Organization of JICA Project (2/2)



Note: *; Mechanical staff and Electrical staff shall be responsible for operation and maintenance of facilities.

6. Proposed Soft Components of the Project (1/2)

General Tasks	Training method
Operation of facilities	Possibility of external training (Contractor shall train the staff for operation method of EACH equipment. Entire system management shall be trained by Soft Component.)
Check, maintenance & repair of facilities including cleaning of channel	Possibility of Soft component. "Maintenance of STP" shall be included in the "O&M of STP (next page)".
Water quality test / analysis	Simple test is undertaken directly, Other parameters shall be outsourced. Training by Vietnamese institution
Recording & management of sewerage facility information (facility ledger)	Possibility of Soft component (included in O&M of STP)
Procurement & control of material / equipment	Possibility of Soft component (included in O&M of STP)
Accounting, financial plan, draft tariff revision plan (accounting & finance)	Accounting: training by local institution, tariff: for a while no need, financial plan: possibility of Soft component (included in Sewerage financial management, next page)
Public Relations (PR) activity, customer relations for such as; stop dumping garbage into channel, Public education	Possibility of Soft component (by Public Relations and Environmental Education, next page)

6. Proposed Soft Components of the Project (2/2)

These are tentative proposals and the final decision requires JICA's approval based on the necessity and priority evaluations.

No.	Title of Soft Component	Contents of Training
1	**Operation & Maintenance of STP & Pump / Treatment process**	Train how to use the water quality data for operation of STP and response to flooding, sludge treatment & disposal methods, procurement of chemical & materials, combination operation of pump & mechanical equipment. Training to make database of facility drawings, specification, procurement related data. Guidance on O&M record preparation (daily report and monthly report, etc.).
2	**Maintenance of Drain / Channel**	Training of planning for inspection & cleaning. Training of cleaning methods for Japanese Bridge Channel, inspection & cleaning patrol plan including the other drains / channels in Hoi An City, staff planning proposal (if necessary). Training of how to clean the sewer/drain/channel. Implementation of Japanese Bridge Channel cleaning campaign with "PR & Environmental Education" activity.
3	**Sewerage financial management**	If the enough budget is not allocated, O&M shall be difficult. So the importance of sewerage O&M budget acquisition shall be confirmed. Since O&M organization is one of the other services in PWC, O&M costs for sewerage will be unclear. So, the training will be provided to prepare income-expense report for only sewerage service. Training for preparation of investment plan for equipment replacement.
4	**Public Relations and Environmental Education**	Channel will soon become dirtier, in case that the citizen's damping garbage into it is not stopped. Training and teaching material preparation of Public Relation Activity and environmental education on school children & citizens, support for planning and implementation for citizen's clean up campaign of Japanese Bridge Channel.

O&M budget of this Project

- O&M budget is necessary for staff salary, electricity, chemical, fuel, repair, replacement, outsourcing, etc.
- Without the sufficient budget source for O&M, constructed facilities shall soon be stopped or left after broken.
- It is indispensable to consider the possible budget source for O&M costs of the Project.
- Now, the financial situation of Hoi An CPC is very good as shown in continuous budget surplus.
- It is proposed that a part of budget of Hoi An CPC is allocated enough for O&M costs for this JICA Project every year, as Contract Amount for sewerage services to PWC.

7. Procurement Plan for Construction Materials (1/3)

Name of Material	Source of Procurement			Remarks
	Japan	Vietnam	Third countries	
1.COnstruction Material				
Ready Mixed Concrete		○		
Sand and Gravel		○		
Cement		○		
Steel Bar		○		
Formwork Wooden Plate		○		
Wood		○		
Steel Sheet Pile and H-Shape Steal Pile		○		
Prestressed Concrete Pile		○		
Galvanized Steel Plate		○		
Paints		○		
Lubricant		○		
Fuel		○		
Water Stops	○			
Filter Sand		○		
Scaffolding and Support		○		

7. Procurement Plan for Construction Materials (2/3)

Name of Material	Source of Procurement			Remarks
	Japan	Vietnam	Third countries	
2.Equipment				
Coarse Screen		○		
Pumps	○			
Steel Tanks		○		
Filter media	○			
Rotating Equipment	○			
High Speed Electric Valves	○			
Sludge Collector	○			
Scum Skimmer	○			
UV Equipment	○			
Blower	○			
Air Compressor	○			
Thickener		○		
Sludge Mixing Equipment	○			
Dehydrator	○			
Cake Conveyer		○		

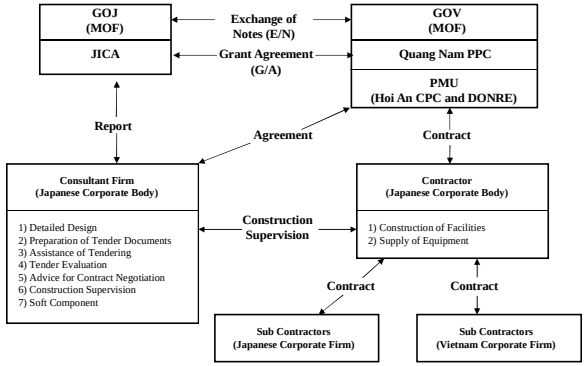
7. Procurement Plan for Construction Materials (3/3)

Name of Material	Source of Procurement			Remarks
	Japan	Vietnam	Third countries	
Cake Container		○		
Chemical Pump	○			
Deodorization Apparatus	○			
Activated Carbon		○		
Chemical Tank	○			
Instrumentation	○			
Generator	○			
Control Panel	○			
Wiring, Piping		○		

8. Results of Stakeholder Meeting

No.	Opinion / Comments	Reply / Countermeasure
1	In operation phase, is there any possibility of odors and noise around STP?	There is little noise and odors around STP in operation phase as a result of closed building and deodorization process.
2	During the construction, noise and dust must be mitigated as much as possible not to affect the children in the kindergarten.	During the construction, watering on road and construction site will be conducted, and the low-emission and low-noise equipment will be installed.
3	In case of malfunction of STP, how will the contingency be solved?	Before and after the STP start running, Japanese experts will train Vietnamese staffs for the operation and maintenance of STP. They will have enough capacity to solve the malfunction of STP.
4	Compensation should be based on negotiation with affected households.	Compensation will be transparent and based on the government regulations for compensation.

9. Structure for Project Implementation



10. Request by GOV and Proposal by JST

	Request from GOV (June 2012)	Proposal from JST (March 2014)
Wastewater Treatment Facilities	- Capacity of 2,000 m^3/day - Sludge treatment facilities - Sequencing Batch Reactor Process	- Capacity of 2,000 m^3/day - Sludge treatment facilities - Advanced Energy Saving Wastewater Treatment Process
Upgrading Open Channel	- About 2 km	- 1.59 km
Operation and Maintenance Equipment	- A convertible truck - Inspection equipment for water quality control (1 set) - A personal computer and a printer for data logging	Necessary operation and maintenance equipment will be considered, if necessary procedure of Vietnam side is completed earlier that the schedule.
Training of the Hoi An members	If necessary	- Soft component proposed.

11. Other Relevant Issues (1/6)

Approval of Social and Environmental Consideration
It is expected the Detailed-EIA report and Compensation, Support and Resettlement Plan (CSRP) would be prepared by the end of March and approved by the end of May, 2014.

Approval of Project Implementation
It is expected the Investment Report for the Project (IRP) would be prepared by the end of March and approved by the end of May, 2014. Any approval for facility constructions shall be also obtained before implementation of the Project

Hoi An CPC and DONRE will execute obtaining these approvals, and JST will monitor the progress.

11. Other Relevant Issues (2/6)

Land Acquisition
CPC and DONRE confirmed Land Acquisition for STP site by the end of June, 2014.

Consensus-building with Residents and Land Owners
CPC and DONRE ensures the Consensus-building of Residents vicinity of new STP site by the end of May, with some evidences such as written informed consent.

Hoi An CPC and DONRE will execute these and JST will monitor the progress.

11. Other Relevant Issues (3/6)

O&M Organization
CPC and DONRE ensures the O&M Organization will be established before implementation of the Project.

Budgetary Source for O&M Cost
CPC and DONRE ensures the Budgetary Source of O&M Cost after implementation of the Project.

11. Other Relevant Issues (4/6)

Securing Lands
In addition to the land acquisition for WTP site, CPC and DONRE will be required securing the following lands during the construction stage.
- Temporary stock yard and site
- Suitable disposal area for the surplus soil
- Temporary approach roads to construction sites

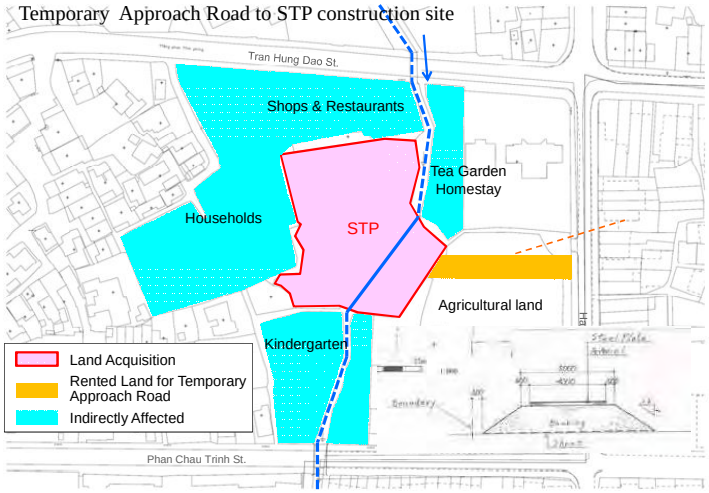
Others
CPC will install the following facility:
- Gate and fence surrounding of the STP site.
- Power line, city water, telephone line to STP site.

Special construction regulation shall be further discussed with JST.

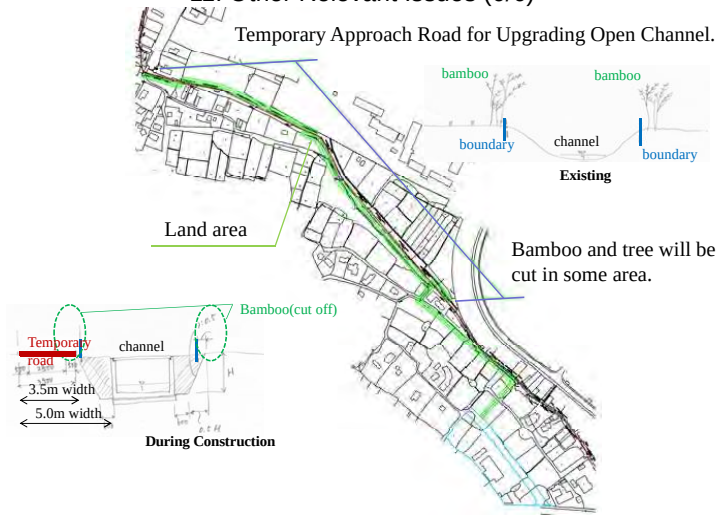
the GOV is required B/A and A/P arrangements, and VAT, custom duties, internal tax, and other fiscal levies shall be exempt or borne by the GOV during Project Implementation.

Necessary costs borne by the GOV will be examined in the Study of JPN.

11. Other Relevant Issues (5/6)



11. Other Relevant Issues (6/6)



12. Further Schedule (1/3)

Description	2013	2014										
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Inception Report	▲											
1st Field Surveys in Vietnam												
2nd Field Surveys in Vietnam												
1st Study in Japan												
3rd Field Survey in Vietnam												
2nd Study in Japan												
Draft Final Report											▲	
Explanation/Discussion DFR												
Final Report												▲
Preparation: D-EIA & CSRP												
Approval: D-EIA & CSRP												
Preparation: IRP (Pre-FS/R)												
Approval: Project Implementation												
Land Acquisition												
Consensus w Residents				▲SH								

12. Further Schedule (2/3)

Description	2014	2015										
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Cabinet Meeting in GOJ	▲											
Exchange of Notes (E/N)		▲										
Consulting Service Agreement			▲									
Detailed Design in Vietnam												
Detailed Design in Japan												
Preparation of Tender Doc.												
Approval of Tender Doc												
Pre-Qualification (P/Q)												
Deliver of Tender Doc.									△			
Tendering & Evaluation										△		
Contract for Construction											△	
Preparation of Construction												
PMU Establishment		▲										
O&M Organization Establishment												▲
Gate, Fence, power, water, teleph												

12. Further Schedule (3/3)