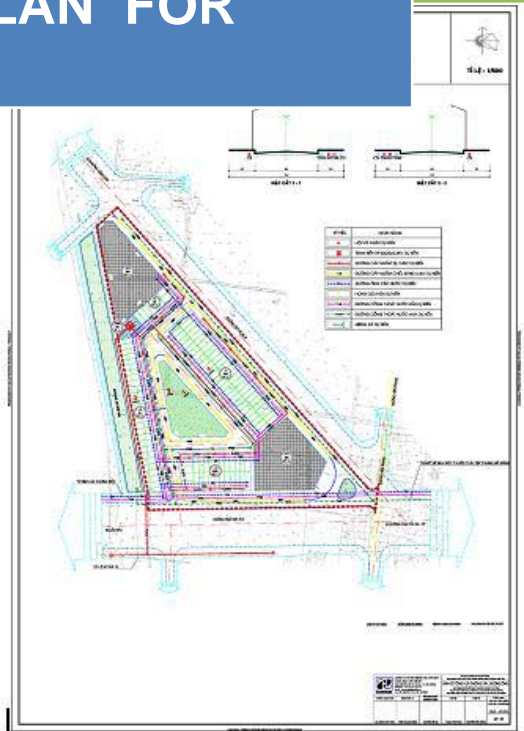


Hai Phong Department of Transport
Regional Transport Works Project Management Unit

ENVIRONMENTAL IMPACT ASSESSMENT
HAIPHONG URBAN TRANSPORT DEVELOPMENT PROJECT

Volume 3:
ENVIRONMENTAL IMPACTS ASSESSMENT &
ENVIRONMENTAL MANAGEMENT PLAN FOR
RESETTLEMENT SITES



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ABBREVIATIONS

CMC	·	Construction Management Consultant
CPC	·	City People's Committee
CENRE	·	Center for Environmental Research
DONRE	·	Department of Natural Resources and Environment
DPC	·	District People's Committee
EIA	·	Environmental Impact Assessment Report
EMP	·	Environmental Management Plan
EM		Environmental Management
ESC	·	Environmental supervision consultant
HCDC	·	Hai phong construction design and consultant joint stock company
MONRE	·	Ministry of Natural Resources and Environment
NTR	·	National Technical Regulations
PMU	·	Project Management Unit
VS	·	Vietnam Standard
WB	·	World Bank

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SUMMARY

The resettlement sites of the Hai Phong Urban Transport Development Project has been selected and designed based on the Master Plan of Haiphong city in general and of Le Chan, Kien An, Hai An and An Duong districts in particular. The number of households to be relocated for the construction of the main road (Bac Son – Nam Hai) will be 1757.

12 resettlement sites located in four districts of Hai Phong, namely An Duong, Kien An, Hai An and Le Chan has been selected to accommodate the above-mentioned 1757 households and other seven households which are currently living in these resettlement sites but need to be allocated. Taking into account the possibilities that some young families will be separated from their parent's current households, a total of 1776 land slots has been allocated in the following resettlement sites:

- An Duong district with 4 resettlement sites (RS) to accommodate 542 households.
- Kien An district with 2 RS, to accommodate 244 resettled households.
- Le Chan district with 1 RS to accommodate 116 resettled households.
- Hai An district with 5 Resettlement sites to accommodate 874 resettled households.

The project will finance ground leveling and construction of basic infrastructures for each resettlement sites such as roads, power and water supply, drainage, sewerage and public areas such as parks and kindergartens. During the preparation phase of the main project, feasibility study for resettlement sites have been carried out in accordance with Hai Phong city's masterplan toward 2025.

97.5% of existing land use to be acquired for resettlement sites is currently agricultural land including irrigation ditches. In addition, 20 households will also be affected. Among those, seven households will be displaced and the remaining 13 households will be affected with agricultural land only thus resettlement is not required. In addition, approximately 3,000 m² (0.8% of land use) of existing ponds will be filled up to designed elevation and five graves will have to be relocated.

Resettlement Policy Framework (RPF) and Resettlement Action Plan (RAP) has been prepared and will be implemented as part of the Hai Phong Urban Transport Development Project.

Environmental and safety risks associated with resettlement sites includes: (i) safety risks associated with unexploded materials that may be left at the sites from the war and existing 35 KV, 110KV and 220KV electrical safety corridors that runs along the borders of some resettlements sites, (ii) dust and noise pollution, particularly on households and public buildings living along access roads to the resettlement sites; (iii) local traffic disturbance, reduced road safety and degradation on existing rural roads which will be used as access roads to the sites; (iv) wastes and wastewater generated from excavation and workers' camps; (iv) impacts on soil and water quality due to the wastes generated from construction activities; and (v) increased pressure onto the resources and public services (water and power supply, drainage, waste management, education etc.) during operation phase of the resettlement areas;

Feasibility for the resettlement sites included proposals on parks, water supply, drainage and sewerages, power supply etc. to address the major impacts during operation phase; Accessibility on roads for the disabilities on roads has also been considered. Such proposals will be detailed by engineering solutions during detail design. Mine clearance will be carried out as standard practice in every construction projects in Vietnam and the estimated cost has been included in total project cost estimation. The potential impacts during construction phase will be addressed by the implementation of the Environmental Management Plan which include general site management plan and site-specific mitigation plans. The implementation of such mitigation plans will be monitored by PMU, construction supervision engineers, independent monitoring consultants and community representatives.

Policies, Legal and Administrative Framework

Environmental impact assessment Report for "Hai Phong Urban Transport Development Project" was prepared based on the requirements of Vietnam's existing environmental legislations and the World Bank safeguard policies.

Vietnamese Legal Basis

- The Law on Environmental Protection, No 52/2005/QH11 approved by the National Assembly on 29.11.2005;
- Land Law approved by the National Assembly on November 26th, 2003 and promulgated by Order No. 13/2003/QH11 on December 10th, 2003 by the President, with effect from July 1st, 2004.
- The Law on Construction No. 16/2003/QH11 dated 26/11/2003.
- Decree 197/ND-CP December 7th, 2004 by the Government about resettlement support and compensation.
- Decree 80/2006/ND-CP August 9th, 2006 by the Government about guiding the implementation of the Environmental Protection.
- Decree 21/ND - CP on 28/02/2008 about amendment and supplement of some articles of Decree No. 80/2006/ND - 09 -08 -2006 CP of the Government on detailed regulations and guide the implementation of some articles of Law on Environmental Protection
- Decision No. 22/2006/QD-MONRE December 18th, 2006 about compulsory of Vietnam standard application on Environment.
- Decree No. 59/2007/ND-CP April 09th, 2007 of the Government about solid waste management.
- Circular No.05/2008/TT issued on December, 8th, 2008 by the Ministry of Natural Resources and Environment guiding the preparation of strategic environmental impact assessment, environmental impact assessment and the environmental protection commitment.
- Decision No. 16/2008/QD-MONRE December 08th, 2008 of MONRE about promulgation of National technical regulation on Environment.

- Decree No. 12/2009/ND-CP February 12th, 2009 of the Government about construction investment project management, and Decree No. 112/2009/ND-CP December 14th, 2009 of the Government about construction investment cost management.
- Decree No. 209/2004/ND-CP December 16th, 2004 of the Government about construction works quality management; Decree No. 49/2008/ND-CP April 18th, 2008 of the Government about reformation of Decree No. 209/2004/ND-CP
- Contract No. 02/ HD-QLDA dated 20/01/2010 between. Project Management Unit of Hai Phong transportation works project and Association between Center for Environmental Research & Hai Phong construction design and consultant joint stock company.

Applicable Vietnamese Standards

- National Technical Standard (NTS) 05: 2009/MONRE - National Technical Standard on ambient air quality.
- NTS 06: 2009/MONRE - National Technical Standards on hazardous substances in ambient air.
- NTS 19:2009/MONRE: National Technical Standards on emission standard for dust and inorganic.
- NTS 08:2008 NTS / MONRE - National Technical Standards for Surface Water Quality.
- NTS 09:2008 NTS / MONRE - National Technical Standards on Underground water Quality.
- NTS 14:2008 NTS / MONRE - National Technical Standards on wastewater quality
- 03-2008 NTS - National Technical Regulations on allowed limit of heavy metal in soil.
- Vietnamese Standard (VS) 6438-2001. Allowed maximum limits of emissions for traffic means.
- VS 5948-1999. Acoustics. Noise from traffic means. Allowed maximum noise level.
- VS 5949-1998. Acoustics. Noise of public areas and residential areas. Allowed maximum noise level.

- VS 6962-2001. Vibration and shake. Vibrations caused by construction activities and industrial production. Maximum level for industrial and residential Environment.

Administrative Framework

- Feasibility study report of the resettlement are
- Technical designed drawing
- Geological survey report about the resettlement areas

The World Bank Safeguard Policies:

- Operation policy OP/BP 4.01: Environmental Assessment
- Operation policy OP/BP 4.12: Involuntary resettlement
- Public Consultations and Information Disclosure

EIA Team and Preparation Methodology

Methodology

In the process of preparing EIA reports, the following method has been used:

- Collect necessary documents, desk review of existing documents, develop report outline;
- Field investigation: investigate, survey the environmental current status, take samples of soil, air and water , carry out rapid assessment of water quality in the field.
- Analysis in Lab: analyze chemical and physics characteristics of soil, water, air samples in Lab and compare with Environmental quality standard to assess base environment in the project area. Carry out social survey: survey and interview the local people and leaders in the project areas.

Table 1 - List of equipments used for rapid assessment of environmental quality

No	Name of Equipment	Environmental component
1	HS7-KIMOTO (Air sample gained machine, Japan)	Air
2	Dust monitoring machine - Casella (England)	Air
3	Noise monitoring machine - SIRRUS (England)	Air
4	Water quality machine- TOA 22A (Japan)	Water
5	Land and water sample equipments	Water, land

- Data processing: collect, process and analyze meteorological, hydrological, environmental and social-economic data related to the project. Comparison: compare data collected with environmental standards issued by Ministry of Natural Resources and Environment on soil, water, noise, air quality and other environmental standards.
- Consultation: through meetings to gain public and local authorities opinions about solutions to mitigate the negative impacts of the project.

Environmental Impact Assessment Team

EIA report for Hai Phong Urban Transport Development Project has been being carried out jointly by the Centre for Environmental Research and Hai Phong Construction Design Donsultant JSC from January, 2010 to October 2010.

+ Representative: Mr. Duong Hong Son – Director

+ Office: No. 23/62 Nguyen Chi Thanh - Dong Da district, Hanoi

+ Phone: 04 3 7733 159 Fax: 04 3 7733 159

Table 2 - List of people EIA preparation team

No	Name	Organi- sation	Qualification	Position	Tasks assigned
-	Dinh Thai Hung	CENRE	PhD. Environment	Head of group	Leader in writing EIA report and Environmental management plan
-	Do Manh Toan	HCDC	BA. Environment	Head of group	Environment survey
-	Do Thi Thanh Binh	CENRE	Engineer Biotechnology	Expert	Community consultation
-	Nguyen Thi Thanh Hoai	CENRE	MSc. Environment	Expert	Observation, measurement for environmental parameters
-	Nguyen Van Thanh	HCDC	Engineer. Environment	Expert	environmental Observation
-	Nguyen Thanh Tuong	CENRE	MSc. Environment	Expert	Planning Environmental management
-	Tran Thi Dieu Hang	CENRE	MSc. Environment	Expert	Analyzing datas
-	Ha Thi Lien	CENRE	Engineer. Hydrology	Secretary	administrative activities.

CHAPTER 1: PROJECT DESCRIPTION

1.1 Project Name

HAI PHONG URBAN TRANSPORT DEVELOPMENT PROJECT

Prepare Environmental Impact Assessment Report and Environmental Management Plan for the resettlement sites of the Hai Phong Urban Transport Development Project.

1.2 Project Owner

Investment Owner: Haiphong People's Committee

Project owner: Hai Phong Department of Transportation

Representative of Investor and Project Management: PMU of Transportation Works

Representative: Mr. Vu Duy Tung

Position: Director

Address: No 32 - Dien Bien Phu road - Ngo Quyen district – Hai Phong

Number phone: 031.3859935

Fax: 031.36859990

1.3 Geographical locations

The Project has proposed 12 resettlement sites with total area of 377,344.49 m² (Equivalent to 37.73ha) in 4 districts of Hai phong namely An Duong district, Le Chan district, Kien An district and Hai An district, The Table 3 below list the names and land areas of each resettlement sites:

Table 3 - Location, Lan Area and households of resettlement area

District	Resettlement site	Land Area (m ²)
An Duong	Bac Son	44,406.21
	Le Loi	20,586.00
	Dang Cuong	83,773.25
	Hong Thai	13,693.81
Kien An	Dong Hoa 1	25,720.00
	Dong Hoa 2	20,708.04

District	Resettlement site	Land Area (m²)
Le Chan	Vinh Niem	19,074.00
Hai An	Dang Hai	31,362.00
	Nam Hai 1	14,370.18
	Nam Hai 2	22,496.00
	Nam Hai 3	25,189.00
	Trang Cat	55,966.00
Total		377,344.49

The locations of the resettlement sites are shown in Figure 1

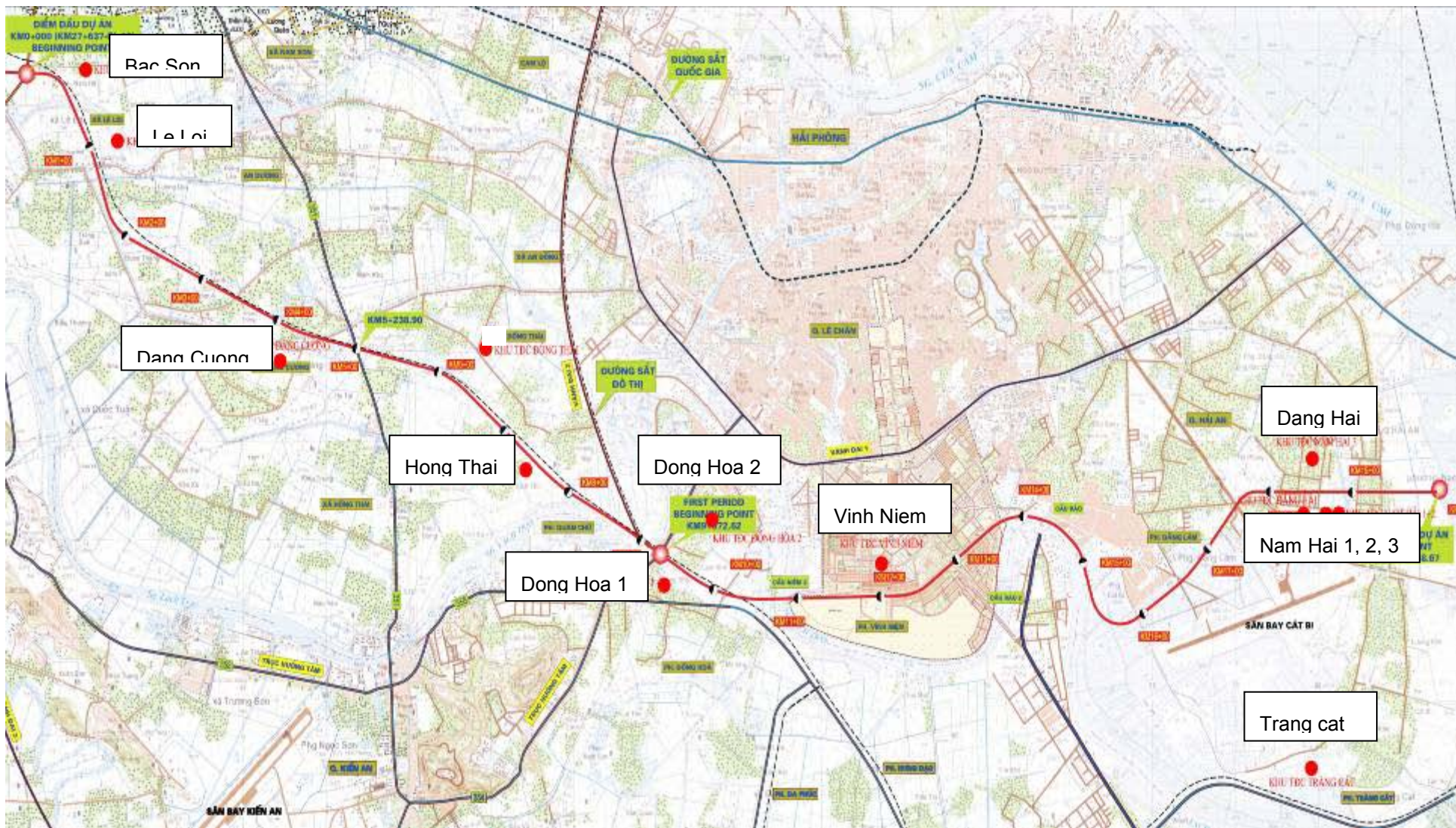


Figure 1- Location Map of Resettlement Area

An Duong rural district is bordered with Hai Duong province to the West and Western North, bordered with An Lao rural district to the Western South, bordered with Kien An district to the South, Thuy Nguyen rural district to the North, Hong Bang and Le Chan to the Eastern South.

Kien An is the gateway in the Western South, 10 km from the centre of Hai Phong City, located in the traffic nodes of roadway, waterway, airway connecting Kien An with Haiphong centre, Do Son, Cat Ba, Ha Long bay to the sea direction; connecting Kien An with An Lao, Vinh Bao in the bio-ecological tourist alignment “countryside sightseeing”. Kien An airport is the back-up of Cat Bi airport.

Le Chan is an urban district of Haiphong with borders to Ngo Quyen district and partly with Kien Thuy rural district to the East; Kien An and An Duong district to the West; Kien Thuy district to the South and Hong Bang district to the North.

Hai An district is situated in the Eastern South of Haiphong city; bordered with Ngo Quyen district and Thuy Nguyen rural district to the North, with Lach Tray river and Kien Thuy rural district to the South, with Cam river to the East, with Ngo Quyen district and Lach Tray river to the West.

1.4 Overview on Resettlement Program

1.4.1 Objectives

- Meet the demands for resettlement housing, to mitigate the negative impacts of land acquiring in the implementation of Hai Phong Urban Transport Development Project.
- Develop a new urban residential area with complete technical and social infrastructure, and appropriate architecture to create beauty for the area and the city. Set the conditions to speed up the eco-social development of the city on the basis of the viewpoint of sustainable development.
- Minimize the negative impacts on accommodation and living conditions for the project affected households.
- Meet the desires of the households that new accommodation must be better than the old one, contributing to accelerating the successful implementation of Hai Phong Urban Transport Development Project.

1.4.2 Entitlement for resettled households

- Eligible for resettlement include: (i) households/individuals whose residential land and houses are totally acquired and they have no land to live in the same commune/ward/ township where the land is acquired, (ii) households/individuals whose residential land and houses are acquired; their remaining area of land after being acquired is not large enough for living according to the regulations of the City People's Committee; and they have no land to live in the same commune/ward/ township where the land is acquired, and (iii) households where many generations are living together (many couples; eligible to separate into nuclear households; and have the same ownership to a parcel of land, will be facilitated to live in a resettlement site. Other cases, who are not eligible to the project resettlement criteria but have no land to live, will be allocated land in resettlement areas for building houses and will be provided with corresponding support policies for resettlement.
- Land allocation for resettlement ranges from 40 to 180 m² depending on the different locations in Haiphong.
- More details on arrangements for resettlement are presented in Project Resettlement Policy Framework and Resettlement Action Plan.
- Hai Phong City People's Committee planned 12 resettlement sites in the city for resettlement. After received land plots, citizens build their houses by themselves. Project Owner arrange for design layout for each resettlement site, leveling and construction of infrastructures including roads, water and power supply, drainage and sewerage systems.

1.4.3 Proposed Works to be covered by the Project

1.4.3.1. Ground Leveling

Based on the topographical survey result scale 1/500 of 12 resettlement areas prepared by the Construction design consultant JSC in March 2010, the average existing elevation is from + 2.30 to + 3.30. In order to suit the overall planning of the city, the planned elevation of these 12 resettlement areas is selected with level + 4.2 according to Haiphong elevation. The project covers leveling works at all of these sites.

1.4.3.2 Construction of Basic Infrastructure

The project design and build infrastructures including roads, water supply, drainage and sewerage, power supply as indicated in Table 4 below.

Table 4 – Infrastructures Investments in the resettlement areas

Resettlement site	Leveling (m2)	road (m)	Drainage (m)	Sewerage (m)	Water Supply (m)	Power Supply (KVA)
An Duong	162,459.27	8207.84	8879.7	9177.6	20740	1301
Bac Son	44,406.21	1938.94	2108.6	1989.1	4117	395
Le Loi	20,586.00	1149.9	1295.1	1399.1	2140	141
Dang Cuong	83,773.25	3781	4324	4189	6927	652
Hong Thai	13,693.81	1338	1152	1600.4	7556	113
Kien An	46,428.04	2859.5	5022	3555	3624	703
Dong Hoa 1	25,720.00	2050.4	3588	2505	2354	395
Dong Hoa 2	20,708.04	809.1	1434	1050	1270	308
Le Chan	19,074.00	855.67	1037	857	906	273
Vinh Niem	19,074.00	855.67	1037	857	906	273
Hai An	149,383.18	5882.56	6185	5900	6818	2089
Dang Hai	31,362.00	899.21	1117	988	1379	461
Nam Hai 1	14,370.18	713.12	620	679	979	273
Nam Hai 2	22,496.00	951.56	862	745	544	341
Nam Hai 3	25,189.00	639.01	895	575	884	275
Trang Cat	55,966.00	2679.66	2691	2913	3032	739
Total	377,344.49	17805.57	21123.7	19489.6	32088	4366

Roads

The following type of roads will be built for the resettlement sites:

Table 5 - Typical design parameters of the roads within and surrounding RS

No	B (m)	Footpath (m)	Number of side having footpath
1	3	3m	1
2	3.5	0m	
3	3.5	4m	1
4	3.5	7m	1
5	4.5	1x3=3m	1
6	4.5	5m	1
7	6	4m	1
8	6	2x3=6m	2

No	B (m)	Footpath (m)	Number of side having footpath
9	6	7m	1
10	7.5	2x3=6m	2
11	7.5	2x3.75=7.5m	2
12	9	2x3=6m	2
13	9	2x5=10m	2
14	11.25x2	2x7	Divider 3.5

* Road Base and Road surface structure

- Surface road structure:

+ Hot asphalt concrete with medium drop, thick 7 centimeters

+ Absorbed adhered standard asphalt 1kg/m²

+ Wedged Macadam I K98, thick 15 centimeters and Wedged Macadam II K98, thick 15 centimeters

- Road base structures:

+ soil compaction to K98, thick 30 centimeters

+ compaction of black sand K95, thick 30 centimeters

Before leveling road base, replace 50 centimeters of top soil with K90 black sand in road - bed position

- Sidewalk structure: Sidewalk is tiled by structured block brick

Trees will be planted on sidewalk in 1.1 x 1.1 meters squares, distance between squares is 8 meters. Squares are built by concrete stone, section B x h = 12 x 15 centimeters.

Water Supply

The pipes will be connected to existing water pipes on Highway 5 and 10, 208 and 351 provincial roads, Truong Chinh street, Le Hong Phong Street. The size of water supply pipes are D40, D50, D63, D75, D90, D100, D110, D125, D140, D160, D200, D225. - The main water pipeline and fire hydrants will be galvanised steel pipes installed on the pavement at average depth of 1.0 m. At the corners, vaults, tee and supports will be installed. At the nodes and the point before each household connection, valve chambers will be installed to facilitate system maintenance and operation.

Water supply system is planned with fire hydrant water supply system (the minimum pressure is 10m). The water head was arranged at the T-junction and crossroads and along the pipeline with a distance not exceeding 250m. Fire hydrants shall be located in each resettlement area with section D100.

Water supply line is deepened under the sidewalk along the road system, the average depth of pipe from 0.7 m to 1.2 m. Water supply pipes are used to be HDPE with a cross section from D50 to D225 and HDPE PN8 with section from D40 to D140. Depending on the size of area, number of households in each resettlement area where arrange pipes to suit.

Drainage

Storm water drainage system

- Storm water drainage system is designed along the roads. Culvert section with all kinds of D300, D400, D1000, D1200, culverts section were selected in line with the size of each resettlement area.
- The rain water collection manhole shall be located at the roadside, 40 m apart on average, the collection manhole and the test manhole, connected by horizontal drains with a diameter of D400.
- Depth at top drain averaged at 0.7 m to 1.0 m, the minimum inclination of drain face $i_{\min}=0.2\%$ for vertical drains and $i = 1\%$ for horizontal drains.
- Foundations made of M200 pre-cast reinforced concrete placed on the 20 cm thick layer of grit buffer
- The collection manhole and the test manhole made of XM M75 brick mortar, terminal mouth covered by M250 pre-cast reinforced concrete (stone 1x2), stucco plastered inside and outside by XM M75 mortar, lined foundations by M100 concrete (stone 4x6).

Sewage system

- sewerage will be uPVC pipe class 3.
- Foundation made by black sand with 20 cm thick.
- The collection manhole and the test manhole made of XM M75 brick mortar, terminal mouth covered by M250 pre-cast reinforced concrete (stone 1x2), stucco plastered inside and outside by XM M75 mortar, lined foundations by M100 concrete (stone 4x6).

Power Supply

- The power supply for resettlement will be connected to the commune substation or 6KV electric network next to the planning land.
- Power supply for residential areas, public facilities in the resettlement area with 0.4 kV power grid, using underground cable system in ditches, protected the system by head Aptomat.
- In each resettlement area, substations are arranged to meet electricity demand from households. Substation structures KIOSK style with the size $D \times R \times C = 3200 \times 1900 \times 2300$, shell station with sheet metal, electrostatic painting 3mm thick, quality standards of IP54.
- + Foundation type structure of reinforced concrete: lined foundation concrete (# 100 stone 4x6); concrete foundation (# 200 stone 1x2), cable through foundation station is threaded through $\phi 150$ plastic tube.
- + Street Lighting in urban areas shall be grade C.
- + Designing, arranging lamp poles on the road pavement, lamp poles and edge of pavement stand 1m apart, 8m or 10m high lamp pole, the average distance of 35-40 m.
- + Two lighting control panel will be installed on the streets.

1.4.3.3 Material sources for construction

Black sand will be bought from supplier from Thai Binh (Hai Duong), crushed sand will be supplied from borrow pit near Cam bridge, delivered by waterway to Lan Be yard, Cau Rao, Kien An... Macadam stone of all sorts is produced in Minh Duc quarry – Thuy Nguyen, transported by waterway to the yards: Highway 5, Cau Rao, Lan Be, Kien An, etc....

- Stone quarry: Trang Kenh, Phi Liet, Minh Duc in Thuy Nguyen rural district, stone is transported by river way to the yard of Highway 5, Lan Be then delivered by truck to the site.
- Embanking land quarry: Xuan Son, Tien Hoi, Thai Son in Xuan Son commune , An Tien ward, An Lao rural district near Highway 10 are being exploited with good quality products. The land quarry has reddish yellow clayed rubble land is used for road embankment.

1.5 Resettlement implementation schedule

The project will be implemented in two years (from the second quarter, 2011 to the 4th quarter, 2013), progress of construction items are summarized in following table:

Table 6 – Implementation Schedule

Item	2011		2012				2013				
	Quarter		Quarter				Quarter				
	3	4	1	2	3	4	1	2	3	4	
Approve the project	X	X	X								
Make and approve engineering design		X	X								
Invite bids, bids for contract		X	X	X							
Ground leveling		X	X	X							
UXO clearance			X	X							
Build road bed				X	X	X	X	X			
Leveling				X	X	X	X				
Build water supply and drainage, electric systems				X	X	X	X	X	X		
Build road surface								X	X	X	
Build sidewalk with trees								X	X	X	

1.6 Total investment costs

The total investment is calculated on the basis of the volume of construction infrastructure, social infrastructure of the basic design include:

- Costs for construction and equipment: Leveling the ground, irrigation refund, the road surface, pavements, trees, storm water drainage systems, sewage systems, water supply systems, power supply system, public lighting system.
- The cost of other related construction, such as: Preparation of investment, investment execution and completion of the project.

Project investment total: **544.388.412.000 dong (VND)**

In words: Five hundred and forty four billion, thirty hundred eighty eight million, four hundred twelve thousand Vietnamese dong.

Equivalent to **28,652,022 USD** (exchange rate 1USD = 19.000 VND).

The invested capital of the Project is mainly from city budget.

CHAPTER 2: PHYSICAL AND SOCIO-ECONOMIC SETTINGS OF PROJECT RESETTLEMENT AREAS

2.1 Physical Conditions

2.1.1 Haiphong Geographical Location

Haiphong is a coastal city, situated to the East of the Coastal North, 102 km from Hanoi, with the total area of 152,318.49 ha, occupied 0.45% the area of the whole country. Administratively, the City is bordered with Quang Ninh province to the north, with Hai Duong province to the west, with Thai Binh province to the South and with the East sea to the east.

Geographical co-ordinates of the city: From 20⁰30'39' – 21⁰01'15' northern latitude; From 106⁰23'39' – 107⁰08'39' east longitude. Haiphong's geographical location is convenient for exchange with other provinces of the country and neighboring countries through traffic roads, railway, water way and airway system.

Haiphong northern terrains are of midland region with deltas mixed with hills. Meanwhile, the south of the city has low and relatively even terrain of a typical delta directing to the sea.

Figure 2.1 shows the map of Hai Phong City. The project area is located in four districts: An Duong, Le Chan, Kien An, Hai An.

2.1.2 Geological characteristics of the resettlement sites

Through geological processes, stratify of resettlement sites concluded:

- Class cropland: composition by clay, yellow loam, brown-gray loam, dark gray clay and organic compounds. The average thickness of 0.48 m - 1.2m
- Filling land: composition of gray-brown clay, yellowish gray clay and organic Substance. The average thickness of 0.63m - 1.60m
- Soft plastic clay layer: combined by yellow, light gray clay, soft plastic state clay and brown iron oxide clotted. The average thickness of 0.8m - 7.0m
- Clay, loam: yellow Land, light gray Land, gray-brown and quick plastic state Land, sometimes soft plastic Land. The average thickness of 1.03m - 2.30m

- Clay mud layer: Land is gray, gray brown, dark gray; liquid state. And decomposition of organic compounds. Sometimes alternating strips sandwiched thin silt loam. The average thickness of 1.20m - 10.0m.
- Loam layer: land is gray, gray-brown, gray and white, soft plastic state. The average thickness of 0.33m-3.30m
- Loam mud: Land is gray, dark gray; flowing state. And decomposition of organic compounds. The average thickness of 1.65m - 8.20m
- Quick Plastic clay layer: Land is gray, light gray, quick plastic state. And mussel shells and decomposed organic compounds. The average thickness of 3.80m - 12.0m
- Hard plastic, soft plastic: Land with yellow, gray, light gray, soft plastic state - hard plastic. Iron oxide and hard brown form of capital shortage. The average thickness of 8.0m.
- Soft plastic clay layer: land yellow, gray-brown, gray and white, soft plastic state. Iron oxide and hard brown form of capital shortage. The average thickness of 0.90m
- Hard plastic clay layer: land yellow, gray-brown, gray, hard plastic state. Iron oxide and hard brown form of capital shortage. The average thickness of 2.7m



Figure 2: Hai Phong City Location

- Fine-grained sand layer: Sand is a pale, gray-white composition is mainly fine-grained sand. Tight structure. Depth of bottom layer may be not determined. The details of the geological characteristics of land layers in each resettlement site referenced in the feasibility study report.

2.1.3 Climate Features

Haiphong climate is characterized by common features of the Northern Delta with its own feature of a coastal city. The area of island and mountain has sub-climate of tropical monsoon climate.

Under the effect of the circulation of Eastern – South monsoon, particularly the zonal air block, the climate in the region is divided into two seasons:

- It is hot, wet and rainy in Summer; lasting from May to October annually.
- It is cold and less rains in Winter, lasting from September to April of the subsequent year.

Because the terrains run from the coast, Haiphong climate is intensively affected by the sea with temperate climate: Warm in Winter, cooler than the deeply inland areas in Summer. However, since it is directly impacted by storms, high fluctuation of rain mechanism, it usually bears flood which cause effects to agricultural production.

Temperature

The coastal climate manifests itself the most clearly in the temperature mechanism. Temperature does not drop as much as that in the delta centre. Three months of winter has temperature lower than 20⁰C, but temperature is as high as > 40⁰C in summer.

- Average annual temperature: 23.6⁰C
- Temperature: 32.1⁰C
- Monthly lowest average temperature: 13.7⁰C
- Absolute Monthly highest average highest temperature: 41.5⁰C
- Absolute lowest temperature: 4.5⁰C

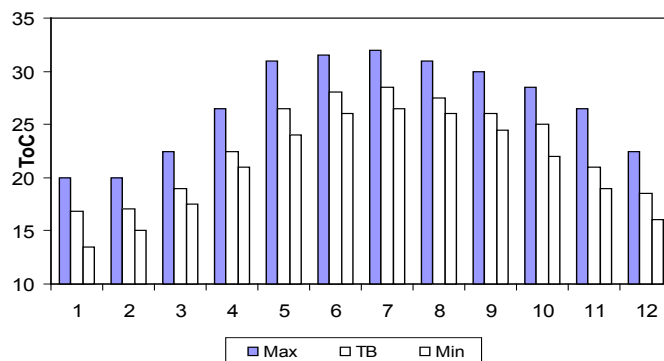


Figure 2.2 Typical indications of Haiphong temperature

Precipitation

The precipitation is rather evenly distributed. The annual average rainfall of Haiphong is 1494.7mm. At the project area, the average rainfall on annual basis is 1808mm with the number of rainy days of 153 days.

The rainy season lasts six months, from May to October. The rainfall in rainy season makes up for above 80% that of the entire year. It increases from the season start to the middle of rainy season and stands at maximum level in August (when storms occur on a regular basis in this region) with the average rain fall of up to 350mm.

From November to April, it rains less. The beginning months of winter is the time when it rains least. Light rain is observed for 6-8 days every month. The month with minimum

rainfall is January from 20 -:- 25mm. The second half of winter is the time of wet drizzle rain. Although the rainfall does not rises much in comparison with the first half, the number of rainy days clearly increases. (10 -:- 15 days per month).

Typical mechanism of rain of the Project area:

- Average annual rainfall: 1808mm
- Monthly highest average rainfall: 348.6 mm
- Monthly lowest average rainfall: 25.0 mm
- Average number of rainy days: 153 days

Humidity, Sunlight

The project area has annual average humidity of 85%. The highest humidity occurs in February, March, April. In the drizzle rainy months, the average humidity is up to 90%. The driest period is the beginning months of winter (June, July), the average humidity is lower than 80%.

Total sunny hours in a year is more than 1600 hours. In general, it is sunny a lot throughout summer with more than 160 hours/month. The sunniest month is July with total average hours of 190 hours.

Wind, Storms

In winter (from June to March), wind often blows mainly in two directions: Eastern North or North. 3.9 - 4.4 m/s on average. In summer (from April to October), wind often changes directions into Eastern South o South, velocity is from 4-:-5 m/s on average.

Average velocity in a year is about 3.7 m/s, the strongest wind is in summer, when there are cyclones and storms, the velocity can reach 40 m/s in the storm. In winter, when monsoon comes, a rush of wind can reach velocity of 20m/s.

2.1.4 Hydrology

- Haiphong has a thick river network, with average density from 0.6 – 0.8km/km². Haiphong rivers are mainly branches of Thai Binh river flowing into the Tonkin Gulf. Haiphong has 16 main rivers spreading all over the city with total length of 300 km, including Thai Binh river, Lach Tray river, Cam river, Da Do river, Bach Dang river...

- Hydrological mechanism of Haiphong river is rather complicated, affected by the hydrological mechanism of river (flood from upper source) and directly affected the hydrological mechanism of sea with the complicated daily tide mechanism.
- The proposed resettlement sites has plenty of ponds, channels to drain water to the surroundings. Thus, the surface drainage condition within the area is quite good. Underground water level in project area is relatively high, usually coincides with the surface water level in the rainy season. In the dry season, the water level changes from +1.0 to 1.5m. The upper underground water is brackish water. From our point of view, the underground water may possess concrete corrosion property.

2.2 Current status of water, soil and air

Sampling were carried out at typical locations, is baseline to assess the impact during construction and operation of Hai Phong resettlement project.

2.2.1 Air Quality

Generally, currently air quality in the resettlement sites is very good: PM10 concentrations as well as total suspended solids at most monitoring sites are below the allowed standards, SO₂, NO₂, CO are within allowed limits of NTR 05:2009 / MONRE

Table 7: Measured Air quality at the resettlement sites

No	Parameter	TSP	CO	NO ₂	SO ₂
	Unit	µg/m ³	µg/m ³	µg/m ³	µg/m ³
1	Bac Son K1	89	1150	87	78
2	Bac Son K2	87	1170	88	75
3	Le Loi K3	63	910	65	70
4	Dang Cuong K4	67	1450	120	73
5	Dang Cuong K5	65	1390	117	72
6	Dang Cuong K6	68	1470	121	75
7	Hong Thai K7	75	1200	98	87
8	Hong Thai K8	70	1150	94	83
9	Dong Hoa 1 K9	57	1230	127	97
10	Dong Hoa 1 K10	58	1280	125	95
11	Dong Hoa 2 K11	110	1180	83	95
12	Vinh Niem K12	62	1490	62	65
13	Dang Hai K13	98	1070	95	82
14	Nam Hai 1 K14	72	1567	72	70

No	Parameter	TSP	CO	NO2	SO2
	Unit	µg/m3	µg/m3	µg/m3	µg/m3
15	Nam Hai 2 K15	78	1350	78	84
16	Nam Hai 3 K16	68	1210	72	75
17	Trang Cat K17	62	1170	68	57
	NTR 05:2009/MONRE	300	30000	200	350

Comments and assessment:

- According to results of quality of air factors and microclimate in table 2.2:
- CO content is from 860 to 1567 µg/m³, is less than NTR 05:2009 many times
- NO₂ concentration is from 62 to 127 µg/m³, about 1.5 times less than NTR 05:2009.
- SO₂ content is from 57-97 µg/m³, 3.6 times less than NTR 05:2009.
- Suspended dust content (TSP) is from 57-110µg/m³, 2.7 times less than NTR 05:2009.

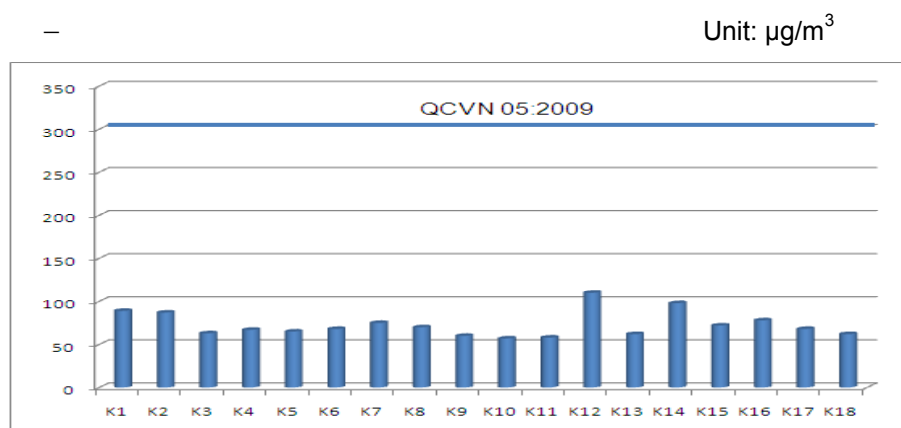


Figure 3: Dust concentration at observed sites compared with QCVN

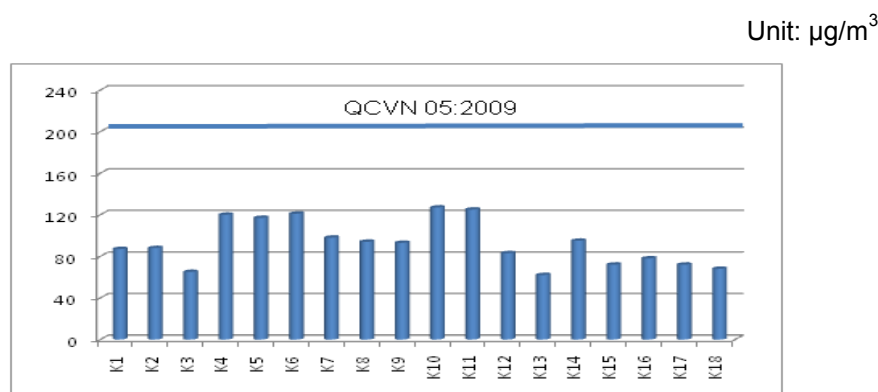


Figure 4: NO₂ concentration at observed sites compared with QCVN

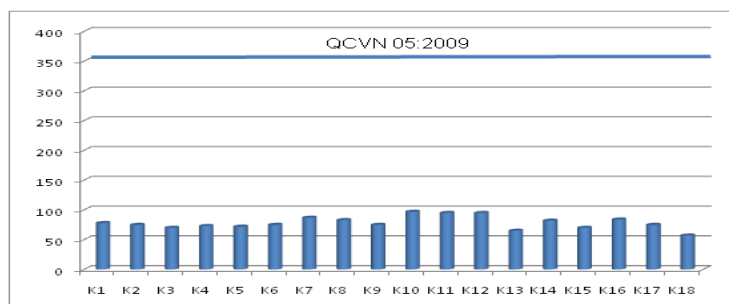


Figure 5: SO2 concentration at observed sites compared with QCVN

Generally, air quality in the project area is very good, concentration of CO, NO₂, SO₂ are less than allowed standard many times

2.2.2 Current Noise levels

Noise is measured at the same time with air quality sampling. Measured noise levels are shown in Table 8 below.

Table 8: Current status of noise at the resettlement sites

Parameter	Leaq	Lmin	Lmax	Parameter	Leaq	Lmin	Lmax
Unit	dBA	dBA	dBA	Unit	dBA	dBA	dBA
Bac Son K1	48.2	44.3	62.8	Dong Hoa 1 K10	54.3	46.1	65.9
Bac Son K2	48.4	44.4	63	Dong Hoa 2 K11	58.6	48.1	69.5
Le Loi K3	46.6	43.2	61.5	Vinh Niem K12	61.1	51.6	70.2
Dang Cuong K4	47.8	43.7	62.2	Dang Hai K13	48.8	44.5	63.0
Dang Cuong K5	47.4	43.3	61.9	Nam Hai 1 K14	50.6	45.1	64.7
Dang Cuong K6	48	44.1	62.5	Nam Hai 2 K15	52.8	46.8	65.4
Hong Thai K7	50.2	44.8	64.4	Nam Hai 3 K16	54.2	47.5	66.3
Hong Thai K8	49.7	44.5	63.2	Trang Cat K17	53.7	47.2	65.7
Dong Hoa 1 K9	56.7	47.8	67.1	VS 5949:1998	75	-	-

Table 8 indicated that noise level at the proposed resettlement sites are less than standard. Generally, noise source is mainly from vehicle.

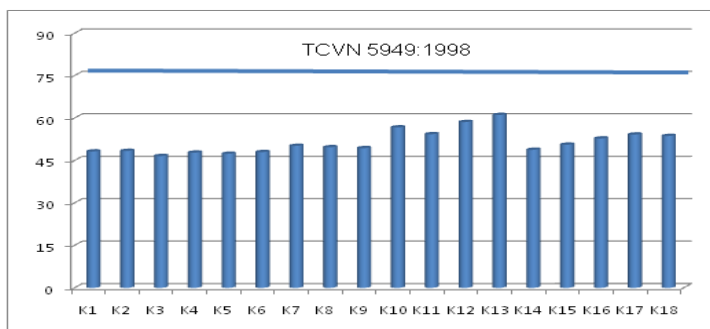


Figure 6: Noise level at observed sites (unit: dBA)

2.2.3 Current status of Water Quality

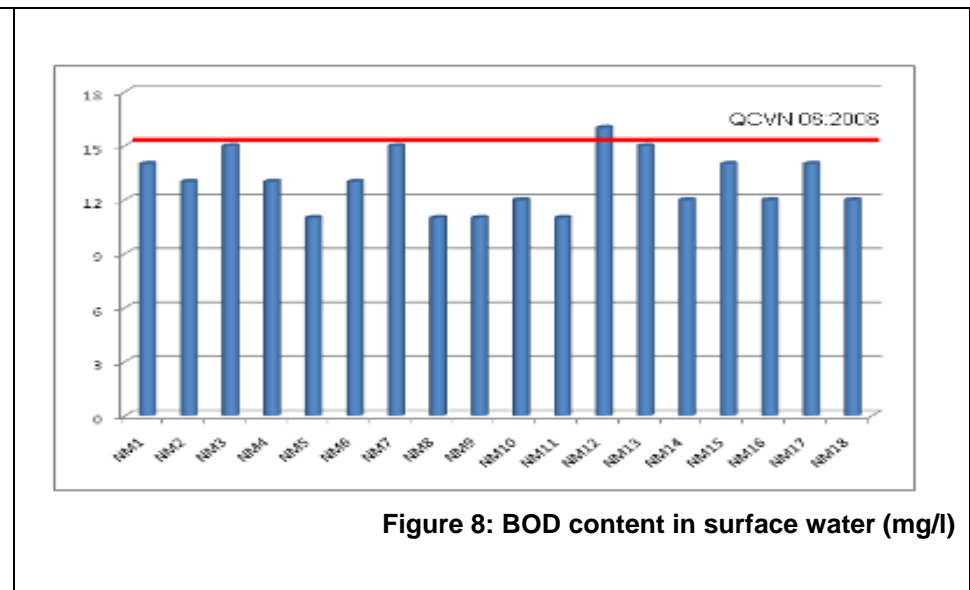
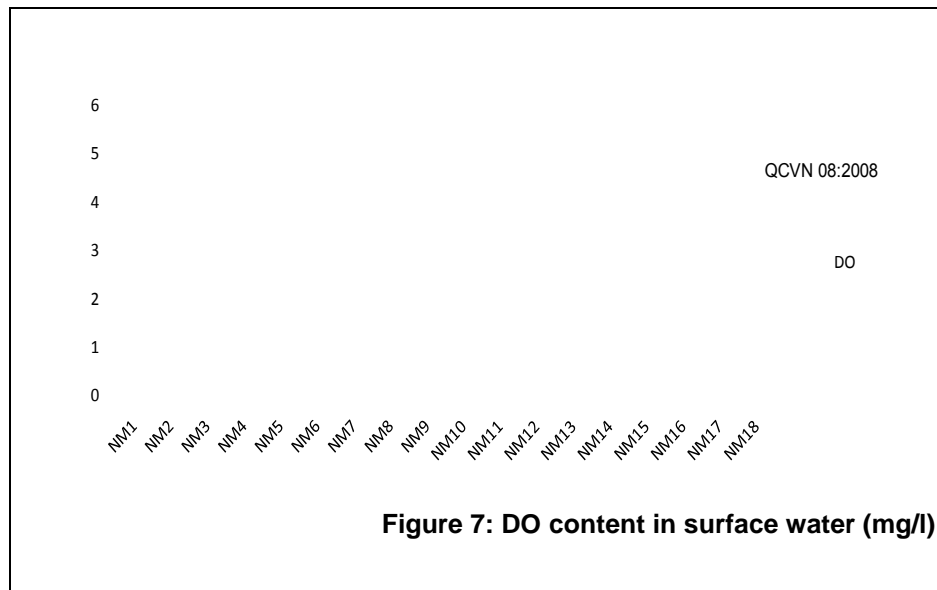
2.2.3.1 Surface water

Surface water quality parameters were measured at channels or in the residential area nearby the resettlement site

Table 9: Result of measuring and analyzing surface water quality

TT	Parameter	Temperature	pH	DO	COD	BOD	TSS	Amoni	Total N	Total P	Fe	Coliform
	Unit	°C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	MPN/100ml
1	Bac Son NM1	27.3	6.8	5.6	23	14	10.5	0,22	0.08	0.1	0.13	8500
2	Bac Son NM2	27.3	6.8	5.5	23	13	10.3	0.21	0.08	0.09	0.12	9000
3	Le Loi NM3	28	6.9	4.5	27	15	13.2	0.31	0.11	0.09	0.21	11500
4	Dang Cuong NM4	26.8	6.5	4.1	29	13	12.2	0.39	0.28	0.17	0.14	15000
5	Dang Cuong NM5	26.7	6.5	4.3	26	11	11.8	0.35	0.26	0.14	0.12	14000
6	Dang Cuong NM6	26.8	6.6	4.3	30	13	12	0.38	0.28	0.16	0.15	15500
7	Hong Thai NM7	27.1	7	5.2	22	15	10.3	0.27	0.12	0.12	0.17	18000
8	Hong Thai NM8	26.9	6.8	4.9	20	11	10.2	0.26	0.12	0.1	0.18	16000
9	Dong Hoa 1 NM9	26.1	6.8	4.5	29	12	11.8	0.18	0.09	0.1	0.14	20000
10	Dong Hoa 1 NM10	26.3	6.6	4.6	25	11	10.9	0.21	0.1	0.12	0.17	17000
11	Dong Hoa 2 NM11	25.6	6.6	4,6	33	16	13	0.38	0.13	0.27	0.1	18000
12	Vinh Niem NM12	27.1	6.9	4,2	34	15	12	0.42	0.18	0.3	0.11	12000
13	Dang Hai NM13	26.5	6,4	4,4	28	12	11,4	0.31	0.09	0.23	0.14	13500
14	Nam Hai 1 NM14	27.2	6.7	4.6	25	14	12.3	0.38	0.14	0.13	0.09	11000
15	Nam Hai 2 NM15	26.9	6.8	4.5	25	12	11.9	0.36	0.14	0.14	0.1	13000
16	Nam Hai 3 NM16	27	6.7	4.6	23	14	12.1	0.38	0.13	0.12	0.09	14000

TT	Parameter	Temperature	pH	DO	COD	BOD	TSS	Amoni	Total N	Total P	Fe	Coliform
	Unit	°C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	MPN/100ml
17	Trang Cat NM17	26.5	6.4	4.2	27	12	10.6	0.25	0.1	0.18	0.15	11500
	NTR 08:2008	-	5.5 -9	>4	30	15	50	0.5	10	0.3	1.5	7500



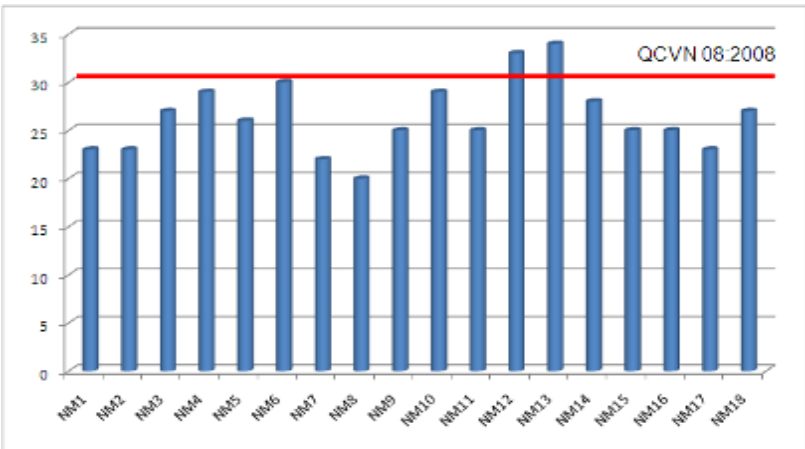


Figure 9: COD content in surface water (mg/l)

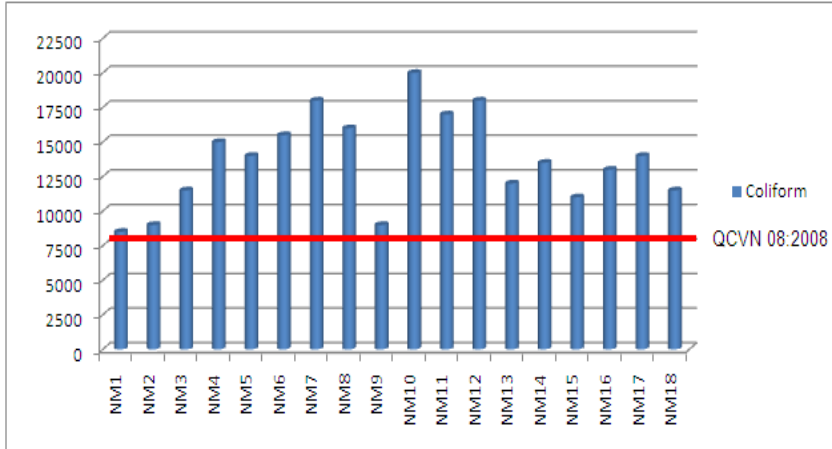


Figure 10: Coliform content in surface water (MPN/100ml)

Compare to NTR 08:2008 (column B1), the most of parameters are in allowed standard (pH, DO, TSS, Amoni, Total N, Total P, and Fe). At some sites, COD and BOD are more than allowed standard, however, excess content is insignificant.

Total Coliform exceed allowed standard many times, because this is residential area

2.2.4 Underground water

Underground water is sampled in the resettlement sites by consultant at drilled well or well.

Table 10: Measured underground water parameters

TT	Parameter	PH	COD	Amoni	Cl	NO2-	As	Fe	Mn	Coliform	E.Coli
	Unit	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	MPN/100ml	MPN/100ml
1	Bac Son NN1	6.6	3	0.008	7.1	0.001	0.006	2.51	0.05	3	KPH
2	Bac Son NN2	6.4	2	0.009	6.9	0.001	0.005	2.35	0.06	2	KPH
3	Le Loi NN3	6.8	3	0.009	6.8	0.002	0.007	1.87	0.07	2	KHP
4	Dang Cuong NN4	6.5	2	0.008	10.7	0.006	0.01	1.12	0.09	1	KPH
5	Dang Cuong NN5	6.4	2	0.007	10.1	0.005	0.008	1.07	0.07	1	KPH
6	Dang Cuong NN6	6.5	2	0.008	10.5	0.005	0.009	1.09	0.09	0	KPH
7	Hong Thai NN7	6.7	2	0.006	9.5	0.007	0.003	0.98	0.12	2	KPH
8	Hong Thai NN8	6.5	1	0.006	8.7	0.005	0.003	1.02	0.09	0	KPH
9	Dong Hoa 1 NN9	6.5	4	0.011	14	0.003	0.005	0.81	0.11	0	KPH
10	Dong Hoa 1 NN10	6.6	2	0.008	12.6	0.002	0.004	0.74	0.1	0	KPH
11	Dong Hoa 2 NN11	6.4	2	0.012	12.4	0.008	0.008	1.1	0.17	2	KPH
12	Vinh Niem NN12	6.7	3	0.011	9.5	0.004	0.007	1.22	0.15	3	KPH
13	Dang Hai NN13	6.8	4	0.009	11.3	0.007	0.005	1.06	0.12	0	KPH

TT	Parameter	PH	COD	Amoni	Cl	NO2-	As	Fe	Mn	Coliform	E.Coli
	Unit	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	MPN/100ml	MPN/100ml
14	Nam Hai 1 NN14	6.6	2	0.01	9.2	0.008	0.002	1.04	0.16	2	KPH
15	Nam Hai 2 NN15	6.8	2	0.007	18.4	0.005	0.004	0.81	0.11	3	KPH
16	Nam Hai 3 NN16	6.5	3	0.009	13.4	0.007	0.003	0.78	0.13	3	KPH
17	Trang Cat K17	6.7	2	0.006	11.8	0.006	0.004	1.15	0.11	3	KPH
	NTR 09:2008	5.5-8.5	4	0.1	250	1	0.05	5	0.5	3	KPH

Table 2.10 indicates that

- All parameters are in allowed standard of NTR 09:2008/MONRE
- pH, COD, Fe, Mn, Coliform at all sites are in allowed standard.
- Amoni, Cl, NO₂ and Asenic in underground water are less many times than allowed standard.

2.2.5 Soil

Metal contents in soil at the resettlement sites were measured

Table 11: Result of measuring and analyzing land

No	Parameter	Cu	Pb	Zn	Cd	As	Excess amount pesticides
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1	Bac Son D1	12.2	4.72	20.4	0.18	0.016	0.006
2	Bac Son D2	11.8	4.65	19.9	0.17	0.016	0.006
3	Le Loi D3	15.3	4.02	17.5	0.27	0.029	0.007
4	Dang Cuong D4	16.5	3.96	13.6	0.35	0.021	0.008
5	Dang Cuong D5	14.7	3.97	13.2	0.33	0.016	0.006
6	Dang Cuong D6	15.2	3.97	13.5	0.33	0.018	0.005
7	Hong Thai D7	13.2	3.77	15.7	0.11	0.037	0.007
8	Hong Thai D8	12.4	3.06	14.6	0.07	0.038	0.004
9	Dong Hoa 1 D9	12.1	3.22	18.4	0.31	0.032	0.006
10	Dong Hoa 1 D10	11.7	2.98	16.2	0.23	0.027	0.005
11	Dong Hoa 2 D11	18.7	5.06	19.2	0.13	0.024	0.003
12	Vinh Niem D12	16.5	5.72	15.6	0.23	0.015	0.004
13	Dang Hai D13	14.8	3.46	13.8	0.28	0.026	0.006
14	Nam Hai 1 D14	12.6	3.98	18.7	0.17	0.032	0.005
15	Nam Hai 2 D15	18.3	4.06	19.1	0.15	0.021	0.007
16	Nam Hai 3 D16	17.8	4.13	17.9	0.16	0.022	0.006
17	Trang Cat K17	17.6	5.02	16.2	0.21	0.024	0.004
	NTR 03:2008	50	70	200	2	12	-

Table 11 shows that land quality in the resettlement sites is not polluted, heavy metal content is in allowed standard of NTR 03:2008/MONRE

2.2.6 Current status of ecological environment

Investment proposals route through fields, irrigation canals or other residential areas. The animals and plants are mainly pet, animal, have economic value rather than ecological value.

Particularly, the road in Vinh Niem ward has riverside area has ecological and landscape value. Consultant has conducted detailed surveys in this area. The species composition and associated ecological functions have been identified:

Plants (common species, characterized species, endemic species ...)

- Characteristics: In the project area, common species are such as coconut, banana, mango, ... The wild species that characterize riparian areas, alluvial like reeds, grass strabismus... Besides, there are also trees for shade, the green trees along the banks of ponds, roadside, dike.
- Importance: generally plant is not diverse flora, no endemic species, characterized species are coconut and banana.

2.3 Socio-economic features

2.2.1 Demographic and Administrative settings

According to 2009 economic report of provinces/ districts of Hai Phong city, area, population and administrative unit showed in below table.

Table 12: Land Area, population and administrative units in resettlement districts

Order	Administrative unit	Number of precinct, commune, town	Area (km ²)	Population (person)	Density (person/km ²)
1	An Duong commune	1 town + 15 communes	98.29	139683	1557
2	Kien An district	10 precincts	29.6	83191	2872
3	Le Chan district	15 precincts	12.31	207.000	16815
4	Hai An district	8 precincts	88.39	74734	809

2.3.1. Economic condition of communes/wards having resettlement

2.3.1.1. General situation

12 resettlement sites are built at 9 wards/communes namely Bac Son, Le Loi, Dang Cuong, Hong Thai, Dong Hoa, Vinh Niem, Dang Hai, Nam Hai and Trang Cat in four

districts: An Duong, Le Chan, Kien An and Hai An. Economic condition of the wards/communes is summarized as follow:

- Total of production value of 3 economic sectors in 2009 are exceeded 2008 with increased rate from 3% to 11%.
- Part of the communes is still agricultural economy, the proportion of the agricultural sector contributing to the budget of communes is still relatively high from 25-47% (the percentage of contribution in wards is smaller and larger in communes).
- Manufacturing industry - small industry, trade - service continues to develop diversified satisfying for consumer needs of the people, including garment, construction, hotels, food, construction materials, ... people's lives is improved and gradually raised.
- The structure of economic sectors tend to reduce the proportion of the agricultural sector, increasing the proportion of industry and services.
- Average income per person in the wards are greater than 9 million VND (or USD 500) per year (income of the communes in An Duong district is lower than the wards in Kien An, Hai An and Le Chan districts).
- However, the percentage of poor households occupy from 3 - 4.5%.

In recent years, investments on infrastructure in the wards / communes have been being prioritised: inter-village, inter-communal roads, schools and kindergartens, irrigation, sanitation facilities, street lighting systems, power lines, water supply pipelines gradually improved...

Education: kindergarten, primary, secondary, high school meet standard, quality of education in 3 grades are high. Completion of high school programs, socialization and education are interested, the study promotion fund is built and invested by wards/communes.

Culture and social development: radio systems in the communes are equipped to public the policies and guidelines of the Party, State and People's Committees.

Public health: good health care services such as examination or treatment has been provided. Information campaign, disease prevention and food safety are implemented well.

Social welfare policy, poverty reduction is done well in proposed resettlement sites.

2.3.1.2. Socio-economic situation of effected households

During the period from 19/3/2010 until 20/7/2010, Consulting group of resettlement of the project has conducted surveys and questionnaires to investigate the social and economic assets for the affected 214/886 households were directly affected on 12 wards in 04 local district of projects. Sample structure is shown as follows:

Table 13: Structure of number of surveyed people

N0	District	Commune, Ward	Consulted households
1	An Duong District	Bac Son Commune	20
		Le Loi Commune	16
		Dang Cuong Commune	36
		Hong Thai Commune	29
2	Kien An District	Dong Hoa ward	20
3	Le Chan disctrict	Vinh Niem ward	21
4	Hai An District	Dang Hai ward	15
		Nam Hai ward	66
		Trang Cat ward	25
Total			248

According to survey results and census of affected people, made by the Center for Environmental Research, Urban transportation development Project of Haiphong city could affect 871 households and 15 organizations with a total of 4,223 people.

All affected people are the Kinh (100%). No ethnic minorities in project areas. The average size of affected households is 4.85 persons per household, the average percentage of men is 50.3% of the total affected population, slightly higher than the percentage of women (49,7%). Number of belief households is 17, or 0.1% of the total affected households.

The average education level of those affected by the project are relatively high, with a number of years of schooling is 10-11 years per person. There are very few illiterates among those affected by the project and all of them are elderly.

The main income of the affected households including salaries paid by the State-own organizations, agriculture production, bussiness, service, salary retirement ...

The number of households below the poverty line is low, less than 10% in the suburban communes of An Duong district and Hai An district, meanwhile in the inner city wards

this ratio ranges from 5% to 6%, relatively consistent with the general poverty level of the city.

Most water supply systems in urban areas are from surface water sources, an estimated 30% of water supply from underground water sources.

Hai Phong City does not have any sewer separated from drainage system. Wastewater systems are discharged in a common with rainwater collection system; the percentage of population using the drainage system in urban centers only reach about 35-40%. For suburban communes in resettlement areas, mainly water penetration by itself or through a system of irrigation ditches

Solid waste from the suburban villages in RS almost not collected and uncontrolled throw along the canals, empty land or collected and treated by local people themselves.

2.3.2 Land use in proposed resettlement sites

2.3.2.1 Hai Phong city's plan of land use

Scale of urban construction land

- By 2015, urban land will be approximately 23 -24 thousand ha with target of 145 square metres per person, in which residential land will be about 95 -109 hundred ha with target of 65,5 square metres per person.
- By 2025 urban land will be approximately 475 – 489 hundred ha with target of 160 square metres per person (in centre urban city) in which residential land will be about 171 hundred ha with target of 70 - 84 square metres per person (in centre urban city), 180 square metres per person (in satellite urban city).

Orientation of Hai Phong Urban Space Development

a) Develop new urban areas.

- Upgrade existing urban areas and develop new urban areas.
- Expand urban areas to the outskirts, mainly toward the East, South East, along Provincial Road 353 (Pham Van Dong Road to Do Son Town), and Northwest following National Highway 5.
- Develop areas along Ha Noi- Hai Phong Expressway, National Road No. 10, northern coastal highway.
- Develop Cat Hai Island, Dinh Vu port, and Trang Cat.

- Develop satellite urban areas, upgrading existing town, establishing new town and new urban areas.

b) Functions allocated for each area:

- Residential urban areas: Total area of 7,539 ha.
- Extension toward the East: construct new residential houses in Hai An district. The total area is about 1008 ha...
- Extension toward the West, Northwest: Develop high- tech industrial parks (An Hong, Le Thien, Dai Ban, etc...) , extend Hong Bang district to An Duong rural district and one part of An Lao rural district, as to form civil, training areas and resorts at the city gateway. Total area is about 1,570 ha.
- Extension toward the South: Develop Kien An district to become a new urban area, and area tourist attraction based on the exploitation of landscape of Lach Tray River, Thien Van mountain. Total area is about 770 ha.
- Construct and complete existing entertainment centers in districts: Hong Bang, Le Chan, Kien An, Duong Kinh, Do Son and Cat Ba island.
- Areas for green space and sport: 3,890 ha
- + Green space and parks: 3,866 ha

c) Space organization of the suburban.

Hai Phong suburban area includes 8 rural districts with total natural area of 115,910.78 ha, accounting for 76 % of the whole city land area. And up to 2025, there will be 7 rural districts with total natural land area of 98,481.83 ha, accounting for 65% of the whole city area.

To 2025, the suburban population will be about 900 thousand persons, in which the population living in urban will be about 300 thousand persons and, population living in rural will be about 600 thousand people.

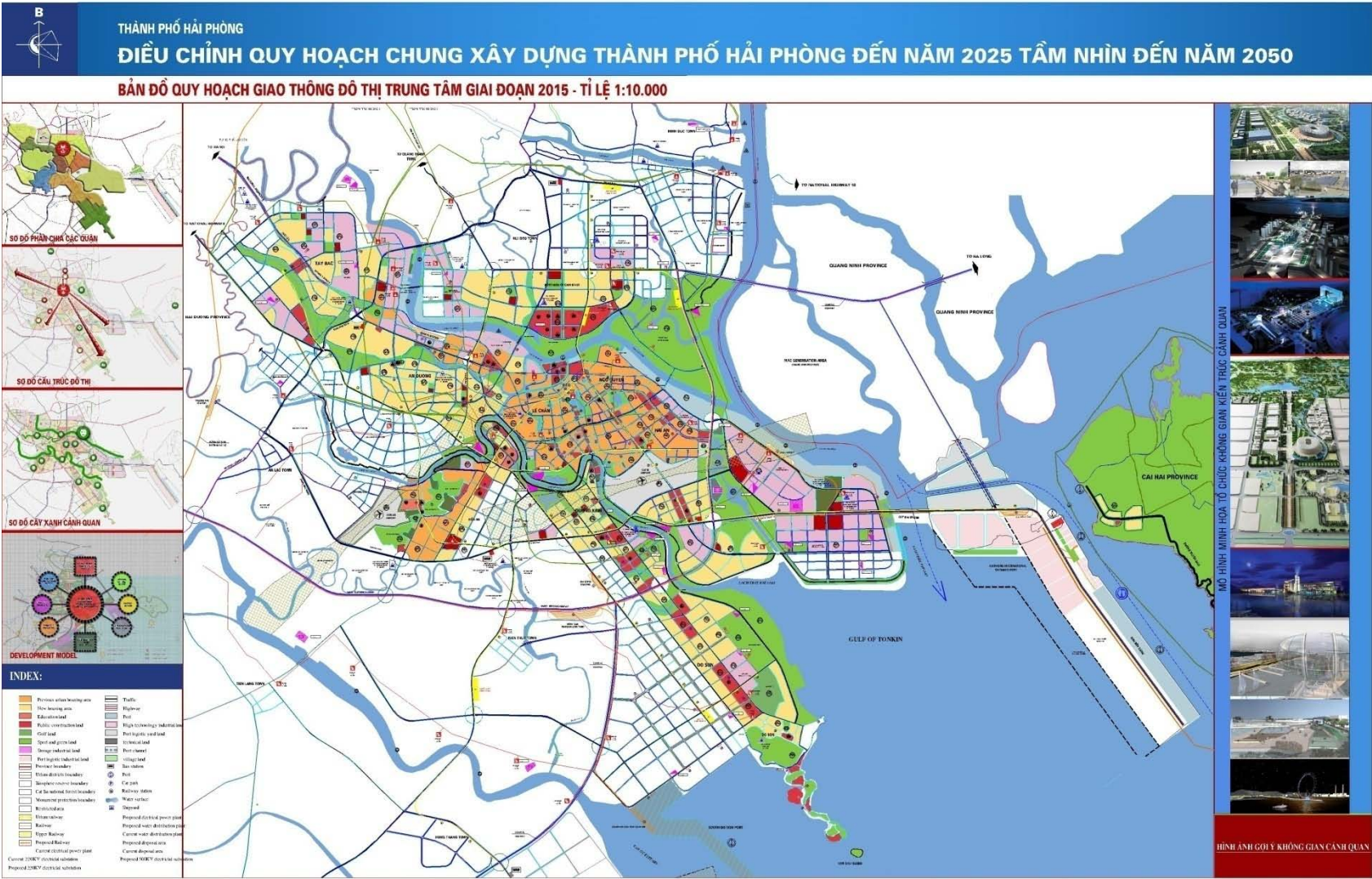


Figure 2.11 Planned land use in Hai Phong city

- Agricultural land: mainly located in the south of city, within rural districts: Vinh Bao, Tien Lang, Kien Thuy, and parts of northern Thuy Nguyen, and parts of the western An Lao.

Thus, building the resettlement site is essential to match the land using plan, consistent with the development planning of Hai Phong city. This contributed to a complete infrastructure system, the complete function of the suburbs, to meet the requirements of industrialization and modernization of rural and the financial meeting ability of Hai Phong City.

2.3.2.2. Existing land use at proposed resettlement sites

Existing land use in resettlement sites include: Resettlement sites land is mostly located nearby inter-communal road, flat terrain facilitate vehicle transporting equipment, raw materials for building. Detail land area in each resettlement shown in below table

Table 14: Land use types in resettlement site

District/ Commune	Total area (m2)	Existing land use			
		Residential (m2)	Agriculture land (m2)	Pond (m2)	Roads, path (m2)
An Duong	162,459.27	342.00	160,282.27	1,092.00	743.00
Bac Son	44,406.21	77.00	43,554.21	32.00	743.00
Le Loi	20,586.00	265.00	20,321.00	0.00	
Dang Cuong	83,773.25		82,713.25	1,060.00	
Hong Thai	13,693.81		13,693.81		
Kien An	46,428.04	478.80	42,142.46	778.75	3,028.03
Dong Hoa 1	25,720.00	478.80	24,420.17		821.03
Dong Hoa 2	20,708.04		17,722.29	778.75	2,207.00
Le Chan	18,0901.00		18,091.50		
Vinh Niem	18091.00	982.50	18,091.50		
Hai An	149,383.18	650.00	147,614.18	1,119.00	
Dang Hai	31,362.00		30,243.00	1,119.00	
Nam Hai 1	14,370.18		14,370.18		
Nam Hai 2	22,496.00		22,496.00		

District/ Commune	Total area (m2)	Existing land use			
		Residential (m2)	Agriculture land (m2)	Pond (m2)	Roads, path (m2)
Nam Hai 3	25,189.00		25,189.00		
Trang Cat	55,966.00	650.00	55,316.00		
Total	376,361.49	2,453.30	368,130.41	2,989.75	3,771.03

a. Bac Son

Existing land use: existing land use in proposed Bac Son resettlement site is agriculture land with rice fields as shown in the photos below. There is also one resident house (resettlement not required), ponds, pathway and ditch within the site. There are two grave at the south eastern and western side outside the border of the resettlement site.



Cultivating rice land in Bac Son resettlement site



Culture house outside resettlement site, possibly affected by building work

Accessibility: There are existing roads near the proposed resettlement site to the North and West of the site, a three meters wide concrete inter-commune road with medium surface quality on which traffic density is not high. Most of transport means are bicycles, motors, cars, improved carts, etc. Besides, there are pathways connecting existing residential land within the surroundings of the proposed resettlement site.

Existing infrastructure: In the resettlement site, it is mostly agriculture land so there is only irrigation cannal system on this site. And there are no other exiting infrastructures. Around the cornor on the northwest of the resettlement site, there is existng Ha Nam culture house (photo above), resident electric line, and inter-commune concrete road.

Social security and stability: local authority and people of Bac Son commune disseminates information regarding preventing social evils such as gambling, prostitutions, drinking etc), promoting environmental protection and hygiene, ensuring stability and security, etc. on regular basis to maintain social stability in the area.

b. Le Loi

Existing land use: In Le Loi resettlement site, currently agriculture land with rice cultivating land occupies 98.7% of total land area. There is also a small part of living land.

Accessibility: current access to the resettlement site is through low quality pathway. Besides, near the possible resettlement site there is a 5 meters wide inter-commune road which is of medium quality.

Existing infrastructure: In the resettlement site, there is mostly agriculture land and irrigation canals. Le Loi primary and secondary schools are located at the southern border of the site.



There is an existing access road to a chicken farm in South West of Le Loi resettlement site



Le Loi primary school is located in the South of Le Loi resettlement site

Social stability: local authority and people of Le Loi commune disseminates information on preventing social evils, protecting environment and hygiene, ensuring stability and security, etc. on regular basis

c. Dang Cuong

Existing land use: The site is far from residential areas. Agriculture land occupies 98.7% total area of resettlement site. The remaining land are ditches and unpaved path for accessing to crop land. There are 3 to 4 graves located in the southern part of this resettlement areas. Currently this area has dense inland irrigation canals.

Accessibility: the proposed resettlement site is surrounded by resident areas therefore approaching way system will be favorable. However, most of ways are unsealed and in low quality condition. An advantage of the resettlement site in Dang Cuong commune is having an existing road connecting the site with the existing national highway No 351 and with national highway No 10. This road is high quality ensuring demands for traffic in this area.

Existing infrastructure: In the resettlement site, safety corridors of a 35 Kv electric system runs in the North and East. There are also irrigation canals, pump and electric station. Outside the resettlement site to the north is An Kim Hai irrigation canal. And there are no health station, school, market, kindergaten near the resettlement site.

d. Hong Thai

Existing land use: Entire land of resettlement site is rice cultivation land.

Accessibility: in this area, there is a concrete village roads and dyke protecting road, which are not very convenience favorable.

Existing infrastructure: In the North of resettlement site, there is high voltage electric line. And there is no other infrastructure. Near the resettlement site, there is an irrigation cannal to the West.

e. Vinh Niem

Existing land use: Cultivation land occupies over 90% resettlement site. Five households are living in the proposed resettlement site. There are also some fish ponds in the proposed resettlement sites.

Accessibility: Now this area land is mainly agriculture, so approaching ways system to resettlement site is not comfortable for medium and big transportation.

Existing infrastructure: In the resettlement site only irrigation cannal. Near the resettlement site, there are no market, school, health station, pagoda, temple

g. Dong Hoa #1

Existing land use: Agriculture area occupies nearly 95.0% total resettlement site. The remaining is residential land of 10 households, ditches, unpaved path accessing crop land.

Accessibility: Approaching ways system to resettlement site comfortably: a concrete way system in resettlement site with good quality, however, small. The concrete way system

on this area connected with Truong Chinh street, so approaching ways system seem comfortable.

Existing infrastructure: Because mostly resettlement site is agriculture, infrastructure has irrigation canal, 110KV electric line, 22 KV electric line, electric station and concrete road. Near resettlement site, there are: children's hospital in the North, An Duong technology worker school in the East, Bach Nghe college in the East North

h. Dong Hoa #2

Existing land use: Occupying over 85% total resettlement site is agriculture, and pond land, ditch land, and crop land internal road. Detail land use state showed on table 2.10

Accessibility: traffic ways system approaching to resettlement site comfortably, a small concrete way system in the South, phía Nam, an asphalted road connected with Truong Chinh in the East

Existing infrastructure: There is mostly agriculture so resettlement site infrastructure is slow, only irrigation canal. Around the resettlement site, concrete and asphalt inter-commune system in the East and South, high electric and living electric line in the West

i. Dang Hai

Existing land use: Occupying over 96% total resettlement site is agriculture, and there is pond area for vegetable.

Accessibility: Currently there's an 5 meters wide asphalted road in the North and in good condition

Existing infrastructure: Around the resettlement site infrastructure, there is irrigation canal for cultivation. And near the resettlement site, there are no market, school, health station, kindergarten.

j. Nam Hai #1

Existing land use: Mostly area of resettlement site is agriculture.

Accessibility: traffic ways system approaching to resettlement site comfortably, there's an asphalted road with 5m wide in the North direction and interprecinct way system

Existing ininfrastructure: In the resettlement site, there is electric, market, health station, school. Near the resettlement site, Hai An high school in the South.



North of Nam Hai 1 resettlement site

k. Nam Hai #2

Existing land use: Mostly area of resettlement site is agriculture, and irrigation canal system.

Accessibility: traffic ways system approaching to resettlement site comfortably, there's an asphalted road with 5m wide, good quality, in the North of resettlement site, connected with Ngo Gia Tu street and leading to Nam Hai precinct People's Committee

Existing ininfrastructure: Resettlement site infrastructre such as electricity, market, health station, school has never existed



from the North of Nam Hai 2 resettlement site

l. Nam Hai #3

Existing land use: Mostly area of resettlement site is agriculture (cultivating farm land)

Accessibility: traffic ways system approaching to resettlement site comfortably,



interprecinct way system in the North direction of resettlement site

from the North of Nam Hai 3 resettlement site

Existing infrastructure: Resettlement site infrastructure such as electricity, market, health station, school has never existed.

m. Trang Cat

Existing land use: Nearly 99% Trang Cat resettlement site is agriculture, and living land, irrigation canal land, public land.

Accessibility: traffic ways system approaching to resettlement site comfortably in 4 directions: North and East has concrete way with 2 meters wide, good quality; South has an asphalted road with 5 meters wide and in good condition, leading to Trang Cat precinct People's committee; West has pathway.

Existing infrastructure: No existing infrastructure such as electricity, market, health station, school near the resettlement site, there is only irrigation canal. Around the resettlement site, there are Truc pagoda and a small temple in the West South of resettlement site.



Trang Cat precinct resettlement site

CHAPTER 3. ENVIRONMENTAL IMPACT ASSESSMENT

Environmental impact assessment for the resettlement sites of Hai Phong Urban Transport Development Project (where the reporting of environmental impact assessment and environmental management plan for the resettlement site), is made through three phases: Pre-construction phase, Construction Phase and Operation phase

3.1 Sources of impact

The sources of environmental impact through the stages of the project activities are presented in Table 15.

Table 15: Sources of environmental impact caused by project

Phase	Operations	Impacts
Pre-construction	Land acquisition	+ Waste generation
	Demolition of existing structures, relocation of graves	+ Disturbance to people's daily lives in the project area due to noise and waste, and machinery operations + Safety for workers and community related to UXO (unexploded objects from the war)
	Site clearance	+ Cultural impacts related to grave relocation + Impact on the public works
Construction	Mobilise workers to the sites	+ Disturb daily activities of local people around the resettlement sites due to movement of construction plants, loading materials and transportation activities.
	Temporary materials and stockpiles loading	+ Cut down of trees and vegetation are removed
	Build site-office and camps	+ Increased dust and noise during leveling and construction.
	Ground leveling	+ Increase toxic gas emissions from transportation activity and construction equipment
	roads construction	+ Increase the amount of waste water and domestic waste of workers
	water supply construction	+ Soil and water pollution due to oil /fuel/hazardous liquids Leakage
	Build drainage and sewerage	+ Labor accidents, occupational safety and health + disturb traffic in the project area.
	Build power supply facilities	+ Interrupt the operations of public works such as power supply, irrigation services
	Build sidewalk, plant trees	+ Social conflict between workers and local community due to difference on cultural background and customs + Temporary flooding when rain + safety for workers and community during construction phase

Phase	Operations	Impacts
Operation	Resettlement operation (families moved in after individual houses are built)	+ Increase the amount of waste water + Accumulation of garbage, sewage unpleasant odors + Impact on underground water due to culvert leaks, cracks + Increase the amount of solid waste + Heat balance between the activities of air conditioning systems, emissions from operating activities, cooking + Risk in operation phase (fire, explosion, gas leak ...)

3.2 Objects, scale and level of impact

Table 16: Objects, scale and extent of impacts caused by project

Impact	Subject	Impact scale		Level
		Location	Duration	
Pre-construction phase				
Land acquisition	affected people	12 Resettlement sites	Long term	High
Disturb life of habitant in the project area	affected people	12 Resettlement sites	Short term	High
Impact on agriculture, income	affected people	12 Resettlement sites	Short term	High
Impact on public works	community people in the resettlement sites	9 communes/ wards	Short term	medium
Impact on the safety of workers and local people from landmines left over	Workers and local people	internal 12 resettlement sites	Short term	Low
Cultural Impact on families having graves to be relocated	local people	internal 12 resettlement sites	Short term	Low
Construction phase				
Impact on life of local people around the resettlement sites.	Local people	Internal	Short term	Average
Impact on tree, vegetation	Biology resources in the project area	Internal	Short term	Low
Increase dust and noise when leveling	Habitant, worker, soil, air, water environment	9 communes/ wards	Short term	High
Increase emission from traffic and construction equipment	Habitant, worker, soil, air, water environment	9 communes/ wards	Short term	High
Increase wastewater and domestic waste by workers	Habitant, worker, soil, air, water environment	internal 12 resettlement sites	Short term	High
Oil leaking, labour accident, labour safety and health of worker, local people.	Habitant, worker, soil, water environment	9 communes/ wards	Short term	Low
Impact on traffic in the project area	Local people	9 communes/ wards	Short term	Low
Impact on public works: Temporary impact on inland I	Local infrastructure	9 communes/ wards	Short term	Average

Impact	Subject	Impact scale		Level
		Location	Duration	
canals, drainage, power line systems.				
Conflict between workers and local communities due to cultural differences	Habitant, worker	9 communes/ wards	Short term	Low
Temporary inundation when rain	Habitant, worker, soil, water environment	Internal	Short term	Low
Impact on the safety of workers and local people during construction projects.	Habitant, worker	9 communes/ wards	Short term	Low
Operation phase				
Increase wastewater	habitant in the resettlement sites	internal 12 resettlement sites	Long term	Average
Increase solid waste	habitant in the resettlement sites	internal 12 resettlement sites	Long term	Average
Accumulate solid waste, wastewater having odour	habitant in the resettlement sites	internal 12 resettlement sites	Long term	Low
Impact on underground water due to leaking and breaking culverts	Underground water	internal 12 resettlement sites	Short term	Low
Heat balance between the activities of air conditioning systems, emissions from operating activities, cooking	Air environment	internal 12 resettlement sites	Long term	Low
Risk in the operation phase (fire, explosion, gas leak...)	Natural environment and resident	internal 12 resettlement sites	Long term	Low

3.3 Impacts Assessment

3.3.1 Pre-construction phase

3.3.1.1. Site Clearance

Total land area to be acquired by the project is 37.48 ha in 12 resettlement sites of four districts namely An Duong, Kien An, Hai An and Le Chan. Total number of affected households is 886 (4223 people) including those affected with residential and/or agricultural land. In 12 resettlement sites, there are 20 households in the Bac Son, Le Loi, Vinh Niem, Dong Hoa 1 and Trang Cat are affected, in which 13 households are affected partly but can stay, 07 other households are affected entirely and have to be relocated.

In order to minimize the negative impacts of the project on social and economic life of the people with land losing or relocation, the Resettlement Policy Framework (RPF) and Resettlement Action Plan (RAP) has been prepared and will be implemented as part of the Hai Phong Urban Transport Development Project.

3.3.1.2. Safety risks related to landmines and explosives left over from the war

Landmines and explosives cause safety risks to the lives of workers and residents as well as workers in project area. However, this effect is considered to be very low due to the resettlement sites is the agricultural area under cultivation for a long time. This minor potential impact will be avoided as the project owner will hire licensed agencies to carry out mine clearance before handing over the site to the contractor. The cost of mine clearance for the resettlement sites has been budgeted in the project's total cost

3.3.13. Relocation of graves

A total of 05 graves will be relocated from the proposed resettlement sites. The relocation of the graves only affects some households, affecting their spiritual life of related families. However, the extent of this effect is not large as the number of graves to be relocated in each resettlement site is small as the project will pay allowance for households to relocate the graves whose owners are known. For graves whose owners are unknown, Project owner will coordinate with local authority and relevant authorities will arrange for relocation of such graves into designated cemeteries.

Table 17: Households affected residential land and agricultural land in resettlement sites

	Resettlement Sites	Number of households affected (NHA)				NHA > 30% Agricultural land	Household affected with Residential Land	Household affected with agricultural land	Total
		Residential land	Agricultural land	institutional	Total				
1	Bac Son	1	64	1	66	41	4	531	535
2	Le Loi	2	54	1	57	24	8	176	184
3	Dang Cuong		118	1	119	57		512	512
4	Hong Thai		21		21	17		62	62
5	Dong Hoa 1	10	34	1	45	21	40	225	265
6	Dong Hoa 2		59	1	60	18		296	296

	Resettlement Sites	Number of households affected (NHA)				NHA > 30% Agricultural land	Household affected with Residential Land	Household affected with agricultural land	Total
		Residential land	Agricultural land	institutional	Total				
7	Vinh Niem	5	59		64	28	23	253	276
8	Dang Hai		79		79	53		386	386
9	Nam Hai 1		54	3	57	20		234	234
10	Nam Hai 2		88		88	32		389	389
11	Nam Hai 3		100		100	56		439	439
12	Trang Cat	2	121	7	130	63	9	636	645
	Total	20	851	15	886	430	84	4,139	4,223

3.3.2 Construction phase

In construction phase, soil, water and air quality will be affected mainly from leveling, site clearance, materials loading and storage. The biggest impact is generated dust due to leveling, materials transportation and infrastructure construction for the resettlement sites.

3.3.2.1. Dust and exhaust gas emissions

During the construction phase of the resettlement sites, machinery and equipment, labor and construction materials are concentrated greatly. These activities cause air pollution in this period include:

Dust and emissions pollution from the digging activities

As a calculated result for the mass of digging soil in the resettlement sites, the total of excavated soil of 12 resettlement sites is 657,605.83m³ or 986,408.75 tons. The amount of generated dust is estimated as following:

$$E = k \times 0,0016 \times (U/2,2)^{1,4} / (M/2)^{1,3}$$

Where:

E – Polluted coefficient (kg/ton)

k – structure of sand, average is 0.35

U – average speed of wind (3.7 m/s)

M – Average humidity of material is 20%

As a result, the average polluted coefficient in the area is 0.023 kg/ton

The total amount of dust generated during the construction period mainly during the ground leveling, building of roads, building water supply systems with estimated time of 1.5 years (corresponding to 547 days) is = 22,821.0 kg. There is about 41.72kg dust generated on an average day. The amount of dust generated on a relatively large area of 37.48ha, so on an average day, the area of 01 ha will be about 1.11kg of dust generated.

Because the project area is mainly agricultural land and existing population density at resettlement areas is low, the impacts of dusts on people is expected to be small.

Dust pollution from other construction activities

During construction, dust is generated from material transportation and construction equipment. Also dust also arise in the course of gathering, storing raw materials. Impact of dust affects only place locally in handling, interrupt generated so no big impact. In addition, contractors will apply measures to minimize dust and fully equipped facilities for labor protection for workers. In short, the impact due to dust in the construction process is most important. Measures will need to be applied to reduce dust and ensure adequate labor protection equipment are provided to workers in order to protect the health and safety.

Pollution emissions from transportation of construction materials

The major types of emissions from the engines include CO, SO₂, NO₂. Emissions depends on many factors such as engines, engine capacity, fuel use, the operation of the air ... The toxic gases will affect the workers directly involved direct labor on construction sites, especially diseases related to respiratory tract. The levels of pollution by dust and toxic waste gases depends very much on the quality of roads, traffic volume, technical quality of vehicles and fuel volume consumed. To estimate the amount of dust and waste gas emitted we can use methods of pollution coefficient by the U.S. Environmental Protection Agency (USEPA) and the World Health Organization - WHO was given as 3.4 Table below:

Table 18: Pollution Score of transport used oil DO (kg/1000km)

Vehicles	Dust	SO ₂	NO _x	CO	VOC
----------	------	-----------------	-----------------	----	-----

Light Vehicles using diesel (load< 3.5 Ton)					
In City	0.2	1.16S	0.7	1	0.15
Out of city	0.15	0.34S	0.55	0.85	0.4
On the high-way	0.3	1.3S	1	1.25	0.4
Heavy Vehicles using diesel (load 3.5- 16 Ton)					
In City	0.9	4.29S	1.18	6.0	2.6
Out of city	0.9	4.15S	1.44	2.9	0.8
On the high-way	0.9	4.15S	1.44	2.9	0.8
Heavy Vehicles using diesel > 16 ton					
In City	1.6	7.26S	1.82	7.3	2.6
Out of city	1.6	7.43S	2.41	3.7	3.0
On the high-way	1.3	6.1S	1.98	3.1	2.4
Heavy Vehicles using diesel > 16 ton					
In City	1.4	6.6S	1.65	6.6	5.3
Out of city	1.2	5.61S	1.82	2.8	2.2
On the high-way	0.9	6.11S	1.39	2.1	1.7

Note: S is sulfur content in diesel oil

According to Table 3.4 and based on shipping method is expected during the construction, we choose the coefficient of pollution transport applied to heavy vehicles using diesel 3.5 tons - 16 tons load of running in urban as follows: Dust: 0.9 (kg/1.000 km.); SO₂: 4.29 S (kg/1.000 km.1vehicle) with S = 0.4%; CO: 6.0 (kg/1.000 km.1 vehicle); NO_x: 1.18 (kg/1.000 km.1 vehicle); and VOC: 2.6 (kg/1.000 km.1 vehicle). The total volume of excavated soil of 12 resettlement site is 657,605 m³, equivalent to 986,408 tons. Estimated volume total of stone, steel, cement ... about 60,000 tons. Thus the total volume of materials to be transported is 1,046,408.75. That would require about 65,400 vehicle times respectively (select 16 tons truck) to run for the entire process lasted 2.5 years (equivalent to 912 days) equivalent with about 90 vehicle times per day respectively.

Material is transported from Lan Be, Cau Rao, Kien An, Highway 5... to the resettlement sites with average distance of 5km. Thus km of movement per day is:

90 times x 5km x 2 = 900 km (two - way)

Table 19: Emissions of raw materials transportation vehicles

Dust, emission	Emission coefficient (kg/1000km)	Moving Distance (km/ one vehicle/day)	Operation time (hour)	Emission output (mg/s)
Dust	0.9	1210	12	18.75

CO	6.0			125.00
NO2	1.18			24.58
SO2	4.29S			89.38
VOC	2.6			54.17

From the load of calculated pollutants, apply the Sutton model to determine the average concentration of pollutants at any time with line waste source as follows:

$$C = \frac{0,8E \left\{ \exp \left[\frac{-(z+h)^2}{2\sigma_z^2} \right] + \exp \left[\frac{-(z-h)^2}{2\sigma_z^2} \right] \right\}}{\sigma_z \times u} \text{ (mg/m}^3\text{)}$$

Where:

C – pollutants concentration in the air (mg/m³); E – Load of pollutant from waste source (mg/s)

z – Elevation of calculated point (m); h – Elevation of road surface from land surface (m)

u – Average speed of wind in the area (m/s)

Diffusion coefficient of pollutant σ_z to vertical (z) with a stable of atmosphere in the project area is type B, is determined by the following formula: $\sigma_z = 0.53 \cdot X^{0.73}$ (m)

Where: x is the distance from calculated point to waste source by wind direction, calculated method: coordinate of points is divided to the horizontal axis (x) and vertical axis (z). For resettlement construction area, average wind speed in the area is 3.7 m/s. The stable level of atmosphere is type B. Diffusion coefficient σ_z depends on the diffusion level of atmospheric, value of σ_z to vertical was calculated by Slade with the type B of atmospheric stability.

Dust and pollutants concentration from the materials transportation are presented in Tables 20 to 24

Table 20: Result for predicting dust concentration TSP (mg/m3)

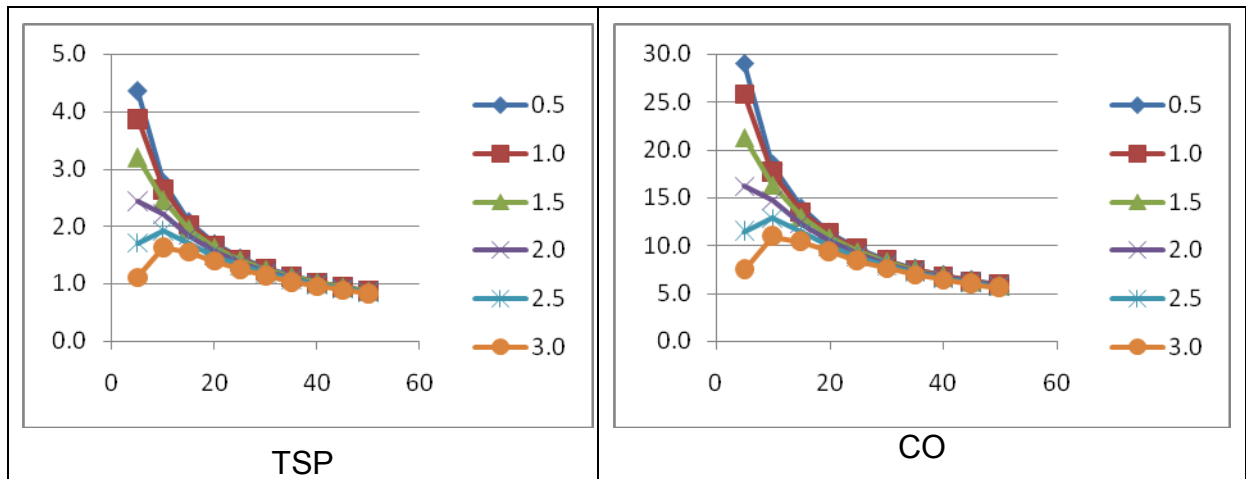
Distance x (m)	Elevation z (m)					
	0.5	1	1.5	2	2.5	3
5	4.356	3.877	3.191	2.430	1.710	1.113
10	2.763	2.642	2.452	2.208	1.930	1.637
15	2.083	2.031	1.948	1.837	1.703	1.553
20	1.698	1.670	1.625	1.563	1.487	1.399

25	1.448	1.430	1.402	1.363	1.315	1.258
30	1.270	1.258	1.239	1.212	1.179	1.140
35	1.136	1.127	1.114	1.095	1.071	1.042
40	1.031	1.025	1.015	1.000	0.982	0.961
45	0.947	0.942	0.934	0.923	0.909	0.892
50	0.877	0.873	0.867	0.858	0.847	0.833

Table 21: Result for predicting dust concentration CO (mg/m3)

Distance x (m)	Elevation z (m)					
	0.5	1	1.5	2	2.5	3
5	29.040	25.844	21.276	16.199	11.402	7.418
10	18.423	17.615	16.346	14.721	12.867	10.915
15	13.888	13.543	12.987	12.246	11.355	10.354
20	11.323	11.136	10.831	10.419	9.912	9.325
25	9.651	9.535	9.345	9.086	8.764	8.385
30	8.464	8.386	8.258	8.081	7.860	7.598
35	7.572	7.517	7.425	7.298	7.137	6.946
40	6.875	6.833	6.764	6.669	6.548	6.404
45	6.313	6.280	6.227	6.153	6.059	5.946
50	5.848	5.823	5.780	5.721	5.646	5.555

Figure 11: predicted of TSP, CO, SO2, Nox and VOC concentration on access roads



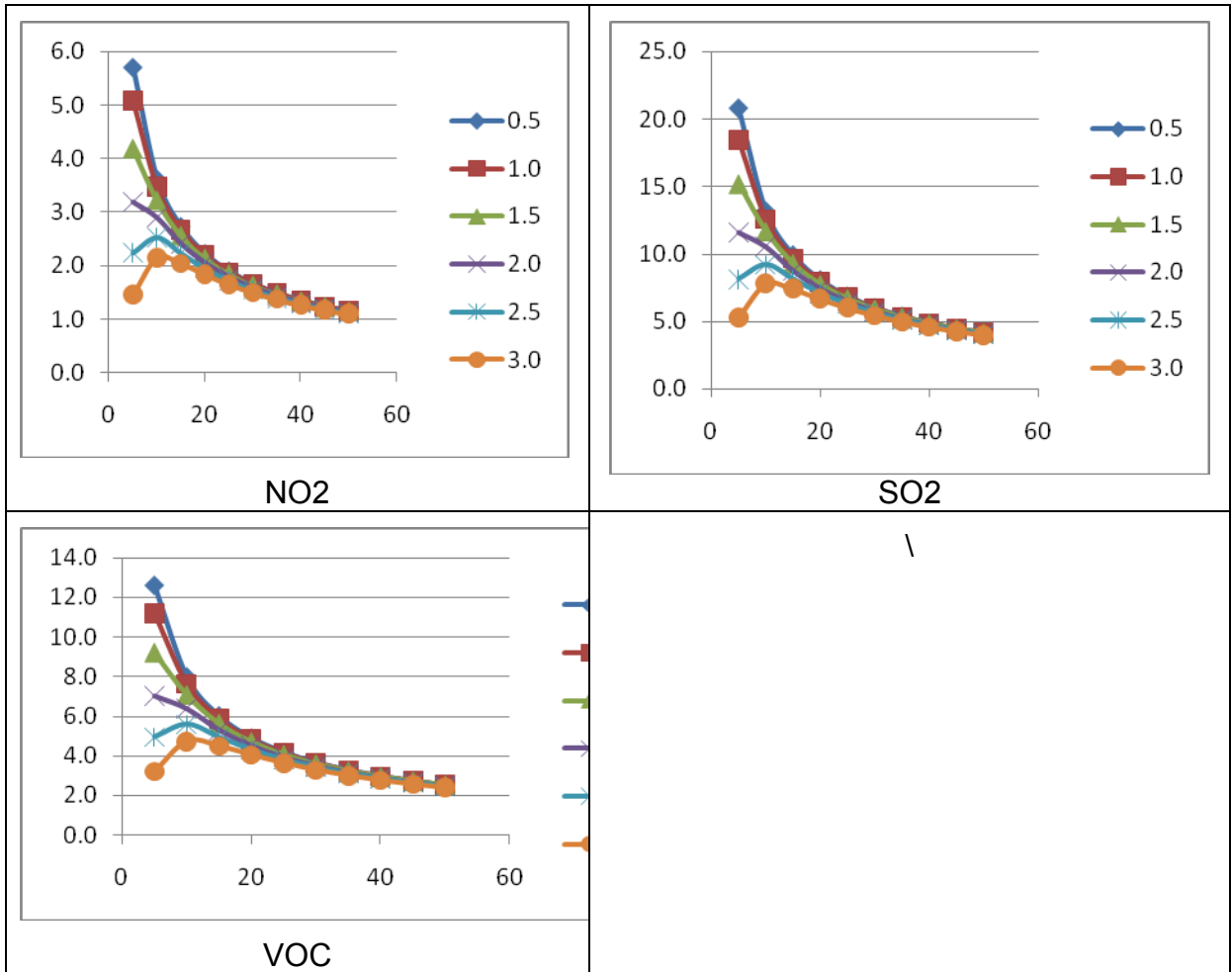


Table 22: Result for predicting dust concentration NO2 (mg/m3)

Distance x (m)	Elevation z (m)					
	0.5	1	1.5	2	2.5	3
5	5.711	5.083	4.184	3.186	2.242	1.459
10	3.623	3.464	3.215	2.895	2.530	2.147
15	2.731	2.664	2.554	2.408	2.233	2.036
20	2.227	2.190	2.130	2.049	1.949	1.834
25	1.898	1.875	1.838	1.787	1.724	1.649
30	1.665	1.649	1.624	1.589	1.546	1.494
35	1.489	1.478	1.460	1.435	1.404	1.366
40	1.352	1.344	1.330	1.312	1.288	1.259
45	1.242	1.235	1.225	1.210	1.192	1.169
50	1.150	1.145	1.137	1.125	1.110	1.093

Table 23: Result for predicting dust concentration SO2 (mg/m3)

Distance x (m)	Elevation z (m)					
	0.5	1	1.5	2	2.5	3
5	20.764	18.478	15.212	11.582	8.153	5.304
10	13.172	12.594	11.687	10.525	9.200	7.804
15	9.930	9.683	9.286	8.756	8.119	7.403
20	8.096	7.962	7.745	7.450	7.087	6.668
25	6.900	6.818	6.682	6.497	6.266	5.995
30	6.052	5.996	5.904	5.778	5.620	5.433
35	5.414	5.374	5.309	5.218	5.103	4.967
40	4.916	4.886	4.837	4.768	4.682	4.579
45	4.514	4.491	4.452	4.399	4.332	4.251
50	4.182	4.163	4.133	4.090	4.037	3.972

Table 24: Result for predicting dust concentration VOC (mg/m3)

Distance x (m)	Elevation z (m)					
	0.5	1	1.5	2	2.5	3
5	12.584	11.199	9.220	7.019	4.941	3.214
10	7.983	7.633	7.083	6.379	5.576	4.730
15	6.018	5.869	5.628	5.307	4.921	4.487
20	4.907	4.826	4.694	4.515	4.295	4.041
25	4.182	4.132	4.050	3.937	3.798	3.633

30	3.668	3.634	3.578	3.502	3.406	3.292
35	3.281	3.257	3.217	3.162	3.093	3.010
40	2.979	2.961	2.931	2.890	2.838	2.775
45	2.736	2.722	2.698	2.666	2.625	2.577
50	2.534	2.523	2.505	2.479	2.447	2.407

Table 25: Limited Value of pollutants Concentration

Dust, air Emission	Unit	QCVN 05:2009/BTNMT
Dust	(mg/m ³)	0.3
CO	(mg/m ³)	30
NO ₂	(mg/m ³)	0.2
SO ₂	(mg/m ³)	0.35
VOC	(mg/m ³)	-

Comparison of dust concentrations and emissions from the materials transportation with NTR 05:2008 / MONRE, predicted concentration of air pollutants on transportation routes will be higher several times. In fact, impacts of dust and emissions on air environment, affecting to the local community is unavoidable. But, the transportation will take place on a large scale, dust and emissions will be dispersed to reduce pollution levels. However, this impact is assessed at high level, construction contractors need to pay attention specially to the issue.

Impact assessment for materials causing air pollution

Table 26: Impact of material causing air pollution

Pollutants	Impact
Dust	- Stimulate respiration, pulmonary fibrosis, lung cancer - Injury to the skin, corneas, eyes, digestive diseases
SO _x , NO _x	- Influence the respiratory system, disperse on blood - SO ₂ can poison through the skin, reducing alkaline reserve in blood - Create acid rain affecting to the growth of vegetation and crops - Strengthen the process of metal corrosion, concrete material and buildings destruction - Bad influence on climate, ecosystems and the ositelayer
CO	- Reduce ability of oxygen transportation of blood to the organizations, cells by combining with hemoglobin and CO into cacboxyhemoglobin
CO ₂	- Cause respiratory lung disorder - Cause the greenhouse effect - Impact on ecosystem

3.3.2.2. Noise Pollution

During the construction phase for resettlement site, noise sources as follow:

- + Materials transportation activities
 - + Infrastructure construction activity in the resettlement sites
- + Digging, embanking
- + Construction equipment

According to VS 5949:1998, the biggest noise level is 85dBA for production area and the lowest noise level is 40dBA at health centers, libraries, nursing homes, schools from 10PM to 6 AM. For residential areas, allowed maximum noise level does not exceed 75dBA. Noise from construction machines, equipment, vehicles are presented in Table 27 below

Table 27: Noise from construction equipment with a distance of 1.5m

Equipment	Noise level (1.5m) (dBA)
Truck	70-96
Excavator	72 - 96
Compaction machines	72 - 88
Tractor	73 - 96
Bulldozer	77 - 95
Concrete mixer	71 - 90
Electric Generator	70 - 82
Vibrator	70 - 80

However, the noise level will decrease as the effect distance and can be estimated by the formula:

$$L_p = L_p(X_0) + 20\log_{10}(X_0/X)$$

of which:

- $L_p(X_0)$ noise level at 1.5m distance from source (dBA)
- $X_0 = 1.5m$
- $L_p(X)$: noise level at the position calculation (dBA)
- X : The calculated position (m)

Thus the maximum noise level with distance from the operation of construction equipment are presented in Table 28 below.

Table 28: Maximum noise level with distance

Mechinery, Equipment	Lp (X0) (dBA)	Lp (50) (dBA)		Lp (100) (dBA)		Lp (2100) (dBA)	
		Min	Max	Min	Max	Min	Max
truck	70 - 96	39.5	65.5	33.5	59.5	27.5	53.5
Excavator	72 - 96	41.5	65.5	35.5	59.5	29.5	53.5
Compaction machines	72 - 88	41.5	57.5	35.5	51.5	29.5	45.5
Tractor	73 - 96	42.5	65.5	36.5	59.5	30.5	53.5
Bulldozer	77 - 95	46.5	64.5	40.5	58.5	34.5	52.5
Concrete mixer	71 - 90	40.5	59.5	34.5	53.5	28.5	47.5
Electric Generator	70 - 82	39.5	51.5	33.5	45.5	27.5	39.5
Vibrator	70 - 80	39.5	49.5	33.5	43.5	27.5	37.5
RS 5949:1998 (6-18h)		60dBA					

Thus, the noise level from operation of construction equipment on site as shown in Table 28, the maximum noise level from trucks, excavators, tractors and bulldozers were at a distance of 50 meters beyond the permission limit from Vietnam Standard Organization (TCVN). Also the noise levels of equipment are within the permissible limits of the ISO. Those affected by the noise of machinery operating in the construction sector investors will be closely managed from recruiting contractors so the noise impact is not large. (detail about noise mitigation method is shown in chapter 4)

3.3.2.3. Impact on water quality

a. Pollution from domestic wastewater

Wastewater of workers is also a significant pollution source to surface water quality in the project area during construction. According to total quantity of every resettlement site, estimated average workers are 40 people per resettlement site. So total workers mobilized are 480 people in 12 resettlement sites. With average 150l/person/day, the total volume of domestic wastewater in construction phase is estimated about 57.6m³ /day (80% of supply water total). With this amount of waste water without treatment will impact directly on the environment of surface water and underground water. Domestic wastewater contains mainly residues of substances, suspended solids, organic compounds (COD and BOD) and nutrients (N, P) and microorganism. Based on statistical calculations of many developing

countries, loads and concentrations of pollutants release into the environment every day per person (if untreated) is shown in table 29.

Table 29: Load of pollutants per day

<i>Polluted criteria</i>	<i>value (g/person/day)</i>	<i>Microorganism (MPN/100ml)</i>	<i>Load (kg/day)</i>
BOD5	45 – 54	-	21.6-25.92
COD	72 - 102	-	34.56-48.96
TSS	70 - 145	-	33.6-69.6
Total N	6 - 12	-	2.88-5.76
Amoni	2.4 – 4.8	-	1.152-2.304
Total P	0.8 – 4.0	-	0.384-1.92
Total Coliform	-	$10^6 - 10^9$	$5.76 \cdot 10^8 - 5.76 \cdot 10^{11}$
Feacal	-	$10^5 - 10^6$	$5.76 \cdot 10^7 - 5.76 \cdot 10^8$
Worm	-	10^3	$5.76 \cdot 10^5$

The concentration of pollutants in domestic wastewater are calculated based on pollution load, flow of wastewater and processing effect of septic tank (3 compartments), the results are presented in Table 3.16

Table 3.16 Concentrations of pollutants in domestic wastewater in construction phase

No	Pollutants	Concentration (mg/l)		
		Untreated	Treated by septic tank	NTR 14-2008 (level B)
1	BOD ₅	375 – 450	150 - 180	50
2	COD	600 – 850	240 - 340	-
3	TSS	583 – 1208	233 - 483	100
4	Total N	50 – 100	20 - 40	10
5	Amoni	20 – 40	8 - 16	-
6	Total P	66.7 – 333.3	26.6 - 133	6

Compared with regulation 14:2008 / MONRE, concentration of pollutants in the waste water exceed the allowed limit within 2-5 times. If there are not measures to collect and process, it will cause a major impact on the environment and human health. High TSS concentration in sewage increases turbidity of received basin, affects aquatic organism's movement and searching for food. At the same time, high turbidity also restricts received sunshine to deeper layer ability of water, decreases photosynthesis ability of plants and algae in deeper layer. High BOD₅ concentration in sewage decreases dissolved oxygen in water because of organic decomposition process. At once, this also facilitates the development of algae on surface water and can create eutrophication. Besides,

appearance of large numbers of Coli bacteria and kind of intestinal bacteria in water can intrude into food resources such as vegetable, bulb, fruit when was watered or washed by polluted water by this bacteria, thence intrudes into human body and causes dangerous epidemic disease such as acute diarrhea, cholera

b. Wastewater from equipment and machinery

Concrete mixing,, cleaning and maintenance for machine will generate waste water, estimated 0.3 m³/day/1 resettlement site, which not much. Total volume of waste water from cleaning about 3.6 m³/day. The pollutant contents in wastewater generated from the construction site is mainly suspended solids which is not toxic, So, the ability of waste penetrating into water environment is low. During construction phase, equipment cleaning may introduce an amount of oil into the water. The chance that oil and grease from construction plants leaks into canals, ponds and lakes is high.

Average quantity of oil is used is 18 liters / once each vehicle. Total of average oil change times is 4 times/year each vehicle. Estimated for a day, there are 120 cars (each resettlement site has 10 cars), annually is 8640 liters of waste oil. However, trucks mainly transport in one and half year (leveling a road surface time, building road – bed time). Even so, if this quantity of lubricant is not collected, treated, it will pollute sufficiently with surface water and underground in this area:

- Reducing carrying capacity of canals, ditches, ponds, lakes, rivers, by organisms and bottom organisms killed by the oil.
- To impede the process of making space for water surface, due to dropping oil and dissolved oxygen in water will not be added.

c. Stormwater runoff

To assess the impact of stormwater runoff in resettlement sites for the surrounding environment, such reports are based on the surface area (374,812.0 m²) and annual average rainfall of the project area (1808mm = 1.808m). Thus, the total amount of water runoff on the project area:

$$Q = F \times W = 374,812.0 \times 1.808 = 677,660 \text{ m}^3/\text{year}$$

So stormwater runoff through the construction area, mining areas of construction materials, rock waste area, waste dump is great, flow with materials, the loose soil, mineral on the surface, leaking oil, ... increase suspended material content, organic matter,

turbidity, oil and water environment caused adverse impacts on aquatic ecosystems of received water source. Building contractor should conduct cleaning on construction site, covering materials to minimize the impact of stormwater runoff on construction site.

3.3.2.4. Impacts on soil quality

The formation and construction of resettlement sites firstly change land use purpose of the project area, destruct vegetation in the project area by clearing, digging, embanking, leveling activities. Activity of construction equipment and machine; gathering, storing fuel, materials and activities of workers will generate waste materials to soil environment such as sewage, solid waste, raw materials, leaking oil ...

The impact of the project to the soil environment is considered negligible due to:

- + Land use efficient is significantly increased, improving urban infrastructure, gradually improved the quality of people's life.
- + Wastes, wastewater, inflammable ... on the contraction site were collected, thus limiting sources of pollution to the soil environment.
- + Moreover, the resettlement areas are mainly agricultural land, so that after constructing the resettlement area will limit the amount of chemical plant protection penetrating into the soil.

3.3.2.5. Construction Solid Waste

During construction, solid wastes including cement, bricks, sand, stone, wood and scrap materials ... or the concentration of workers generates domestic waste in construction site. This waste generally contains many kinds of organic material, easy decomposition (except package, nylon).

- Solid waste pollution is from materials transportation activities.

The cause of arising solid waste in building process including: excavation and levelling activity, leveling a surface road, transporting raw material and gravelly soil waste activity; building activity; maintaining vehicle and machine activity and so on; solid waste including: gravelly soil, dug and covered, scattered sand. Moreover, there is different solid waste such as: iron and steel trifle; kinds of cement cover; wood trifle, brick break.

If covering carefully with body truck method in transporting building raw material, solid waste will be scattered. This solid waste can discharge directly or indirectly in pond,

different drainage trench along transport road, cause surface water pollution (mainly increasing turbidity of water). In addition, after building process, arising a kind of solid waste such as brick trifle, iron and steel trifle, cement cover. However, this solid waste is reused so gather all to utilize or sell for unit having demand. So these kinds of solid waste rarely discharge in environment

Assuming that amount of dropping sand, soil in the process of transportation is estimated 0.5% per of total, there are about 3.6 m³ of soils in total of 721 m³ of rock,soils dropped every day on a large area, Major of this land used to leveling, so that spillage of soils is mainly in the construction of resettlement sites so the impact of this waste is minor for environment.

Waste soil, typically mud (gained 5 percentages of total dug and banked soil) dredged from the bottom of canal, pond, ditch is not suitable with leveling background. This soil should be reused at crop land or parks were suitable, leveling of low land areas or ultimately disposed of in city's existing landfills such as Trang Cat, Thuong Ly, Dinh Vu.

3.3,2,6. Solid Waste from Workers' camps

Main solid waste are package, plastic bags, bottles, cans, wood, paper, plastic ... According to estimates, the average amount of solid waste of one person per day is 0.5kg. Thus, the total amount of domestic waste per day is $480 \times 0.5 \text{ kg / person / day} = 240 \text{ kg / day}$.

This is a major source of pollution due to the decomposition of organic matter, odor, waste water and microbial pathogens. This source will pollute seriously to soil, water and air unless they are collected. Percentage of component in domestic waste in table 30.

Table 30: Percentage of component in domestic waste

No	Waste component	Weight (%)
1	Organic mater	50.35
2	Paper , cover	2.74
3	wood, plastic, rubber, leather	7.10
4	Shell, snail cover...	1.00
5	glass	7.73
6	gravel, brick	7.46
7	Metal	1.00
8	Mixed solid <10mm	22.62

With the percentage of the components, the load of domestic waste by the components in a day in the resettlement sites are shown in table 31.

Table 31: Load of pollutant in domestic waste

No	Waste component	Weight (kg/person)
1	Organic mater	120.84
2	Paper , cover	6.58
3	wood, plastic, rubber, leather	17.04
4	Shell, snail cover...	2.40
5	Glass	18.55
6	gravel, brick	17.90
7	Metal	2.40
8	Mixed solid <10mm	54.29
	Total	240.00

Although the volume of domestic solid waste is not much but if there are no measures to collect appropriately, capability to accumulate during construction more and more impacts on air quality by decomposing organic waste as well as the impact on surface water by increasing turbidity, preventing the flow, causing sedimentation. Besides, enabling the microorganisms causing disease to develop, risk from spreading of germs that affect to the health of workers and further to the residential areas. So the number of waste will be collected periodically by the investor.

3.3.2.7. Hazardous materials and wastes

Hazardous materials and waste generated during construction is mainly sticky oil cloth during operation of machines and construction equipment. However, the volume is minor,

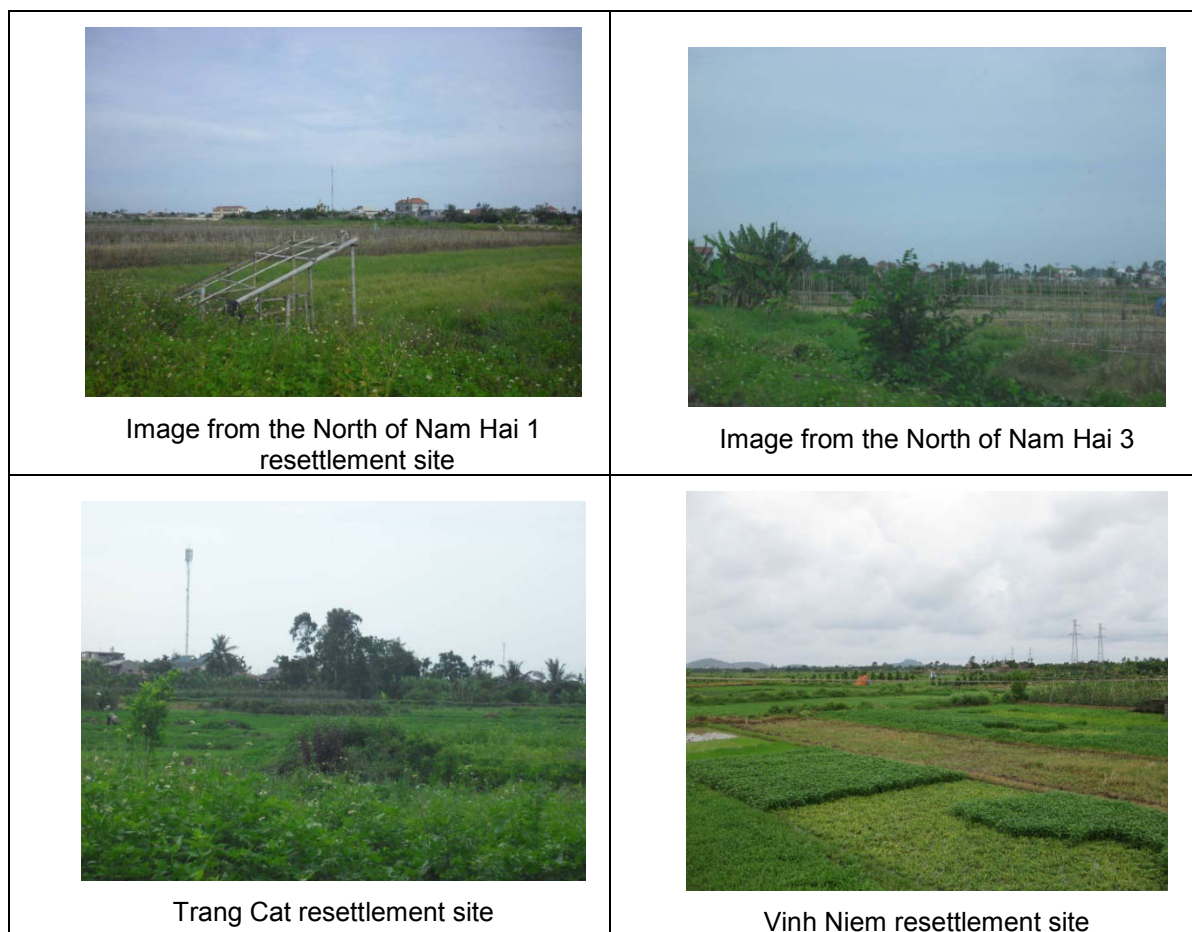
negligible. These kinds of solid waste are ranked as hazardous waste according to decision No 23/2006/QĐ – BTNMT dated December 26th 2006 of Resource and Environment Ministry. The contractor to place the container in the project area for collection of waste and hire Hai Phong Urban Environment Company to collect and treat them.

3.3.2.8. Impact on ecosystems

a. Terrestrial ecosystems

In twelve resettlement sites of project, agriculture land makes up 97.1% total area. Ecosystem in this area mainly is wet rice ecosystem, moreover, water morning glory, little eucalyptus, banana and different plants are commonly seen at the resettlement sites and has low biological values. In general, vegetation in this area of project area is poor, and there are no known endangered species, animals in resettlement site. Hence, terrestrial ecosystem of project area is not affected much by project activities

Figure 12: Photos of project resettlement sites



b. Aquatic ecosystems

The process of clearance and technique infrastructure construction technique will change the living environment of aquatic animals. Lakes, ponds, ditches will be leveled. However, pond area occupies 0.8% total using area, moreover, these are mainly planting water morning glory pond. So the water ecosystem in the region is also relatively poor, the common aquatic ecosystems are: dirt, moss, fish, crabs, snails so the project's activities do not change much on aquatic ecosystems in the region.

3.3.2.9 . Impact on economic - social environment

a. Affect to the health and lives of workers and residents in the project area

- Impacts by dust and emissions: dust, emissions impact on respiratory affecting to health of workers on construction site.
- Impacts from noise: noise affects directly the health of workers, causing the diseases related to hearing.
- Impact by worker: Worker on construction site can carry strange diseases and spread to other people's communes in the project area. Health care needs of workers pressures to the local health facilities for medical equipment, medicines, medical staff, health care work.
- Impacts by construction: labor accidents may occur during construction if the workers do not comply with all regulations of labor safety. These may include accidents such as traffic accidents, accidents in the process of building project items, electrical accidents...
- Impacts by environmental incidents: Incidents caused by fire, explosion can be dangerous to human life, affecting to items and construction progress.

Consequently, project owner and entrepreneur together sign a contract with Hai Phong urban environment company to collect and convey this waste to Trang Cat, Thuong Ly, Dinh Vu rubbish dump.

b. Affect to the security, culture, customs and habits of local people in the project area

- Impact on security and the management of local authorities when workers in the resettlement site caused conflicts with groups of people (workers with workers, workers with local people); generate social evils (drug use, prostitution, trafficking animals illegal , ...), change population in the project area.
- Impact on culture, customs of local people.

c. Impact on economy of local people

Concentration of workers makes increased demand for food, entertainment activities in local, contributes to promoting development of trade and services. The business service will be established to satisfy the needs of life and activities of workers, this contributes to solve job problem and increase income for local people.

d. Affect to the cultural and spiritual life of people

The project area is located near the cemetery of the local people, so the project violated the tomb must have been minimized. But the tomb removal of some households is unavoidable. This also partly affect the spiritual life of families to relocate graves. However, this level of impact is assessed at low levels, the project owner, the contractor will conduct the campaign of ideas and support people in moving graves.

e. Affect to psychological, daily life of a affected directly residential group

Most people will benefit from the project and expressed support for the project. However, there are approximately 1000 households located in areas affected by the project fall worried by the impact of the project. The activities of everyday life will be changed so people need to get the correct information on the progress of the project, plan the construction of works...

3.3.2.10 Labor accidents

In general, the labor accidents incident can occur suddenly in situations in construction phase. Construction workers shall be object to the risks of labor accidents at construction sites. Working near the big load of machinery, electrical lines, the cranes... causing dangerous. The occurrence level and frequency of occupational of accidents would be even higher if the regulations on labor safety is not done, the construction vehicles are not maintained regularly or workers are not trained measures to ensure labour safety. Some types of labor accidents can be summarized as follows:

- Construction, materials transportation process with traffic density, noise, vibration can cause high labor accidents...
- Due to carelessness in work, lack of labor protection equipment, or lack of awareness about compliance with strict regulations on labor safety of workers also regrettable accident;

Thus, if the risks of labor accidents occur will greatly influence on health and life of workers, causing enormous losses for mental. Therefore, safety issues for workers are cared by the project owner and contractor, need to have measures to prevent.

3.3.3 Impact during operation phase

3.3.3.1 Changes in Land Use

Land use in the resettlement sites will be changed from largely agricultural to urban residential land as indicated in the table 32 below

Table 32: Planned Land use in the resettlement sites

District/ Commune	Total area (ha)	Use Land type				
		Numbers of households	Residenti al (ha)	Public land (ha)	Park (ha)	Roads (ha)
An Duong	15.2	542				
Bac Son	3.88	168	1.56	0.25	0.43	1.65
Le Loi	2.00	59	0.73	0.17	0.22	0.88
Dang Cuong	8.15	269	3.29	0.49	0.45	3.93
Hong Thai	1.21	46	0.57	0.00	0.02	0.62
Kien An	4.52	244				
Dong Hoa 1	2.57	113	0.92	0.20	0.10	1.36
Dong Hoa 2	1.95	131	0.93	0.00	0.05	0.98
Le Chan	1.90	116	0.69	0.09	0.09	1.04
Vinh Niem	1.90	116	0.69	0.09	0.09	1.04
Hai An	14.88	874				
Dang Hai	3.01	196	1.20	0.44	0.16	1.21
Nam Hai 1	1.76	116	0.93	0.00	0.00	0.84
Nam Hai 2	2.21	145	0.94	0.00	0.07	1.20
Nam Hai 3	2.31	117	0.72	1.03	0.15	0.41
Trang Cat	5.59	300	1.51	0.88	0.23	2.97
Total	36.54^(*)	1776	14.00	3.54	1.96	17.10

Note: ^(*) Land area is planned in the resettlement sites

Demographic movement will cause increased pressure on infrastructure, electricity and water supply, education, health care

After the resettlement is completed, expected about 8500 people gathered in the resettlement sites, the densely population will require infrastructure in the resettlement

sites should be improved. This is a great pressure to electrical infrastructure, water, education and health, but this pressure is not large because of:

The project of power supply infrastructure, roads, water supply systems, wastewater drainage system (rain water + waste water) completed synchronously.

The resettlement households include households whose land is recovered by the construction of resettlement sites and the roads. However, the resettlement sites are located at the same affected commune so that the mobility of resettled households mainly occurred in that commune/ward. On the other hand, education and health infrastructure now of the commune to meet the current requires of the people, so the pressure has been assessed as not significant.

Microclimate variations

Changes of land surface from largely agriculture land with vegetation cover to residential land with largely impermeable surfaces may cause increased localized evapo-transpiration capacity, temperature as well as other microclimate features during operation phase. This potential impacts has been considered and included in the layout design of resettlement areas.

Changes in land surfaces will also lead to localized changes to natural drainage pattern and capacity. This issue will be addressed through the design of road and drainage systems for resettlement areas.

3.3.4 Accidents and Environmental Hazard risks

3.3.4.1 *The risk of fire, electricity*

Fire incidents that may occur during construction of infrastructure works that cause may be from:

- The temporary storage of materials services for machinery, technical equipment in the construction process (paint, oil, fuel...) is the source of causing fire. When problems occur that can cause serious damage to the human, material and surrounding environment;
- Temporary power supply system for machinery, construction equipment may be the cause of the incidents, causing major economic damage, even can cause labor accidents;

- The use of heating equipment in construction (welding, heat ...) can cause fires, burns or labor accidents without the awareness and preventive measures promptly;
- The fire careless use workers (smoking, cooking ...) can cause fires and cause very serious consequences to people and property.

Generally, fire incidents rarely occur in the construction process in the resettlement. But if this incident occurred will cause great influence to people, property and environment. Therefore, it needs to comply with strict safety regulations for employees and works.

3.3.4.2 Traffic accidents

Because the transportation activities on construction site with relative high flow, materials transportation from quarry to construction sites through the residential area. the project area has the dyke road, inter-communal road and the complex traffic components so traffic accidents incident can occur if no measures for good management. However, ability of occurred accident incident is minor because rate of car is low and the roads of resettlement site is designed and planned suitably.

3.3.4.3 Impact of localised flooding

In the course of construction of resettlement areas if heavy rains occur, the vegetation, irrigation systems are destroyed, drainage system in the resettlement areas are not complete, may lead to flooding structure plan areas, affecting the construction schedule.

Moreover, the resettlement areas are lowlands, where the concentration of the drainage area. Therefore, after the resettlement areas are leveling at an elevation of +4.2 m (higher than some surrounding areas) leading to a rainfall not be able to drain, causing flooding of vicinity areas.

3.3.5. Site-specific issues

During the deploying process of leveling space and building infrastructure, effects by the project in natural and social environment in every resettlement were analyzed:

3.3.5.1 Resettlement site in Bac Son commune

Machines, equipment and building materials will be transported to the site from National Highway No. 10 through an existing rural road of 3.5 m located in the northern border of the resettlement site. Movement of such heavy construction plants and heavy materials affect concrete inter-commune traffic system, damage this road. Increased risks on traffic

safety and disturbance to normal traffic flow in this rural area are also major issues during construction phase of this resettlement site. Noise and dust will also affect about 20 households located along the access road to the resettlement site. Similarly, Ha Nam culture house is located at a corner of the road where construction plants will pass by will also be affected by dust and noise. Disturbance to traffic and traffic safety would also be the issues of concerns for people accessing the cultural house.

Destroy irrigation canal existed in this site, leading to temporary flood when it's rainy in building process

Near the resettlement site, there are two small burial-ground in the South and West South, although the building does not affect on this area, however it has influence on psychology, belief of households who have graves in these burial-ground

Near the resettlement site, there are 3 inhabitant areas in the South, East

North and North. These areas are affected by dust, exhausted gas, sanitation of the project. In 3 inhabitant areas, East North is the biggest effect because of near the resettlement site.



Culture house outside resettlement site, possibly affected by building work with noise, dust, visual impacts

3.3.5.2 Resettlement site in Le Loi commune

Machines, equipment and building materials will be transported to the site through Highway No. 208 of 7.5 m located in the southern border of the resettlement site. Movement of such heavy construction plants and heavy materials affect concrete inter-commune traffic system, damage this road, increased risks on traffic safety. Moreover, noise, exhaust and dust will also affect about 30 households located along the access road to the resettlement site.

Similarly, Le Loi primary school and junior high school in the south of the resettlement site will also be affected by dust, exhaust and noise due to construction activities. When going to school or after school, on route 208, there will be able of traffic accidents for the two students this school.

Destroying approximately 215m irrigation channel in the proposed resettlement areas leads to temporary flooding due to rain during the construction process.

Nearly resettlement site, there are 02 small graves in the northwest. Although the construction does not affect access to this area, however this problem affects the psychological, the confidence of the family that have graves here.

The residents living along the road (Road 208 - South of resettlement site) will be affected by dust, exhaust, noise and environmental sanitation due to machines, equipment and building materials transportation.

3.3.5.3. Resettlement site in Dang Cuong commune

The project will destroy approximately 329m irrigation channel, 1060m² pond area in the proposed resettlement areas, which leads to temporary flooding due to rain during the construction process.

In resettlement areas, there are about 05 graves in the south, the grave will be moved to the nearby cemetery. This problem affects the psychological, the confidence of the family that have graves to be moved.

Machines, equipment and building materials will be transported to the site from along the northern highway of 7.0 m. Movement of such heavy construction plants and heavy materials affect concrete inter-commune traffic system, damage this road, increased risks on traffic safety. Furthermore, along the roads, there is An Kim Hai channel, when transporting the materials will be able to drop the materials down the drain, causing water pollution.

In the northern resettlement areas, there is 35KV power line system, where potential electrical problems when contractors use cranes too high. However, pylons have not to be moved.

Nearly resettlement, residential areas in the Northeast will be affected by dust, exhaust, noise and environmental sanitation during the construction.

3.3.5.4 Resettlement site in Hong Thai commune

Construction of the proposed resettlement area will be aggraded an area of aquaculture ponds in the south. Furthermore, the process of aggrading and construction will affect the aquatic environmental quality of aquaculture ponds and western canal of resettlement area due to dust, soil, water waste and sanitation.

In the northern resettlement area, there is 110KV power line system, where potential electrical problems when contractors use cranes too high. However, pylons have not to be moved.

Nearly resettlement area, there are an embankment to the resettlement of about 100 meters south, the contractors might use this route to transport machines, equipment and building materials to the resettlement area causing embankment corruption.

3.3.5.5 Resettlement site in Vinh Niem ward

The project will destroy the irrigation canals, vegetables ponds in the proposed resettlement area, which leads to temporary flooding due to rain during the construction process.

In the proposed resettlement area, there will be 05 households to be relocated (northwest resettlement area), which affects life, living habits of the household being relocated. However, some households not being relocated will be affected by dust, exhaust, noise and sanitation due to construction activities.

3.3.5.6. resettlement site No 1 in Dong Hoa ward

Machines, equipment and building materials will be transported to the site through Highway No. 208 of 7.5 m located in the southern border of the resettlement site. Movement of such heavy construction plants and heavy materials affect concrete inter-commune traffic system; damage this road, increased risks on traffic safety. Moreover, noise, exhaust and dust will also affect about 10 households located along the access road to the resettlement area.

Also, the Children hospital location adjacent to the resettlement area in the north also will be affected by dust, exhaust and noise due to construction activities, affecting the examination and treatment of doctors and patients in hospitals.

Destroying approximately 150m irrigation channel in the proposed resettlement area leads to temporary flooding due to rain during the construction process.

In the northern resettlement areas, there is 220KV power line system, where potential electrical problems when contractors use cranes too high. However, pylons have not to be moved.

Nearly resettlement, there are the Bach Nghe College in the north, the An Duong technical workers in the east, and the residential areas in the west and south. These areas will be

affected by dust, exhaust, noise and sanitation. Particularly, the residential areas in the west will be affected most because of the nearest distance.

3.3.5.7 resettlement site No. 02 in Dong Hoa ward

Machines, equipments and building materials will be transported to the resettlement site through the concreted road of 2 m located in the Southern of the resettlement site and an asphalted road of 5m located in the East of the resettlement site. The material transportation will damage road route and affect on traffic in the area.

Irrigational system in the proposed resettlement area is destroyed and 780m² of growing vegetable pond area which is filled, affected on the drainage system in the area, causing temporarily flood during construction process.

Moreover, the material transportation process will impact on dust, emissions, noise and environmental hygiene to a residential unit in the west and Southern West of the resettlement area.

3.3.5.8. Resettlement site in Dang Hai ward

Machines, equipments and building materials will be transported to the resettlement site from Ngo Gia Tu street through an asphalted road (northern resettlement areas) of 5.0 m. The vehicles with big tonnage which transport materials construction, will damage road route and affect on traffic in the area. Furthermore, noise and dust, emissions from this vehicles will affect on 30 households located along road route to resettlement area.

1119 m² of growing vegetable pond area which is leveled, caused temporarily flood during construction process.

There are residential areas near-by resettlement site, in the South, North, West and Southwest has military barracks which is affected so much by the nearest distance.

3.3.5.9. Nam Hai No.1 Resettlement site in Nam Hai ward

Machines, equipments and building materials will be transported to the resettlement site from Ngo Gia Tu street through an asphalted road (Northern resettlement) of 5.0 m. The vehicles with big tonnage which transport materials construction, will damage road route and affect on traffic in the area.

Northern resettlement areas have a water ditch. Although subproject won't affect on the land area of ditch, but in the process of leveling, transporting of materials and construction

process can affect on the water environmental quality due to dust, waste, waste water enters the ditch.

3.3.5.10. Nam Hai No.2 Resettlement site in Nam Hai ward

The mainly impacts in the resettlement area such as: Hai An high school in the south of resettlement will also affected by dust, exhaust fumes and noise due to constructional activities and it will affect on learning of students.

Machines, equipments and building materials will be transported to the resettlement site from Ngo Gia Tu street through an asphalted road (Northern resettlement) of 5.0 m. The vehicles with big tonnage which transport materials construction, will damage road route and affect on traffic in the area.

There is a 22KV powerline runs along the southern border of the RS.

3.3.5.11. Nam Hai No.3 Resettlement site in Nam Hai ward

Irrigational system in the proposed resettlement area is destroyed. These will cause temporarily flood during construction process.

Machines, equipments and building materials will be transported to the resettlement through approach road of 4.0 m in the East resettlement area. The vehicles with big tonnage transport materials construction will damage road route.

At West of resettlement areas have a irrigation ditch. Although subproject won't affect on the land area of ditch, but in the process of leveling, transporting of materials and construction process can affect on the water environmental quality due to dust, waste, waste water enters the ditch.

Near-by, in West and Southeastern, there are residential area will affected by dust, gases, noise and environmental hygiene during constructional process.

3.3.5.12. Trang Cat Resettlement site

In the proposed residential area, there is 02 households who is displaced due to the acquisition of residential land area (total 650m²). That will affect on the economic life, living habits of the relocated household. Households who are not displaced, will be affected by dust, emissions, noise, environmental hygiene due to constructional activities.

Near-by resettlement site, residential area in the Southeastern is affected by dust, emissions, noise, environmental hygiene. At southwestern of resettlement site, there is

Truc pagoda. Although, the construction don't affect on access road of Truc pagoda, but it will affect on psychological, the confidence of the family to worship there.

The existing 35 KV powerline cut through a small part in the southeastern corner of the resettlement site. That raises safety during construction and operation phase related to movement of workers, and operations of construction plants, equipment within and near this safety corridor.

General assessment about the resettling areas:

The areas are lying in the resettling area which is almost nearly the transportation route between hamlets, communes...that is very convenience in transport of material and building facilities.

Present condition in project barrier is almost agricultural lands which the population have in outside and technological infrastructure building has a little complex, so the activities of compensation to release layout to prepare the convenience of project.

The conformation is flat relatively, convenience at highway transportation, the scale of project is relevant with developing arrangement of city in order to convenience the construction of new residential area, responding the demand of housing construction and speed of urbanization in suburban site.

System of technical infrastructure on the highway is quite complete very convenient conditions for the connection of supply lines, drainage, electricity ... reduce the cost of infrastructure construction projects.

The project will erase take some inland canal system in the resettlement sites so affect the drainage system of the region, a part of which will cause local flooding during construction. Despite the time construction occurs in a short time (about 1.5 years), then infrastructure and drainage is completed, the phenomenon of inundation will not occur.

Currently in the construction of resettlement sites without garbage collection system for households. Therefore, in the process of construction, building waste as well as construction waste by workers will affect the regional environment.

CHAPTER 4. PUBLIC CONSULTATIONS AND INFORMATION DISCLOSURE

Operation policies of the World Bank on safeguard requires that affected people and interested parties in project areas should be informed and consulted during the preparation of environmental impacts assessment..

Community consultation on environmental impacts assessment for the resettlement sites of the Hai Phong Urban Transport Development Project started on 28 June 2010 and completed on July 20th 2010. Information related to this consultation process is summarized in Tables 33 and 34

Table 33: Activities Carried out in Consultation Process

Date	Consulted groups	Content	Approach	Result
From June 28 th 2010 to July 2 nd 2010	<ul style="list-style-type: none"> + Dong Thai and Vinh Niem local authorities + Representatives of local organisation, citizen group + 30 percentages of people affected in Dong Thai and Vinh Niem 	<ul style="list-style-type: none"> + Introduce about the project: target, design, policy, support, time schedule. + Potential Impacts during the project implementation and mitigation measures + Recording opinions of local community 	<ul style="list-style-type: none"> + Consulting took place at cultural house or, People's committee office,. + Interviewing directly, survey form, asking 	<ul style="list-style-type: none"> + affected people and interested parties were informed about the project + opinions of local community about environment impacts and adverse impacts minimized measures raised and recorded.
3rd: From July 12th 2010 to July 16th 2010	<ul style="list-style-type: none"> + Consulting Bac Son, Le Loi, Dang Cuong, Hong Thai, Dong Hoa, Dang Hai, Nam Hai and Trang Cat local administration + Represent local organisation, citizen groups + 30 percentages of people affected in resettlement area. 	<ul style="list-style-type: none"> + Introducing content of project: target, design, policy, support, progress of project. + Introducing possible effect during the project and adverse impacts minimized measures + Accepting opinions of local community 	<ul style="list-style-type: none"> + Consulting took place at cultural house or, People's committee office,. + Interviewing directly, survey form, asking 	<ul style="list-style-type: none"> + affected people and interested parties were informed about the project + opinions of local community about environment impacts and adverse impacts minimized measures raised and recorded.

Table 34: Time, Location consulting community

Order	District	Commune/ Precinct	Time	Location	Numbers of household consulted
1	An Duong	Bac Son commune	8.30 am July 12th 2010	Bac Son commune house of Culture	44
		Le Loi commune	9 am July 13th 2010	Le Loi commune house of Culture	30
		Dang Cuong commune	2 pm July 13th 2010	Dang Cuong commune house of Culture	60
		Hong Thai commune	8.45 am July 14th 2010	Hong Thai commune house of Culture	36
		Dong Thai commune	9 am June 30th 2010	Dong Thai commune house of Culture	38
2	Kien An	Dong Hoa precinct	2 pm July 14th 2010	Dong Hoa precinct house of Culture	48
3	Le Chan	Vinh Niem precinct	2.30 pm June 29th 2010	Hall of Vinh Niem precinct	30
4	Hai An	Đang Hai precinct	8.30 am July 15th 2010	Lung Dong house of Culture	27
		Nam Hai precinct	2.30 pm July 15th 2010	Nam Hai precinct house of Culture	70
		Trang Cat precinct	8.30 am July 16th 2010	Hall of Trang Cat precinct People's committee	34
Total					414

Consulting local community meeting minutes is included in the appendix of this report.

4.1. Consultative content

At each consultation meeting, the following activities have been carried out:

- EA consultant introduced the basic information about the project, including the purpose of construction, scale of each resettlement area, the criteria to ensure the success of the project, including promote community participation and compensation policies, relocation and resettlement policies of the project.

- Consultant presented potential environmental impacts that may be generated during the construction of resettlement areas, proposed mitigation measures and environmental management plans in various stages of the project.
- Discuss with local authority and communities, to receive comments from community about generated environmental impacts, mitigation measures and environmental management plans.

The opinions of local authorities, affected households are recorded.

4.2. Summary of information discussed and comments received

Based on the information provided by consultant team, most households agreed with the policy of the "Hai Phong Urban Transport Development Project", resettlement component. However, participants also suggested that during construction and operation for resettlement sites, the project owner should coordinate with the respective Commune People's Committees to ensure security, traffic safety, construction sites should be equipped enough fire equipment and regularly check chemical safety, fuels and other hazardous wastes to avoid leakage into the environment; should priorities hiring local labors for unskilled works; In the process of building, negative impacts from the project on the surrounding environment (soil, water, air) would be unavoidable. Although the impact would not be significant, mitigation measures should be implemented seriously and fully to prevent environmental pollution to minimize environmental impact and domestic activities, health of local people around the area.

Table 35: Local community 's opinions

Order	Commune /Precinct	Comments and proposal
1	Bac Son commune	<ul style="list-style-type: none"> - resettlement construction need to ensure design suitable with local conditions - Manage strictly supervise when constructing infrastructure of resettlement not to affect surrounding environment. - Reinstate irrigational systems for rice fields after the project, currently there's temporary drainage canal supplying water for agricultural production - Construction can pollute environment: when building, rubbish need to be collected, pay attention to partial flooding - Resettlement building has electric line, drainage system, verdurous area, house area ensuring life conditions. During the building, transporting materials avoid to fall down and have influence on local traffic

Order	Commune /Precinct	Comments and proposal
2	Dang Cuong commune	<ul style="list-style-type: none"> - Drainage canal system existed so if the project affect this system, must return it initial state. - Execute environmental hygiene; ensure pupils safe, exhaust fumes and waste in the permitted level - project owner can build a road to transport materials to avoid influencing on traffic infrastructure of commune; having a preventing sand approach in dry season to limit number of sand dirtying; workers need disseminated knowledge of hygiene; entrepreneur project restrict noise when transporting materials and building resettlement area for people around.
3	Dong Thai commune	<ul style="list-style-type: none"> - Entrepreneur and project owner have to minimise adverse impacts from exhaust fumes, dust, noise, environmental hygiene, rubbish problem - If possible, during the project, project owner builds / use separate road - Waste water has separate drainage canal, does not join in general canal system - In worker accommodation, notice waste water from life activity, garbage; avoid social evil from outside - Restrict the effect of black sand because black sand has salt, when it's rainy, it absorbs into soil and affects trees, farm produce. - After the project, must reinstate the site, garbage need to be collected
4	Hong Thai commune	<ul style="list-style-type: none"> - Entrepreneur and project owner limit the effect of resettlement building to environment and citizen life - project owner notify bidders to minimize impacts on small traffic road, transporting materials influenced on quality of local traffic - Local rubbish collection service is not convenience to access so project owner pays attention to collecting trash - Resettlement area has a verdurous system, suitable traffic to guarantee quality of people life - Xich Tho drainage will affect because of construction so entrepreneur and host of project notice this issue to restrict the effects
5	Le Loi commune	<ul style="list-style-type: none"> - Transporting materials time should be reasonable to avoid traffic and pupil movements - Build reasonable drainage system avoid impacts on drain system, limit flood during the building - Restrict the effect of dust, exhaust fumes, noise to people around - Restrict building activities disordering local people life, declare implementing the project plan for local citizen
6	Vinh Niem precinct	<ul style="list-style-type: none"> - Although pollutants affect less to community, entrepreneur and project owner execute rules about preventing environment. - Resettlement area affects citizen's irrigation channel, consequently project owner must give replacement irrigation channel after the project - When executing the work, entrepreneur and project owner apply minimizing noise, dust, exhaust gases methods; cover materials; do not

Order	Commune /Precinct	Comments and proposal
		overweight; use machine and tools attained environmental standard.
7	Dong Hoa precinct	<ul style="list-style-type: none"> - Project owner ensures that resettlement area has complete infrastructure system to minimize the negative influences on local people - Restrict vehicle activities in relax time of local people - Entrepreneur applies adverse impacts minimized measures presented in environmental impacts assessment report - Announce implementing plan for local people - Combine with local administration to minimize impacts on economic social environment, conflict between workers and local people
8	Dang Hai precinct	<ul style="list-style-type: none"> - Drainage system of resettlement area join in general drainage (near Ngo Gia Tu way) - Rubbish of resettlement area is collected and gathered in local rubbish ground - When building, dust, noise, exhaust fumes with East South wind will affect on local people so entrepreneur must water to limit number of dust dispersing - In local citizen there're many old people so entrepreneur and project owner arrange reasonable implementing time to limit noise - Entrepreneur and project owner especially care about drainage before building to avoid partial flood - Waste water do not flow into the field, resettlement area has reasonable waste water drainage system - Rubbish is collected clearly, local had a rubbish ground
9	Nam Hai precinct	<ul style="list-style-type: none"> - Supplying water and drainage system are cared especially; supplying water sufficiently for people, and drainage system is guaranteed that there's no flood when it's rainy - Resettlement area has verdurous system - If entrepreneur uses local roads to transport materials, he avoids damaging them. If they are damaged, entrepreneur will be repaired - Clear up the material, keep hygienic during the resettlement building - Entrepreneur and project owner apply adverse impacts on environment, local life minimized measures presented in environmental impacts assessment report
10	Trang Cat precinct	<ul style="list-style-type: none"> - Resettlement area has verdurous system, complete infrastructure, ensure life conditions for people - When implementing the work, functional governments execute rules about environment presented in environmental impacts assessment report. Environmental issue is cared best not to affect people life - If transporting materials damaged local roads, entrepreneur has responsibility and give back - Implementing area near drainage ditch so waste drainage problem does not affect much to environment - Reduce dust from transporting materials during the building; trucks

Order	Commune /Precinct	Comments and proposal
		have covers, carry right fixed load. - Implement activities at work time, avoid relax time of people around - Rubbish is collected; lay moveable rubbish basket system; increase educating more for workers; keep hygienic

4.3 Opinions of local people and authority

- The compensation and support policies will follow the resettlement policy framework approved at Decision no.130 of the People's Committee of Hai Phong city.
- Construction goal for the resettlement areas will restore the public works affected by the project. Infrastructure conditions of the resettlement will be better than the present to ensure to limit impact on local people.
- In building process, the effects of dust, noise, exhaust fumes are noticed especially. Project owner asks entrepreneur to water, cover while transporting materials and dig down the ground in order to limit number of dust. Entrepreneur uses good machines, equipments maintain periodically to limit the quantity of exhaust fumes during the building. Entrepreneur and project owner give rate of progress, implementing project time, building time to community around
- Project owner asks entrepreneur not to transport material overload; entrepreneur does not implement activities in relax time
- The project will be independent monitoring consultant unit on environment, so environmental issues, waste will be monitored and reported to PMU, Hai Phong People's Committee by monitoring consultant.
- During the entire of project construction deployment process, as well as in operation, the investor will coordinate with the People's Committees of communes to ensure security and traffic safety in the area.
- The project will coordinate with the People's Committees of communes to be priority for using local labor.
- Fire protection systems, hazardous chemicals, environmental management and monitoring works, environmental pollution mitigation measures ... The project will be done exactly as in the Environmental Impact Assessment report.

- Entrepreneur propagandizes knowledge about safe working, hygienic awareness for workers, asks workers to leave litter carelessly and clear up construction site.
- Project owner asks entrepreneur to clear up construction site, lay temporary drainage system reasonably to avoid flood on construction site

4.4 Information Disclosure Plan

- + Vietnamese version of the Environmental Impacts Assessment report for the resettlement sites will be disclosed in project area before project appraisal
- + English and Vietnamese versions of the EIA report will be disclosed at PMU Office, at Vietnamese Development Information Centre at 63 Ly Thai To street, Ha Noi and World Bank information shop before project appraisal

CHAPTER 5 – ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan comprises of the following key components:

- Mitigation measures be implemented to mitigate the project's potential negative impacts on the environment
- Institutional arrangements for the implementation of environmental responsibilities during project implementation
- Environmental monitoring and supervision plan, including environmental sampling, monitoring and reporting.
- Capacity Building Activities
- Cost estimation for the implementation of environmental mitigation plans, monitoring, supervision and capacity buildings.

As resettlement is part of the main project, the Environmental Management Plan (EMP) developed for the main project will be applied to resettlement component to a maximum extend possible but also ensuring that specific issues related to resettlement sites are covered.

5.1. Mitigation Plan

5.1.1 Mitigation Measures Incorporated into Feasibility and Issues to be Follow up during Detail Design Stages

5.1.1.1 Feasibility Study

The potential impacts relating to increased demands on resources and public services such as water and power supply, drainage, irrigation and landscape during the operation of the resettlement sites have been addressed through the proposals on:

Lay out of each resettlement site included parks for public recreational activities and microclimate regulation. A total land area of 1.96 ha of land has been designated for parks in 12 resettlement sites. Trees will also be planted on foot designated areas on foot paths.

The sources of public services such as water and power supply, connections of drainage and sewerage has been identified in accordance with the city's masterplan. Particularly, water supply for 12 resettlement sites will be sourced from the existing water treatment plants namely Vat Cach, An Duong, Cau Nguyet existing water treatment plants. Power supply will be from existing transmission lines or substations located to nearby each resettlement sites (more details see the drawings)

Concerns on safety and convenience in resettlement areas during operation phase has been responded in basic designs such as fire hydrants for fire fighting included as part of water supply system and with street lightings. Internal roads are large enough for fire trucks to access. The feasibility also recommended that design of road and traffic control systems will allow blinders to be able to cross the roads.

Drainage and sewerage preliminary designs has been proposed

Kindergartens will be built in most resettlement sites.

Planning of residential houses and public areas outside safety corridors for planned metro and power supply (construction time unknown)

5.1.1.2 Detail Engineering Design Phase

In additions the considerations listed above, there are a number of issues need to be followed up during detail design as recommended below:

Although the feasibility study included proposals on drainage and sewerage systems (which will be connected to the city's planned system proposed in the City's masterplan), detail design engineers should make sure that the impacts associated with localized flooding in the areas surrounding the resettlement sites due to changes in ground level and drainage patterns. Detail design should also take into account the fact that approximately 3000 m² of ponds will be filled in.

Where road design intersect with existing roads or where roads cutting though populated areas such as clinics, kindergartens or local markets, ensure that adequate traffic control facilities such as sign boards, traffic lights, speed limit control barriers, collection roads are included to ensure safety.

Engineering design of roads, pavements and traffic control facilities should allow accessibilities for the disabilities, particularly such as blinders and people on wheel chairs

Design of new roads ensure safety and smooth connection between resettlement areas and the main roads

Refine siting of connection points to existing water supply, drainage and power supply systems for resettlement sites allows minimal impacts on traffic on National Highway number 10, provincial highway 208 and 351 and Le Hong Phong urban road

Carry out community consultations on the design of replacement roads and canals

5.1.2 Pre- construction

Project Owner will contract an army entity to carry out mine clearance before site clearance is started.

In Dang Cuong resettlement site, where existing graves and tombs will be relocated, Project Owner coordinate with local authorities to negotiate with families, pay compensation and arrange for relocation in such a way that suit local customs. In cases where owners of such graves or tombs are unknown, Project Owner will coordinate with relevant authorities to arrange for relocation and mapping of the grave sites both before and after relocations. Copies of drawings will be kept at Commune People's Office by Social Affairs Officer.

Project Owner conduct consultation with local community and authorities on temporary disposal sites of top soils and its usage

5.1.3 Construction

5.1.3.1. General Site Management

The contractor will be responsible to:

Make sure that construction activities takes place within designated areas. Minimise temporarily occupied areas.

Install and maintained fences to restrict access to the sites from the main entrance and to isolate the site from surrounding areas. Solid fence should be used so as internal construction sites cannot be visible from the main roads

Install and maintain signboards with project information at the sites

Place warning signs near the entrance of the sites to direct traffic to slow down and avoid dangerous locations

Maintain lighting the site at night time

Allocate site officer responsible for environmental and safety issues

5.1.3.2. Air quality and noise level management

The following measures will be implemented by the contractors:

VS 6438 - 2001 is used as a basis for assessing the emissions from traffic vehicles with parameters such as CO, hydrocarbon (HC), smoke. All vehicles used for the project must be approved by the Construction Supervisor and the contractor must submit the certificate of emissions issued by the Registry Department when required.

The project will comply with Vietnamese noise standard 5949-1998. Any machine, equipment and vehicles in use will not generate excessive emission or noise. Avoid operating may activities that generate high level of noise at the same time.

All vehicles loaded with soil, sand etc. will be covered tightly make sure that such materials are not dropped down during the movement of vehicles

water the road crossing residential areas near construction sites in dry weather.

Concrete mixing station, asphalt plants shall be located in area where far a minimum of 200 meters from the residential area (using concrete mixing stations installed emission treatment system).

Heating of bitumen will take place at the end of wind direction

Construction activities that generate big noise such as pile driving should not take place at night time or early morning, i.e. between 10 pm to 6 am. If night time construction is not avoidable, the contractor should coordinate with construction supervisor to inform local authority and affected community

Avoid loading construction materials, top soils outside the proposed resettlement sites

Place warning signs to restrict the use of horns near Le Loi primary and secondary school (Le Loi RS) and children hospital in Vinh Niem Ward.

5.1.3.3. Water quality management

When leveling, bulldozer drivers will make sure that materials does not fall into irrigation canals in Bac Son and Le Loi resettlement sites (RS), the An Kim Hai irrigation canal in Dang Cuong RS, or the Re river in Le Loi RS. When required by construction supervisor, temporary embankments should be set up before leveling or loading of materials

Avoid polluting the water canals or river in the project area by any construction activities. Wastewater from all of the construction sites will be collected into sedimentation tanks before being discharged. Washing of construction equipment in canals is forbidden.

Wastewater from construction camps will not be discharged directly into Re river at Le Loi resettlement site

Construction materials such as sand or excavated top soil will not be loaded within 50 m from canals. Where heavy rain is predicted, the contractors will cover construction materials to minimize washing off materials by rainwater

Ditches will be created surrounding materials loads to lead surface water to sedimentation tanks before leaving the sites.

Oil and fuel storage areas must be roofed and bound to control leakage. Empty barrels will not be placed on open ground and should be returned to supplier as early as possible

Maintenance and repair of construction plants must be conducted in workshops. No maintenance of machinery will take place at construction site.

Discharge of wasted onto soil or water is forbidden. Wasted oil will be collected, stored in tight containers and returned to supplier or registered vendors.

Septic tank or mobile toilets must be provided for use at all workers' camps and contractor's site offices

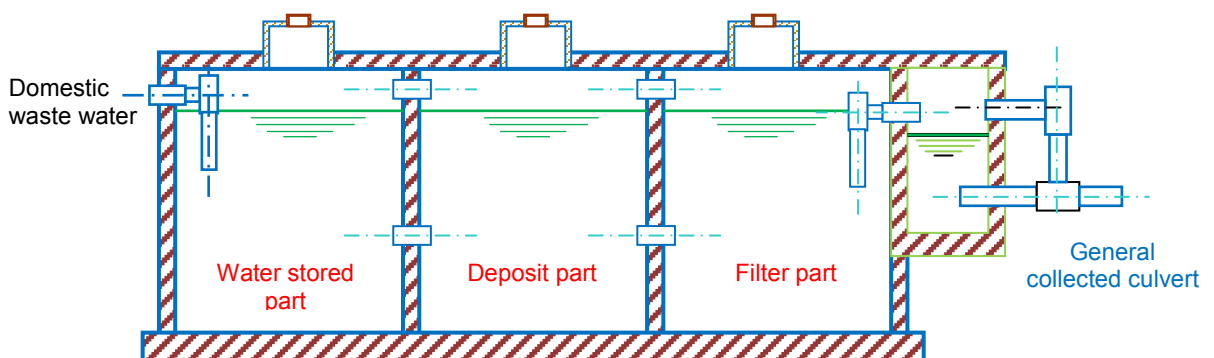


Figure 4.2. septic tanks

5.1.3.4. Solid waste management

The contractor will:

- Transport top soils to the sites instructed by local authorities or construction supervisor for tree planting or agricultural production
- Provide garbage bins at all construction sites, workers camps and Site offices.
- Contract with Hai Phong City Urban Environment Project for regular waste collection.
- Promote reuse and recycling of wastes. Non-hazardous construction wastes such as top soils, broken bricks, fault concretes, broken formworks etc. should be reused for leveling where possible. Packaging materials can be sold to recycle business which is common in project area.
- Burning or dumping of wastes onsite is forbidden
- Disposal of rubbish into Re rivers and irrigation / drainage canals is forbidden.
- Wastes should be transported to approved disposal sites as soon as possible
- Before leaving the sites, the contractor will remove all wastes to make sure that the site is left with waste-free.

5.1.3.5. Health and safety for workers and community

- Provide adequate protective clothing such as hard hats, gloves, booths, protective cloths, belts for working at height etc. and enforce the use by workers
- Provide first aid-kits in contractor's site office
- Worker's site accommodation will have adequate clean water and sanitation facilities such as septic tank toilets with running water, bathrooms
- All slops created during excavation works, particularly pipe trenches and pile foundations will be protected to prevent erosion and ensure stability. All open holes such as manholes, pipe trenches, excavated pole foundations etc. will be fenced and with adequate warning signs
- The end of bulky items such as bamboos, long steel bards, water supply/drainage pipes, electrical wire rolls, piles etc. will be tied with warning signs if they do not fit within the length of trucks
- Fence construction areas if construction activities take place on existing roads. Allocate workers to guard and guide traffic during unloading or installation of bulky items such as piles, poles
- No trucks will be overloaded.

- Flammable such as fuels and oils will be stored away from fire sources. Storage areas will be roofed, fenced to restrict access, with sign boards and portable fire fighting equipment
- Alcohol consumption, gambling is forbidden to workers during working hours
- Communicate to raise worker's awareness on HIV/AIDs
- Place warning sign boards to control speed limits near Le Loi primary and Secondary Schools
- Temporarily loading of construction materials or wastes will be at least 50 m from any schools, factories, clinics and at least 100 m from any temples or cultural house otherwise materials must be removed within no more than 24 hours,

5.1.3.6. Avoid local flooding

The contractor will implement the followings:

- Construction and maintenance of adequate drains to ensure that rain water and wastewater from construction sites do not cause flooding to the surrounding areas.
- Pump water or divert flow to address flooding issue if heavy rain cause temporary flooding.

5.1.3.7 Social impacts management

Project owner will inform local authorities about construction schedule. Local authorities will advise project owner, who will then inform the contractors about the time such as harvesting, local festivals where construction activities should be avoided.

The contractor will:

- recruit local labors to carry out simple/unskilled construction works.
- Inform local authorities about the names of workers to be at the project area
- Schedule construction activities to suit local needs. Temporary halt construction activities during peak harvesting periods
- Contractor's vehicles must give way to pedestrians, children, agricultural machinery and equipment travelling on roads in project areas
- Avoid loading of bulky materials such as water supply or drainage pipes, electrical poles on the roads. Construction activity will not temporarily occupy more than a half of road width at any time, otherwise alternative access and traffic direction must be provided.

- Provide alternative roads and/or access to houses if construction activities temporary block traffic on roads or access to houses
- Add measures to minimize the impacts on existing residential areas of Bac Son resettlement site

5.1.3.8 Control impacts on existing infrastructures

The contractor will:

- Inform Project owner about construction schedule so as affected community can be fully informed
- Build replacement canals, roads etc. before blocking existing canals or roads In all resettlement sites. Coordinate with local authorities to ensure that the services are reconnected earliest possible.
- Inform local authorities about the names of workers to be at the project area
- Coordinate with local power supply authority to minimise local power cut off when energizing power new supply with existing systems or temporary power cut off during the construction at Dang Cuong, Vinh Niem and Dong Hoa RS.

5.1.3.9 Landscape Management

The contractor will:

- Leveling all borrow pits and temporary disturbed areas when the sites are no longer in use and before construction is completed
- Clean up, remove all unused materials and wastes, reinstate all disturbed sites before demobilizing workers from the sites

5.1.3.10 Control Impacts on Physical Cultural heritages

Chance find Procedures

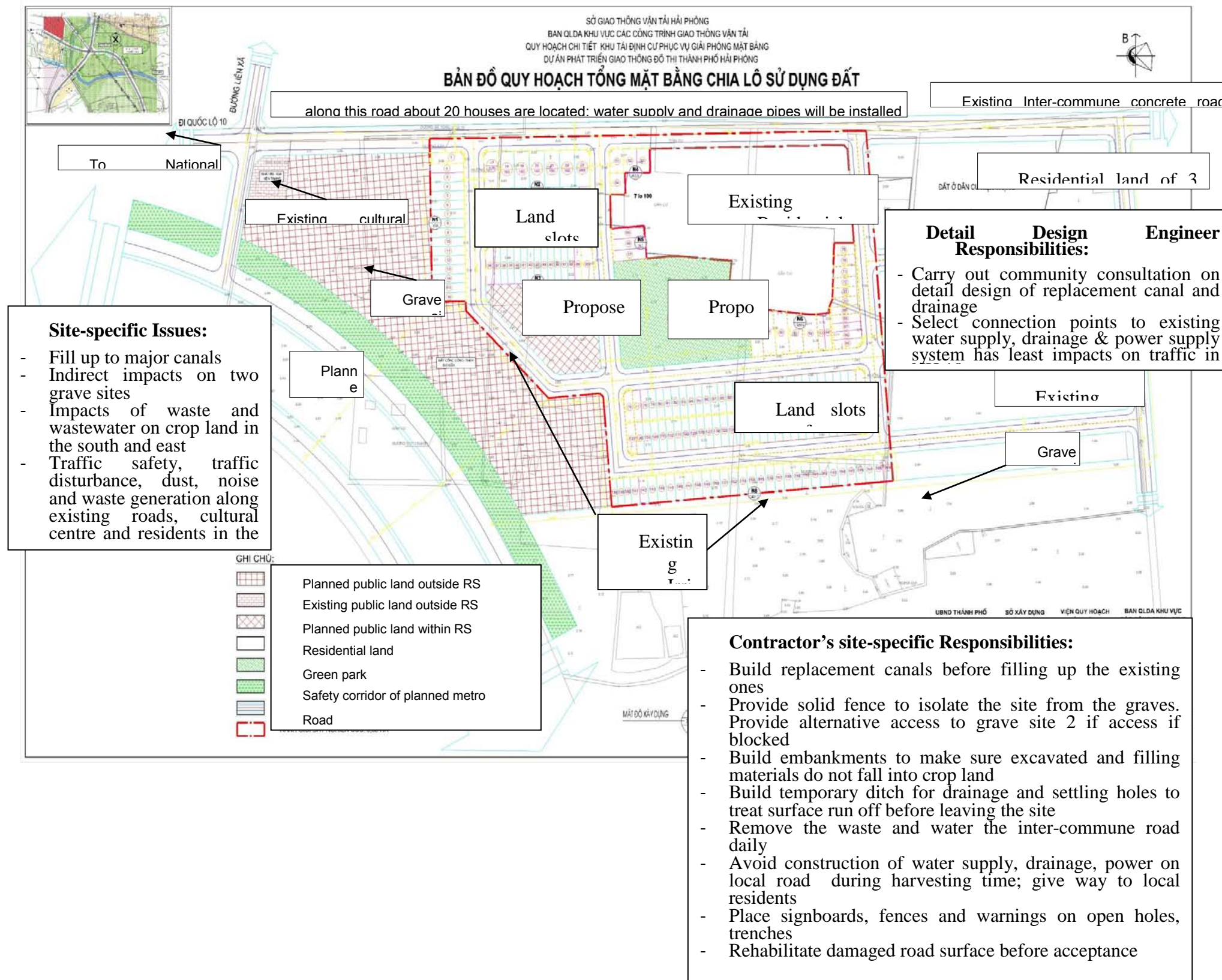
- When an cultural, archaeological object or a grave is discovered during excavation works, the contractor will halt construction activities at that site until formal permission is granted to allow contractor to continue his work. The contractor will be responsible for protecting the sites and inform the construction supervisor and project owner
- Project owner and construction supervisor will inform local authority. If a grave is found, local authority will inform the public on commune speaker and allow at least two weeks for relocation if families are identified. If not, local authority will

coordinate with contractor to prepare a drawing indicating the location where the grave is found and identify the location for grave relocation. The drawing will be kept at Commune People's office

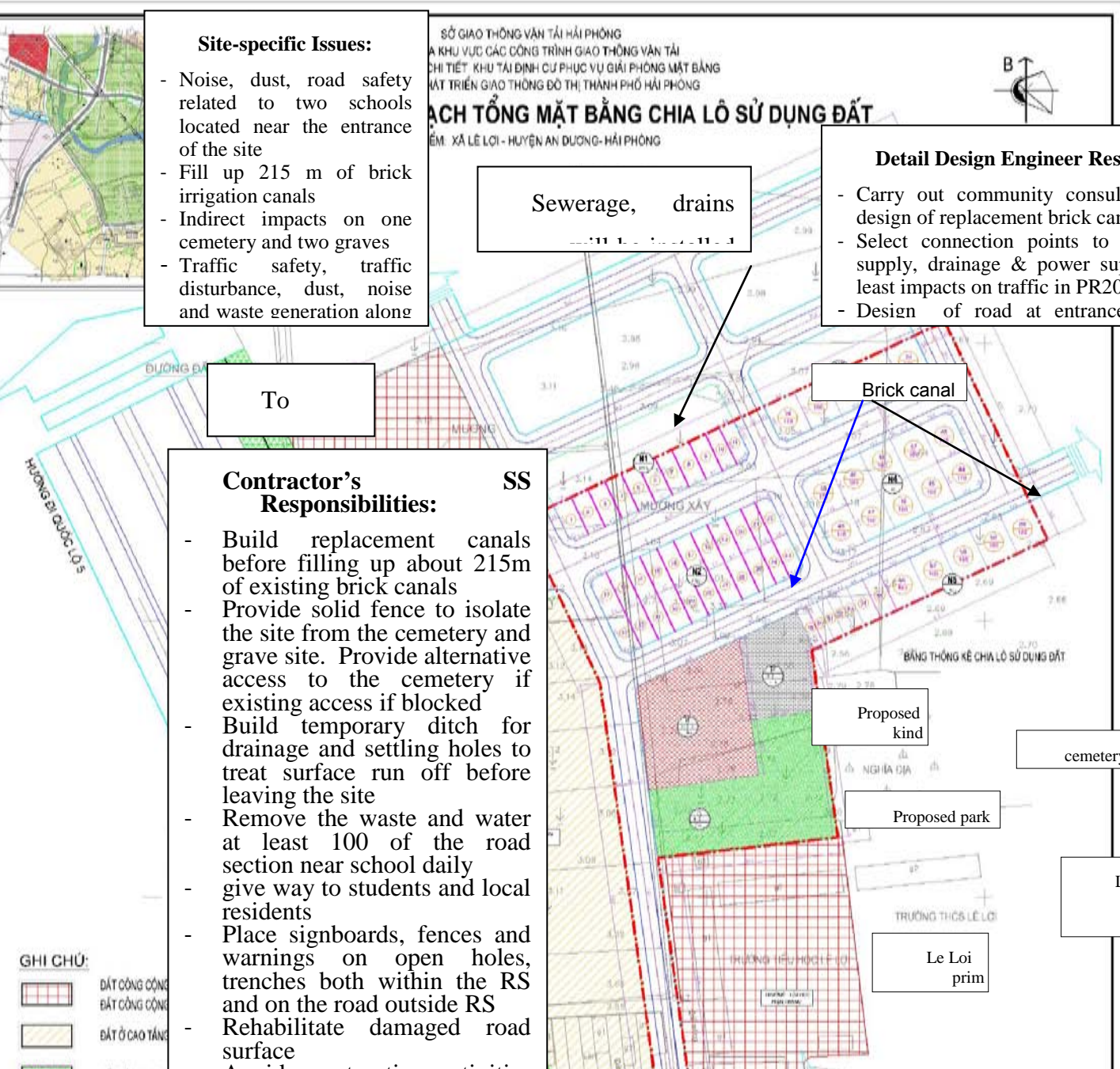
- If a cultural/archaeological object is found, local museum will be contacted. Officer from local museum will carry out initial assessment and advise project owner on the steps that the contractor has to follow. If important object or site is discovered, local museum will contact the Institute of Archaeology for further assessment and advice on next steps.

5.1.3.11 *Site-specific Mitigation Plan*

Bac Son Resettlement site



1. Le Loi Resettlement Site



Site-specific Issues:

- Noise, dust, road safety related to two schools located near the entrance of the site
- Fill up 215 m of brick irrigation canals
- Indirect impacts on one cemetery and two graves
- Traffic safety, traffic disturbance, dust, noise and waste generation along

Detail Design Engineer Responsibilities:

- Carry out community consultation on detail design of replacement brick canal and drainage
- Select connection points to existing water supply, drainage & power supply system has least impacts on traffic in PR208
- Design of road at entrance include speed

To

Contractor's Responsibilities:

SS

- Build replacement canals before filling up about 215m of existing brick canals
- Provide solid fence to isolate the site from the cemetery and grave site. Provide alternative access to the cemetery if existing access is blocked
- Build temporary ditch for drainage and settling holes to treat surface run off before leaving the site
- Remove the waste and water at least 100 of the road section near school daily
- give way to students and local residents
- Place signboards, fences and warnings on open holes, trenches both within the RS and on the road outside RS
- Rehabilitate damaged road surface

Sewerage, drains

Brick canal

Proposed kind

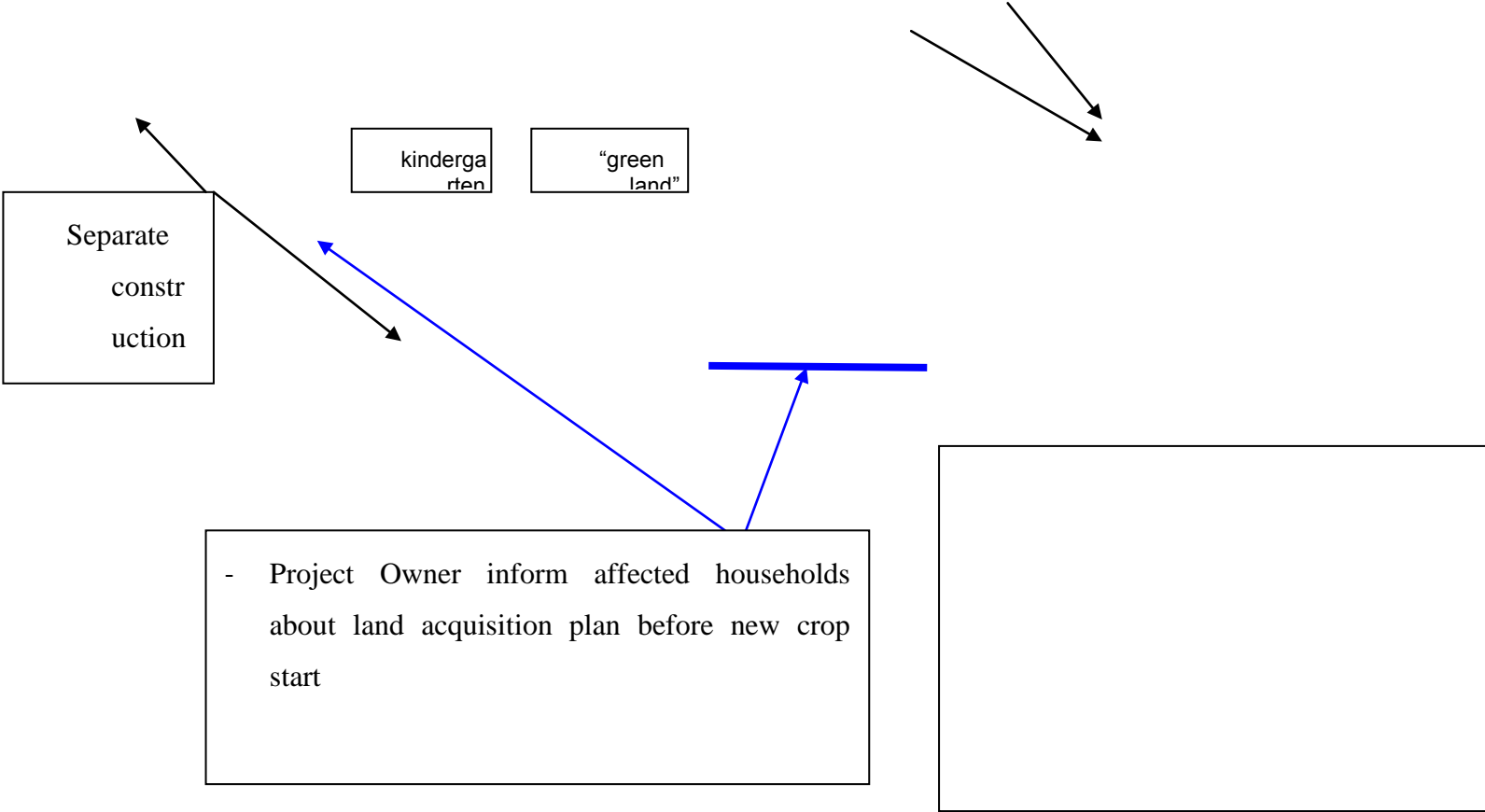
Proposed park

Le Loi prim

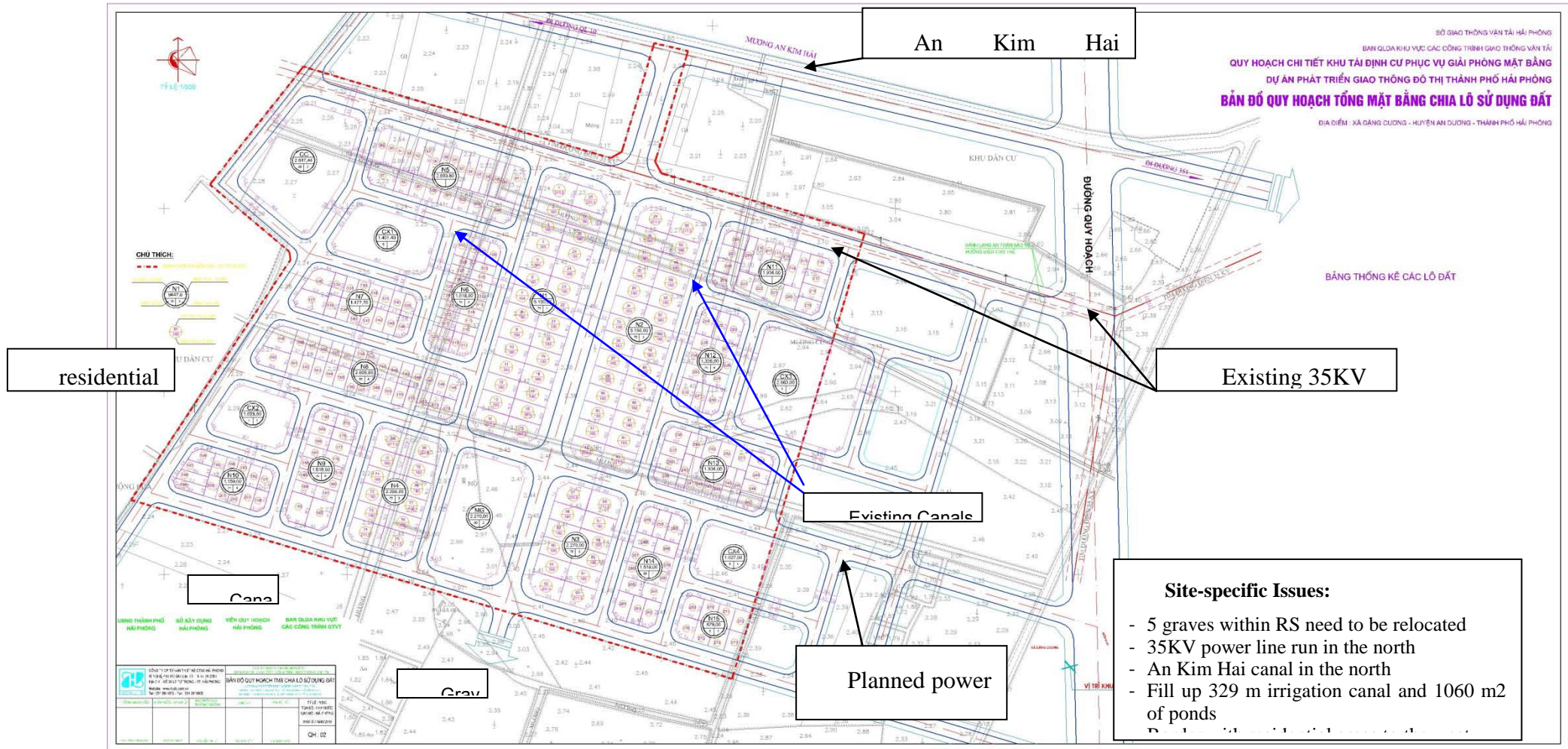
cemetery

Le Loi Seco ndar

GHI CHÚ:
 [Symbol] ĐẤT CÔNG CỘNG
 [Symbol] ĐẤT CÔNG CỘNG
 [Symbol] ĐẤT Ở CAO TẦNG



3. Dang Cuong Resettlement site



Project owner responsibility:

- coordinate with local authority to arrange for relocation of graves before handing over the site to contractor. Sketches showing the location of the graves before and after relocation is prepared and maintained at CDC office

Contractor Site specific responsibilities:

- Build replace irrigation canal before leveling. Build solid fence to separate residential areas to the west
- Parking of construction plants, loading of construction materials & equipment outside 35KV corridor. Make sure construction activities take place within high clearance of electrical lines. Remove construction plants from safety corridors as leveling is completed.

4.Hong Thai Resettlement

Hoang Mai
Cemetery

Site-specific Issues

- 110 KV Power lines run in the north
- Part of aquaculture ponds and irrigation canals will be filled in
- An existing river dyke is 100 m south of PS

110 KV power line
- lines will be

Existing

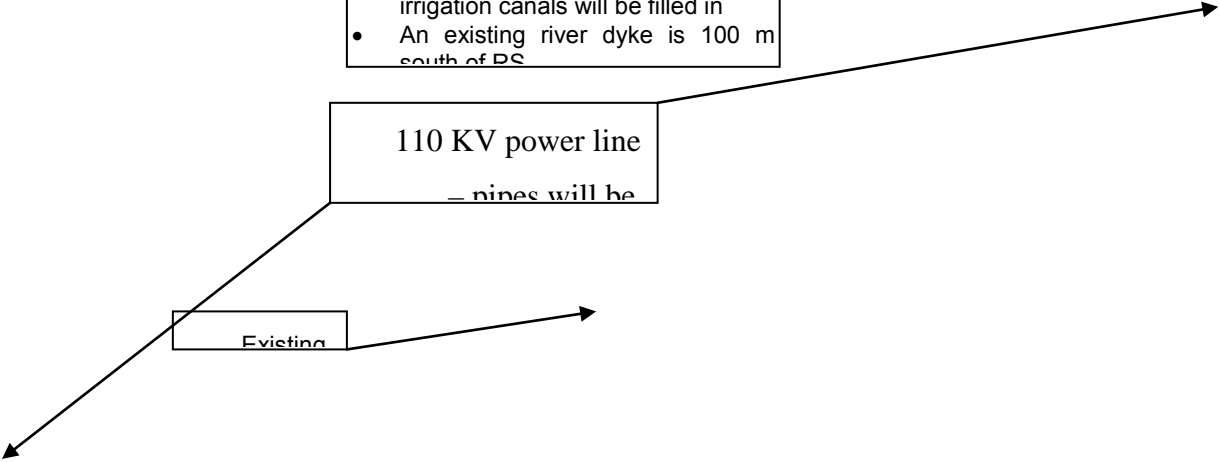
Contractor's site-specific responsibilities:

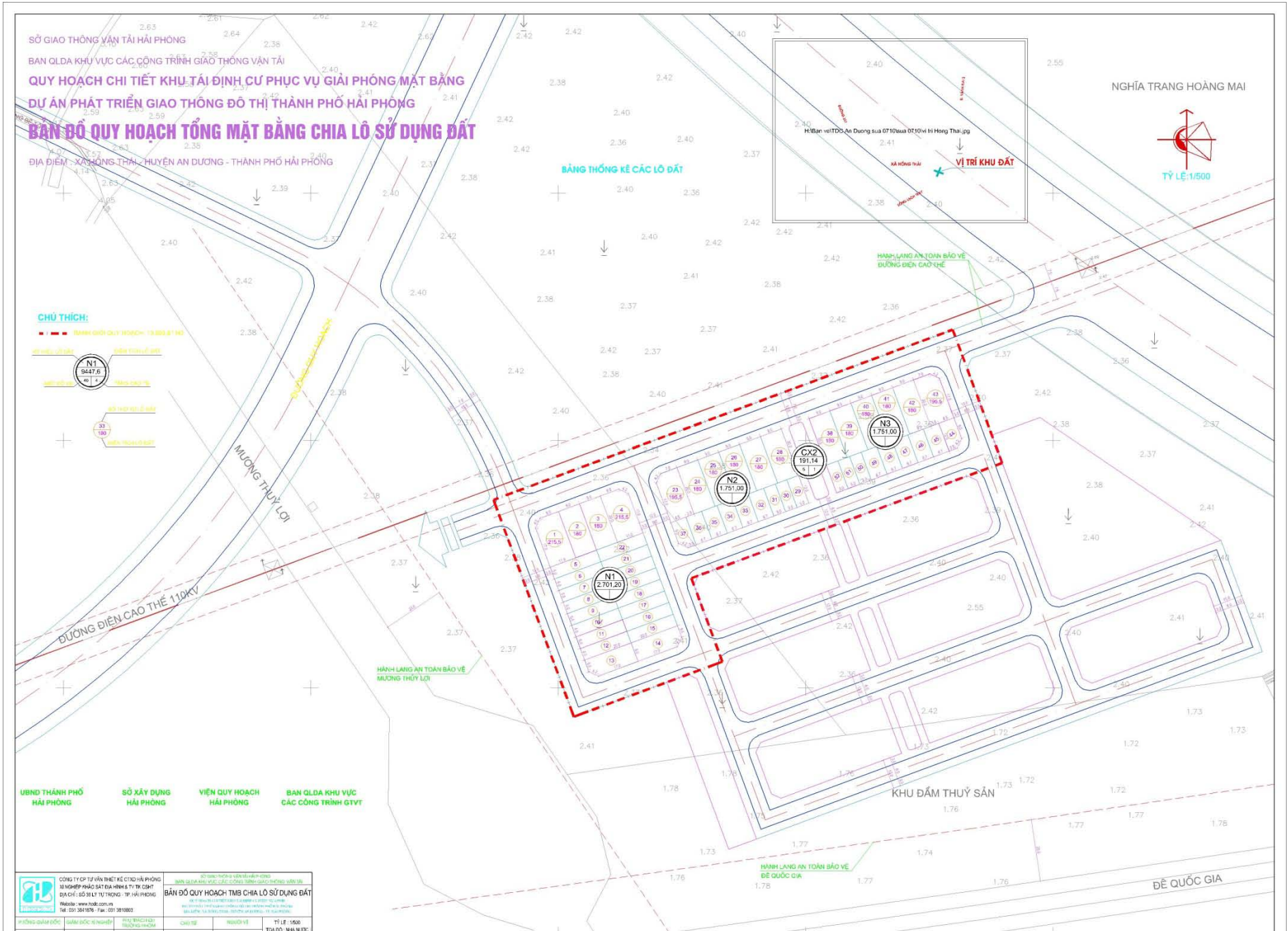
- Parking of construction plants, loading of construction materials and equipment outside 110KV electrical safety corridor
- Remove construction plants from safety corridors as leveling is completed.
- Construction activities take place within 110KV high clearance
- Disposal of wastes into agricultural land or irrigation canal is forbidden
- Loading of construction plants, materials onto the dyke and access to the

Existing aquaculture
ponds

Project Owner:
Inform owner before new
aquaculture crop start and

Existing river
embankment 100



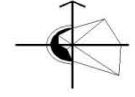


5. Vinh Niem Resettlement

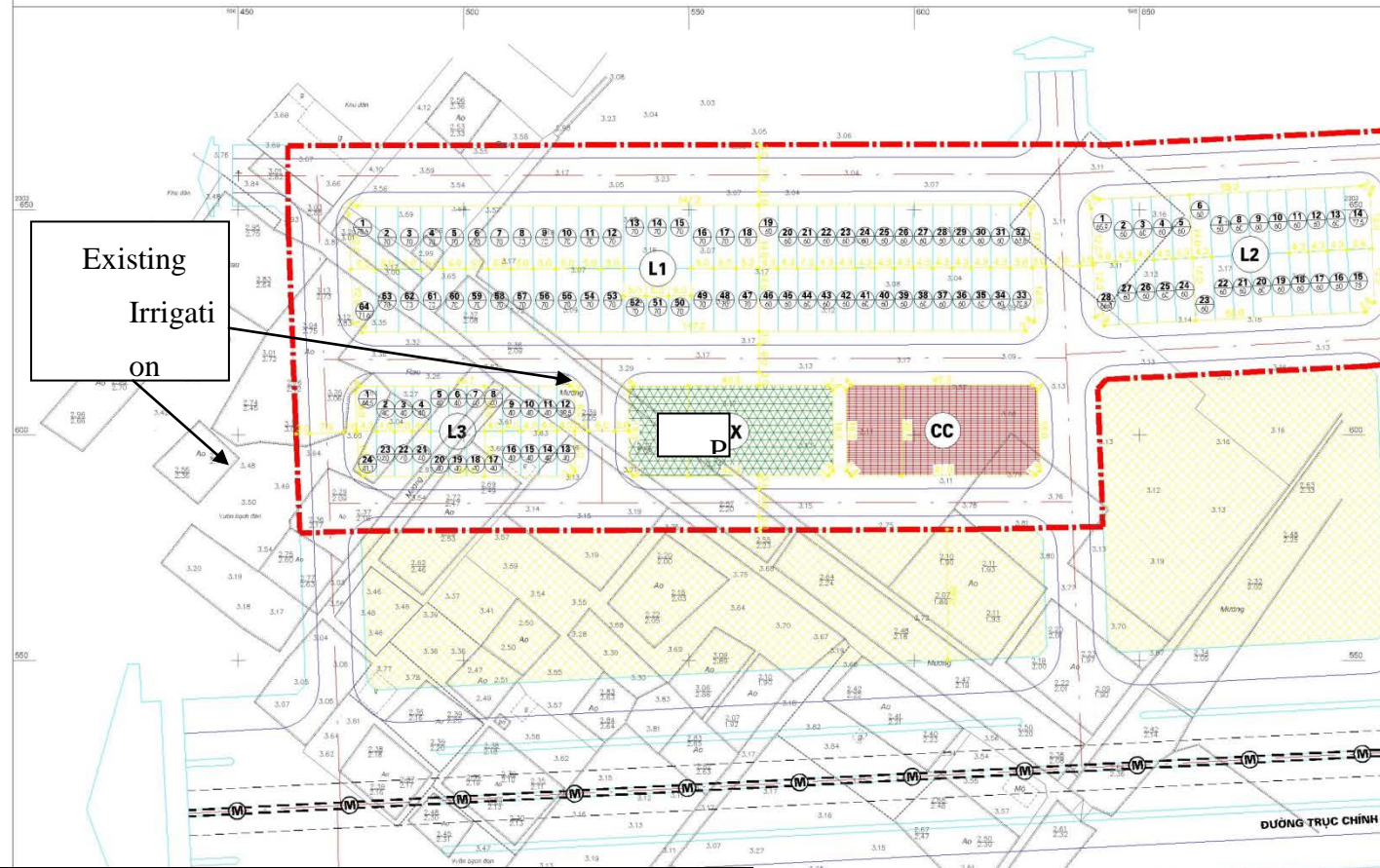
SỞ GIAO THÔNG VẬN TẢI HẢI PHÒNG
BAN QLDA KHU VỰC CÁC CÔNG TRÌNH GIAO THÔNG VẬN TẢI
 QUY HOẠCH CHI TIẾT KHU TÁI ĐỊNH CƯ PHỤC VỤ GIẢI PHÓNG MẶT BẰNG
 DỰ ÁN GIAO THÔNG ĐÔ THỊ HẢI PHÒNG

BẢN ĐỒ QUY HOẠCH CHIA LÔ

ĐỊA ĐIỂM: KHU TÁI ĐỊNH CƯ PHƯƠNG VINH NIỆM - QUẬN LÊ CHÂN- THÀNH PHỐ HẢI PHÒNG



TỈ LỆ : 1/500



Existing Irrigation

Site-specific Issues

- 5 households will be relocated
- Border with existing crop land
- some irrigation canals will be filled

KÍ HIỆU:
 KÝ HIỆU LÔ ĐẤT **A**
 KÝ HIỆU SỐ THỨ TỰ LÔ ĐẤT **1**
 DIỆN TÍCH LÔ ĐẤT (M2) **60**

Contractor's responsibilities:

- Build replacement canals before filling and leveling
- Fence to separate construction site from crop land
- Collect and treat wastewater with settling tanks before discharge. Disposal of wastes or wastewater into agricultural land or canal is forbidden

Project Owner:
 Inform farmers about land acquisition schedule before new crop

UBND TP HẢI PHÒNG BỞI XÂY DỰNG HẢI PHÒNG VIỆN QUY HOẠCH HẢI PHÒNG BAN QLDA KHU VỰC CÁC CT GTVT

Khu nghĩa địa Gốc Giếng

BẢN ĐỒ QUY HOẠCH CƠ CẤU SỬ DỤNG ĐẤT

CHỖ THÌ THIẾT KẾ TỶ LỆ 1/500

PHẠM VĂN TÙNG PHẠM NGỌC CÔNG NỮA ĐỒ: NHÀ NƯỚC CAO ĐỘ: HẢI PHÒNG

TRANG.../...NĂM 2010 QH: 02

6. Dong Hoa 1

Site-specific Issues:

- 220KV power line runs northwest-southeast along the eastern border
- Bach Nghe college is located in the north of RS
- Children hospital on the northeast
- An Duong Vocational School to the east
- Residential areas in the west
- 10 houses are located along 208 PR as access road from the south
- About 115 m irrigation canals will be filled up
- Water supply connection point cross existing

ĐƯỜNG MẶT BẰNG
PHÒNG
SỬ DỤNG ĐẤT
PHỐ HẢI PHÒNG

Bach Nghe

Children

Existing

Existing Road,

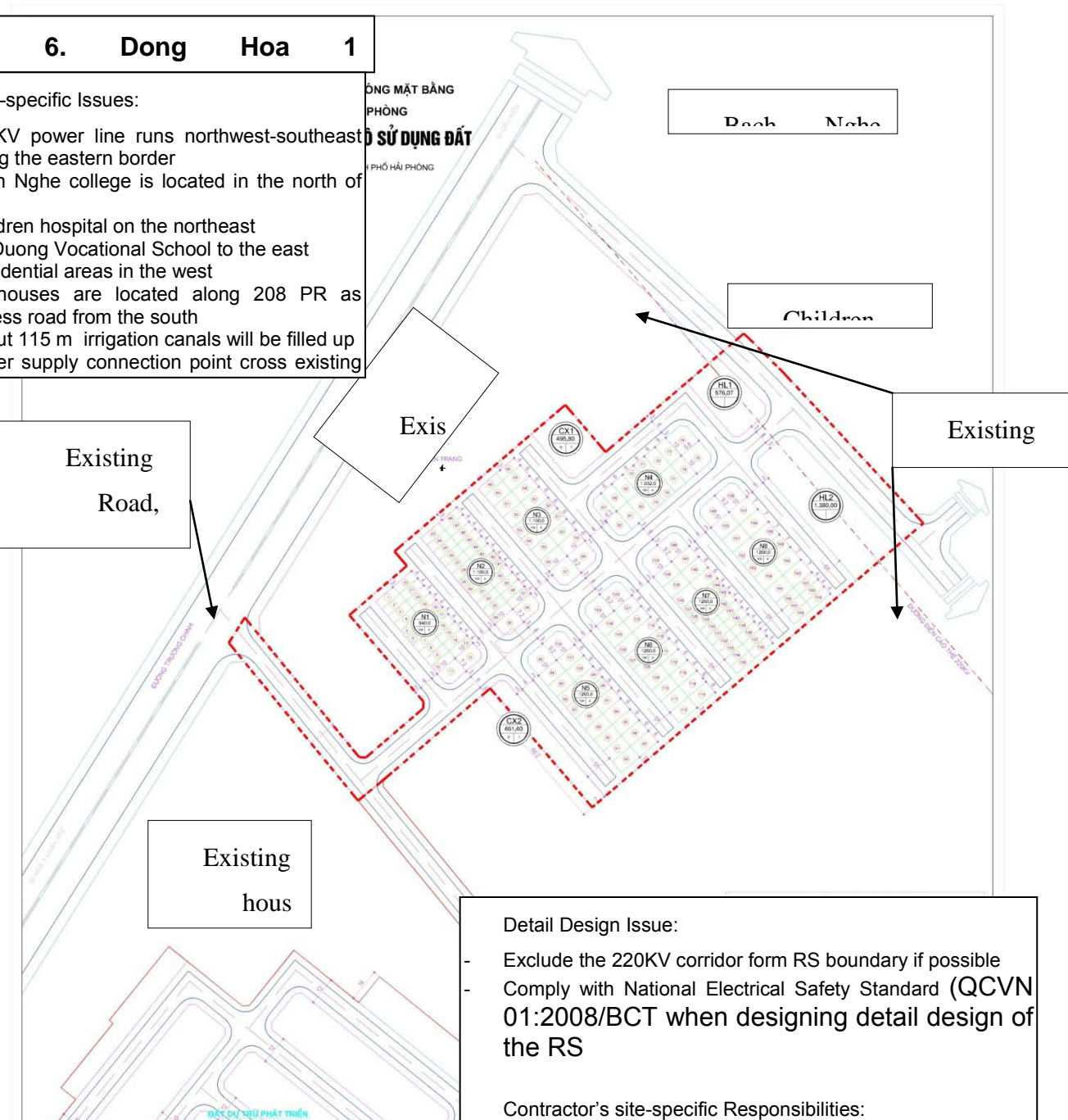
Exis

Existing hous

Detail Design Issue:

- Exclude the 220KV corridor from RS boundary if possible
- Comply with National Electrical Safety Standard (QCVN 01:2008/BCT when designing detail design of the RS

Contractor's site-specific Responsibilities:



7. Dong Hoa 2 Resettlement

Site-Specific Issues:

Existing 2 m wide road in the north and 5 m wide road in the east

780 m² of ponds will be filled up

There is a residential area in the west

Contractor's site specific responsibilities:

- Build compensation irrigation canals before filling
- Build ditches to collect and treat waste water before discharge
- Disposal of waste, wastewater into crop land is forbidden



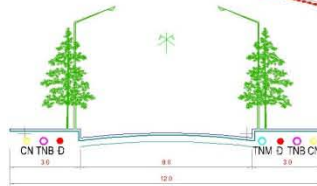
Green park

BẢNG CÂN BẰNG ĐẤT

STT	LOẠI ĐẤT	DIỆN TÍCH (M ²)	TỶ LỆ (%)
1	ĐẤT GIAO THÔNG	9.913,2	49
2	ĐẤT Ở	10.122,7	48,5
3	ĐẤT CÂY XANH	522,1	2,5
TỔNG		20.685	100%

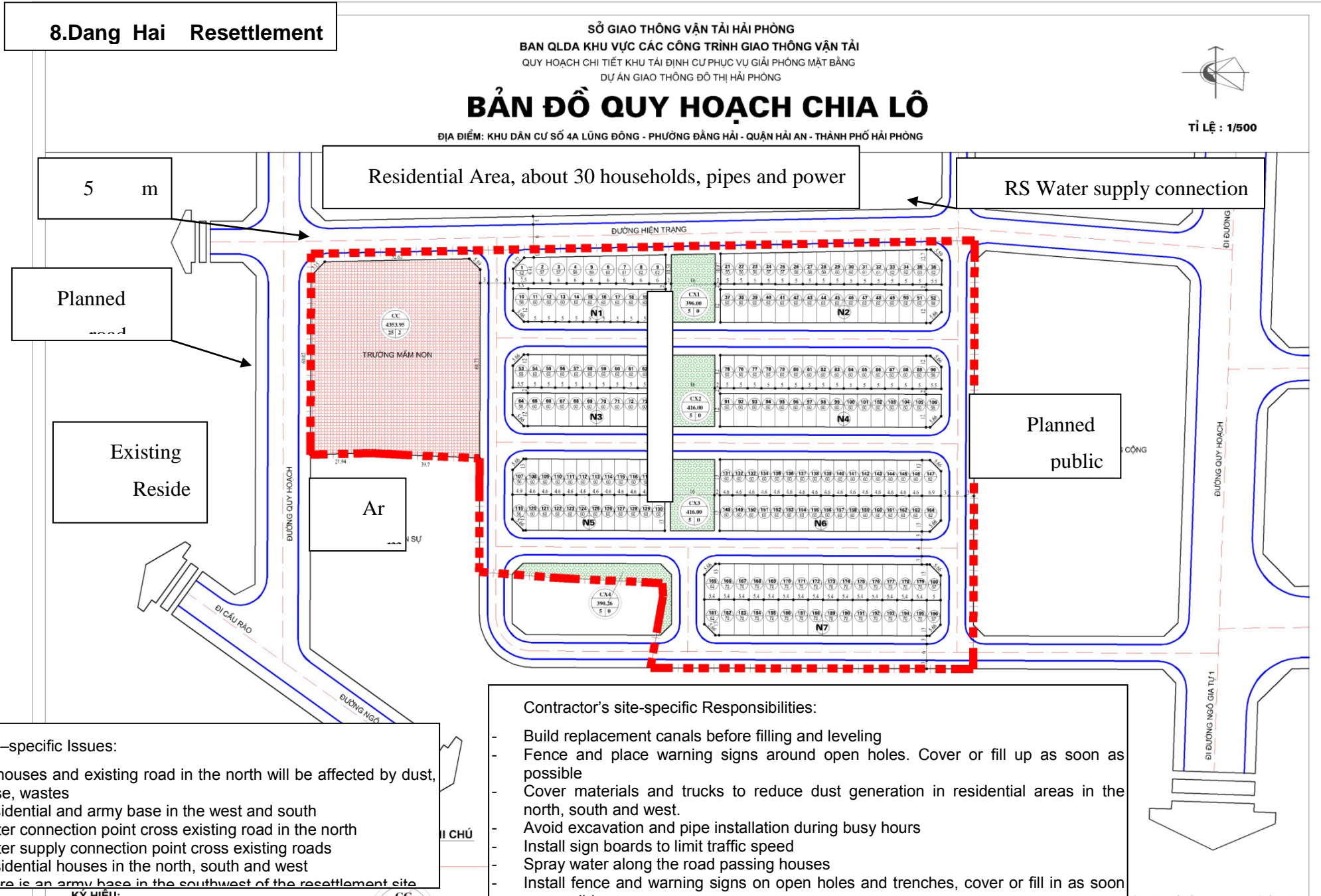
GHI CHÚ:

-  CHIA LÔ ĐỨC DIỆN TÍCH 90M²: 42 LÔ
-  CHIA LÔ ĐỨC DIỆN TÍCH 70M²: 80LÔ
-  CHIA LÔ ĐỨC DIỆN TÍCH 40M²: 20 LÔ
-  ĐẤT CÂY XANH THỂ THAO



MẶT CẮT 1-1

HCDC CÔNG TY CỔ PHẦN TƯ VẤN THIẾT KẾ CÔNG TRÌNH VÀ QUẢN LÝ DỰ ÁN ĐẦU TƯ VÀ XÂY DỰNG TRUNG TÂM TƯ VẤN THIẾT KẾ VÀ QUẢN LÝ DỰ ÁN ĐẦU TƯ VÀ XÂY DỰNG	BAN QLDA KHU VỰC CÁC CT GTVT KHU ĐẤT TÁI ĐỊNH CỬ CHIA ĐY AN HƯỚNG ĐIỀU KHIỂN VÀ QUẢN LÝ DỰ ÁN		T.K.Q.H
	QUY HOẠCH SỬ DỤNG ĐẤT ĐỊA ĐIỂM: P. ĐÔNG HÒA - Q. KIẾN AN - TP. HẢI PHÒNG		QH : 03
TỔNG GIÁM ĐỐC	XÍ NGHIỆP THIẾT KẾ VÀ XÂY DỰNG 1		TỈ LỆ: 1/500
GIÁM ĐỐC	CHỦ TRÌ	THIẾT KẾ	HOÀN THÀNH
CAO MINH KHANG			06/2018

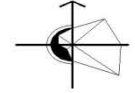


9.Nam Hai 1 Resettlement

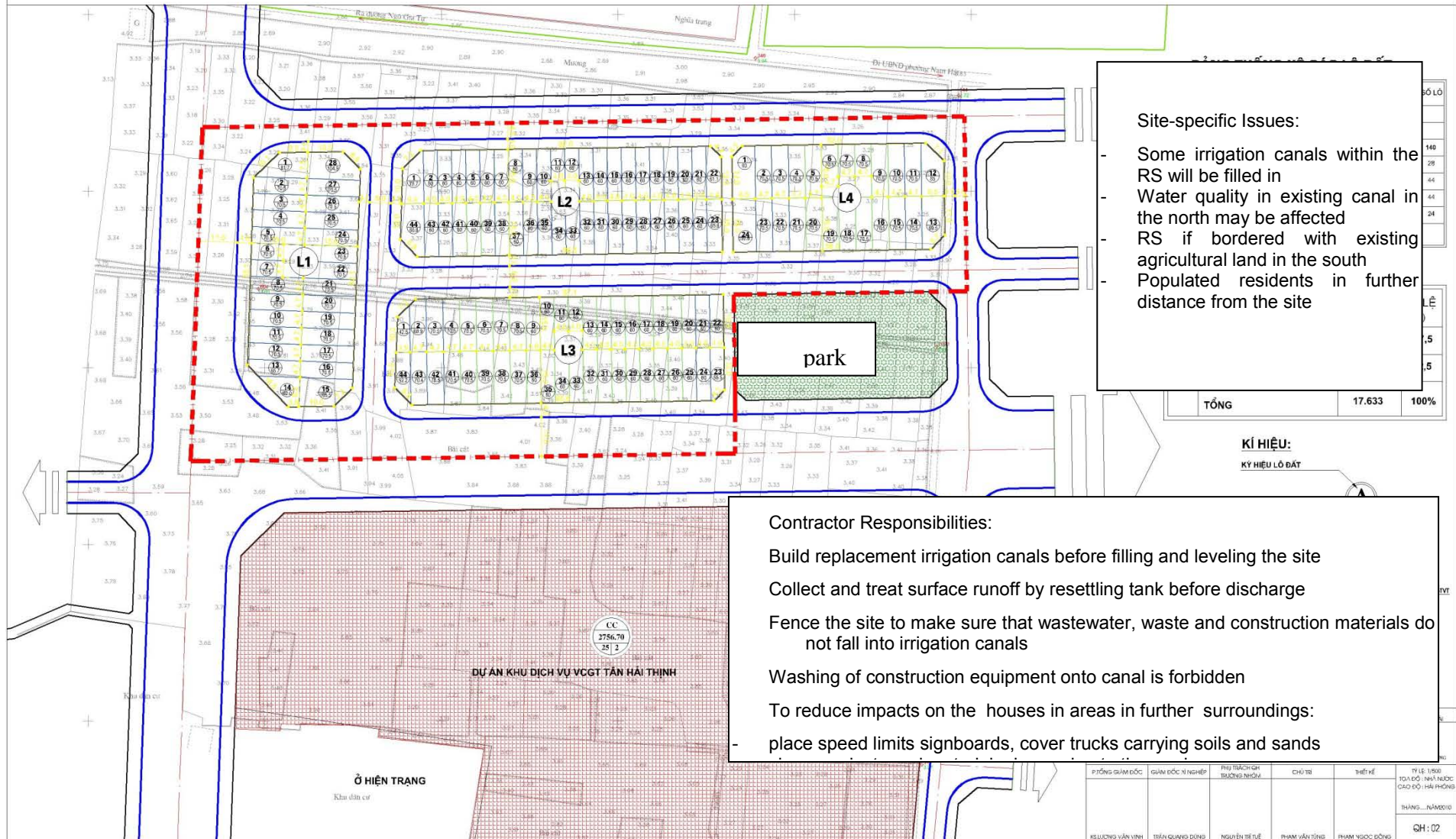
SỞ GIAO THÔNG VẬN TẢI HẢI PHÒNG
BAN QLDA KHU VỰC CÁC CÔNG TRÌNH GIAO THÔNG VẬN TẢI
 QUY HOẠCH CHI TIẾT KHU TÁI ĐỊNH CƯ PHỤC VỤ GIẢI PHÓNG MẶT BẰNG
 DỰ ÁN GIAO THÔNG ĐÔ THỊ HẢI PHÒNG

BẢN ĐỒ QUY HOẠCH CHIA LÔ

ĐỊA ĐIỂM: KHU TÁI ĐỊNH CƯ NAM HẢI SỐ 1, PHƯỜNG NAM HẢI - QUẬN HẢI AN - THÀNH PHỐ HẢI PHÒNG



TỈ LỆ : 1/500



Site-specific Issues:

- Some irrigation canals within the RS will be filled in
- Water quality in existing canal in the north may be affected
- RS if bordered with existing agricultural land in the south
- Populated residents in further distance from the site

TỔNG	17.633	100%
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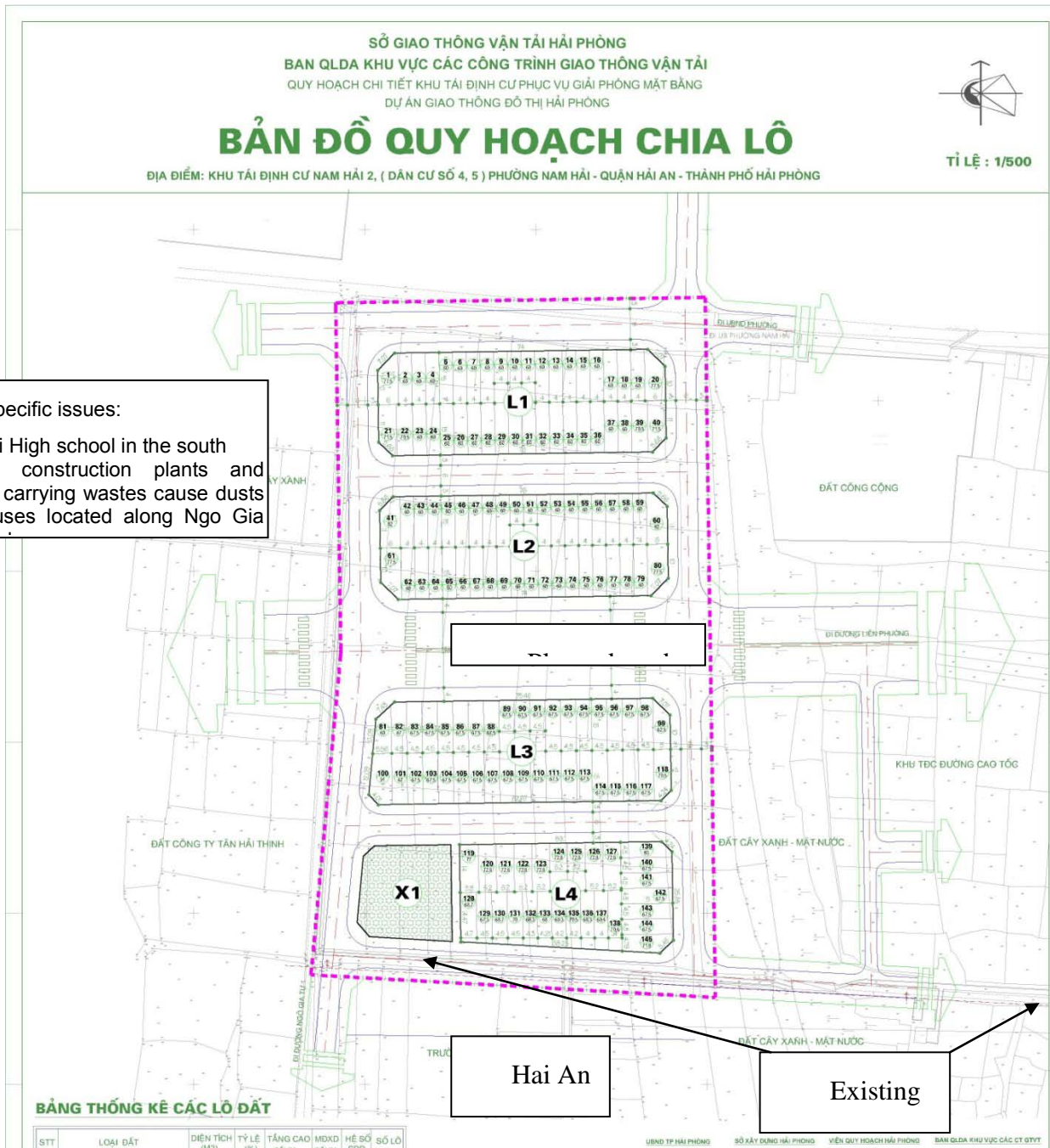
KÍ HIỆU:
 KÝ HIỆU LỘ ĐẤT

Contractor Responsibilities:

- Build replacement irrigation canals before filling and leveling the site
- Collect and treat surface runoff by resettling tank before discharge
- Fence the site to make sure that wastewater, waste and construction materials do not fall into irrigation canals
- Washing of construction equipment onto canal is forbidden
- To reduce impacts on the houses in areas in further surroundings:
 - place speed limits signboards, cover trucks carrying soils and sands

PHÒNG QUẢN ĐỐC	GIÁM ĐỐC NĨ NGHIỆP	PHỤ TRÁCH QH TRƯỜNG NƯỚC	CHỦ TÀI	THIẾT KẾ	TỶ LỆ 1/500
KIẾNG VÂN VINH	TRẦN QUANG DUNG	NGUYỄN THỊ TUỆ	PHẠM VĂN TÙNG	PHẠM NGỌC DƯƠNG	TOÀN ĐỒ NHÀ NƯỚC CHẤU ĐỘ NHÀ PHỎNG
					THÁNG ... NĂM 2010
					SH : 02

10. Nam Hai No.2 Resettlement site in Nam Hai ward



11 Nam Hai 3 Resettlement

SỞ GIAO THÔNG VẬN TẢI HẢI PHÒNG
 BAN QLDA KHU VỰC CÁC CÔNG TRÌNH GIAO THÔNG VẬN TẢI
 QUY HOẠCH CHI TIẾT KHU TÁI ĐỊNH CƯ PHỤC VỤ GIẢI PHÓNG MẶT BẰNG
 DỰ ÁN GIAO THÔNG ĐÔ THỊ HẢI PHÒNG

BẢN ĐỒ QUY HOẠCH CHIA LÔ

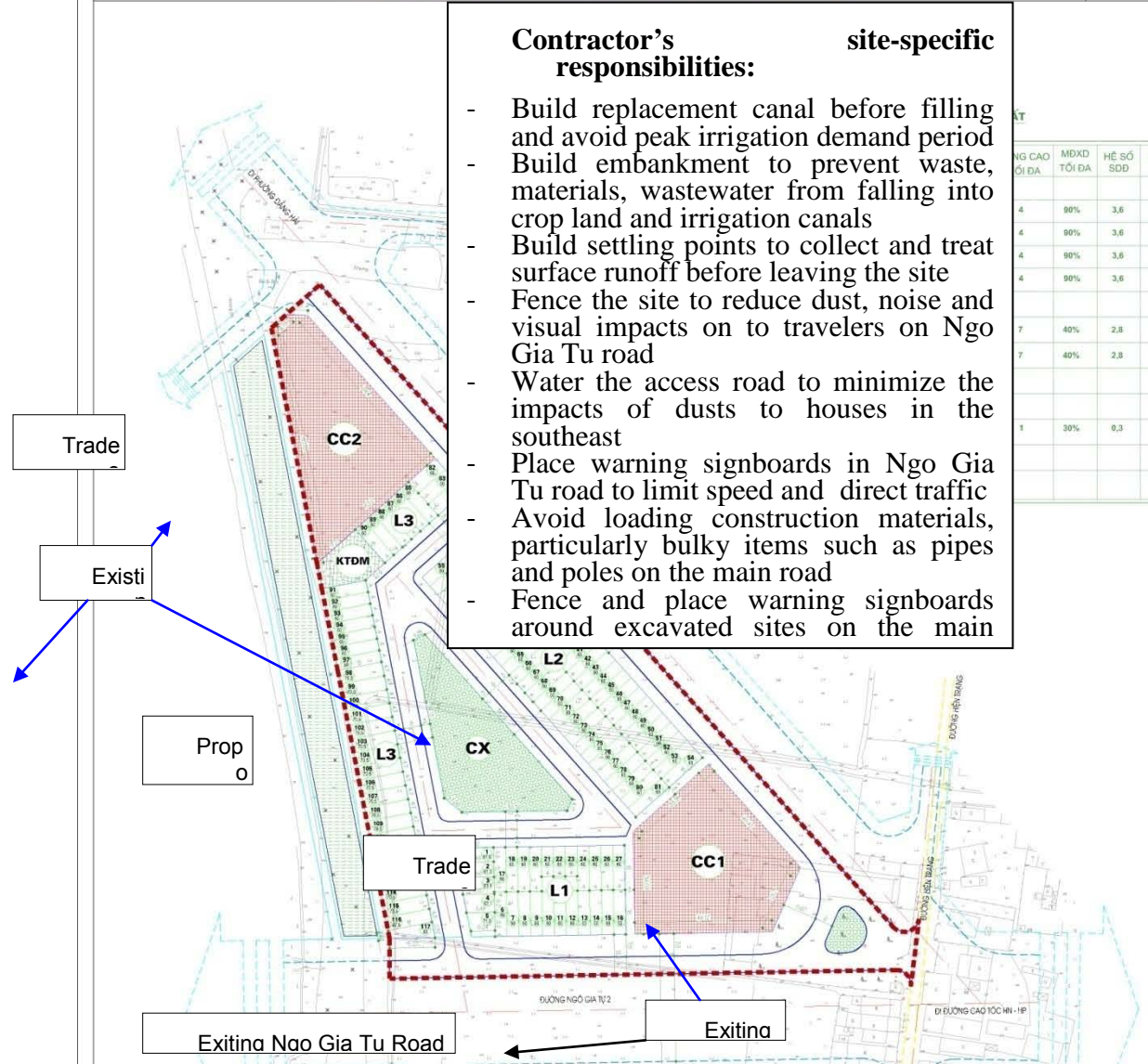
ĐỊA ĐIỂM: KHU TÁI ĐỊNH CƯ NAM HẢI 3, PHƯỜNG NAM HẢI - QUẬN HẢI AN - THÀNH PHỐ HẢI PHÒNG



Contractor's site-specific responsibilities:

- Build replacement canal before filling and avoid peak irrigation demand period
- Build embankment to prevent waste, materials, wastewater from falling into crop land and irrigation canals
- Build settling points to collect and treat surface runoff before leaving the site
- Fence the site to reduce dust, noise and visual impacts on to travelers on Ngo Gia Tu road
- Water the access road to minimize the impacts of dusts to houses in the southeast
- Place warning signboards in Ngo Gia Tu road to limit speed and direct traffic
- Avoid loading construction materials, particularly bulky items such as pipes and poles on the main road
- Fence and place warning signboards around excavated sites on the main

NG CAO TỐI ĐA	MDXD TỐI ĐA	HỆ SỐ SDD	SỐ LÔ
			117
4	90%	3,6	27
4	90%	3,6	54
4	90%	3,6	27
4	90%	3,6	9
			2
7	40%	2,8	1
7	40%	2,8	1
1	30%	0,3	1



12 Trang Cat Resettlement site

SỞ GIAO THÔNG VÀ TÀI CHÍNH
 BAN QLDA KHU VỰC CÁC CÔNG TRÌNH GIAO THÔNG
 QUY HOẠCH CHI TIẾT KHU TÁI ĐỊNH CƯ PHỤC VỤ GIẢI PHÓNG
 DỰ ÁN PHÁT TRIỂN GIAO THÔNG ĐÔ THỊ THÀNH PHỐ
BẢN ĐỒ QUY HOẠCH TỔNG MẶT BẰNG
 PHƯỜNG TRĂNG CÁT, PHƯỜNG TRĂNG CÁT - QUẬN

Detail design consultant:

- Introduce design solution to minimize safety and aesthetical impacts of the 35KV power line
- conduct community

Contractor's site-specific responsibilities

- Build replacement canal before filling and avoid peak irrigation demand period
- Build embankment to prevent waste, materials and wastewater from falling into crop land. Treat surface runoff by resettling tank before discharge
- Disposal of construction waste and wastewater into crop land is forbidden
- Fence the site to reduce dust, noise and visual impacts on Truc pagoda and residential areas
- Avoid placement on construction plants, materials and equipment in the safety corridor of the 35KV power line. Pay attention to high clearance when construction plants work nearby the safety corridor

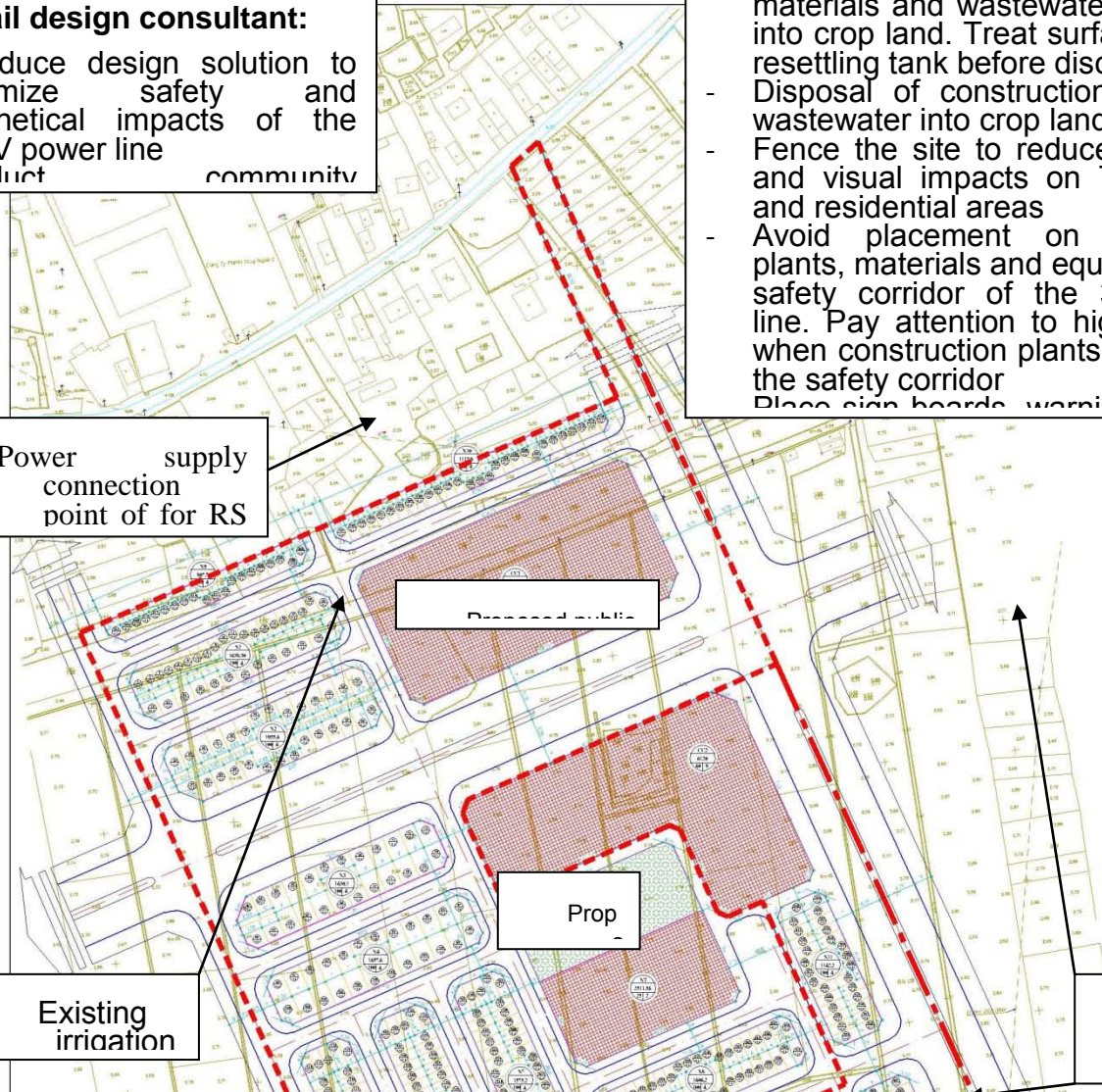
Power supply connection point of for RS

Proposed public

Prop

Existing irrigation

35KV powerline safety



5.1.4. Operation phase

5.1.4.1 Solid Waste Management

The City's People's Committee to direct Hai Phong City Urban Environmental Company, who currently provide solid waste collection service to the city, to extend its waste collection service to cover all resettlement areas. Fees at rates regulated by Hai Phong CPC will be charged to households for operation costs of such services.

5.1.4.2. Water and Power Supply, Other public Services

The operations and usage of water supply, power supply, drainage will be under management of relevant city authorities such as the City's Water Supply Company, City's Electrical Company and in accordance with the city's development plans.

Staffing, operation and management of kindergartens in each resettlement sites will be the responsibilities of district Department of Education and Training.

5.2. Roles and Responsibilities for Environmental Management During Construction of Resettlement Areas

Similar to the main project, proper environmental management during construction requires the involvement of various actors to ensure that adverse impacts are minimize during the construction of the project's 12 resettlement sites. Environmental management during construction involves the Project Management Unit (PMU), the Environmental Management Unit in PMU, Contractors, and Environmental Supervision Engineers of the Construction Supervision Team (CST) and the Independent Environmental Monitoring Consultant (IMC). Figure 13 presents the institutional arrangement for environmental management of the construction of the Bac Son – Nam Hai road and it will also be applied to resettlement sites, except that the roles of individual houses and contractors are also included.

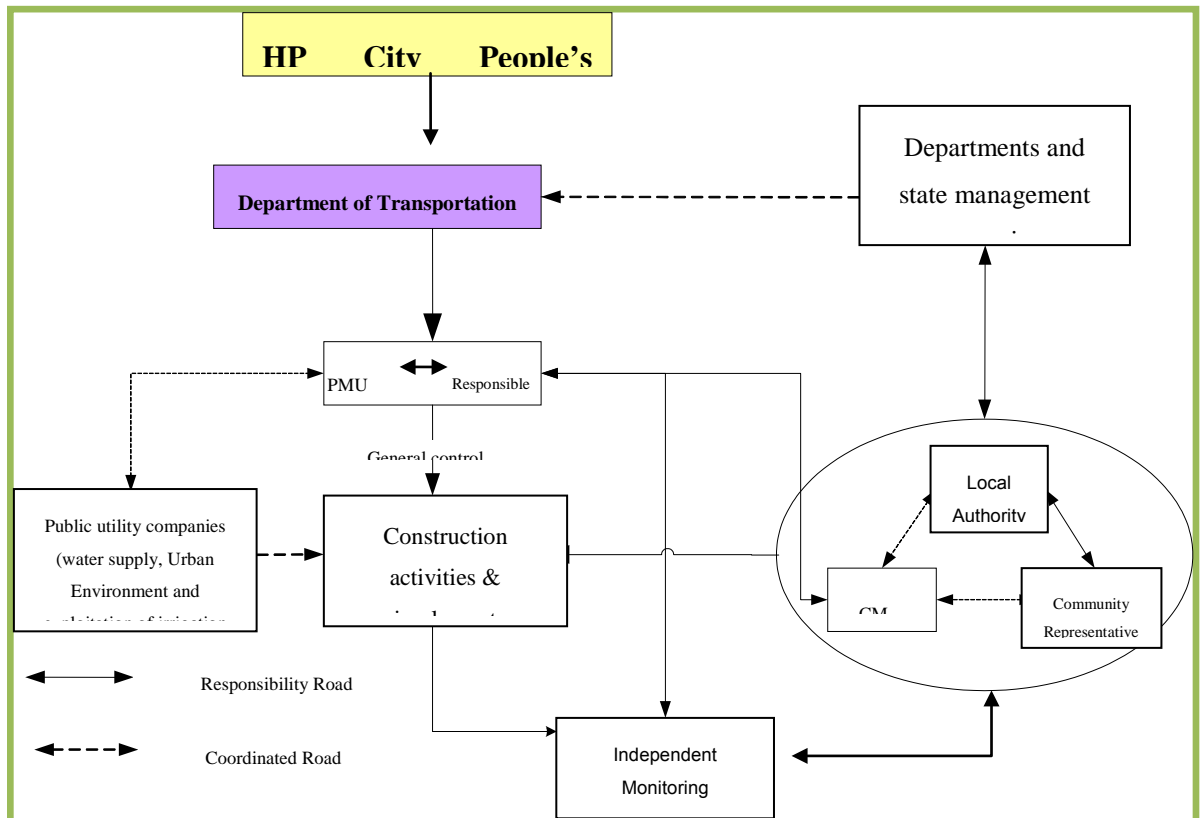


Figure 13: Control & Reporting Line of Environmental Management during construction

Construction phase of the resettlement sites will also be extended to the construction of individual houses, which will be arranged by individual or group of households. Therefore, Table 36 describing the roles and responsibilities of stakeholders has added the roles of individual households who will be moving into resettlement sites regarding very small-scale contracts they will manage.

Table 36: Roles and responsibilities of stakeholders

Agency/Unit	Responsibility
PMU of Department of Regional Transportation Works	As the agency with primary responsibility in implementing and monitoring the environmental management plan. Through consultation and independent monitoring CMC, the PMU will monitor contractors carry out mitigation measures during construction. PMU in close coordination with local authorities to promote community participation in the process of preparing and implementing project. PMU is also responsible for reporting the implementation of environmental management plan to the World Bank and the Department of Natural Resources and Environment.
Environmental Management Unit in PMU	Responsible for monitoring the implementation of WB's environmental safeguard policies in all stages and process of the project. These policies will be applied to all project items, including bidding, signing construction contracts, consultant contracts, assessment of documents and reports, extraordinary site checks, appointing departments, dealing with incidents related to environmental management, etc. The Unit will advise the PMU professional leadership to ensure the

Agency/Unit	Responsibility
	project meets the requirements of environment safety policy and law of Vietnam and World Bank.
Construction Supervision Team (CST)	Responsible for supervising and monitoring all construction activities and for ensuring that Contractors comply with the requirements of the contracts and the EMP. The CST shall engage sufficient number of qualified staff (e.g. Environmental Engineers) with adequate knowledge on environmental protection and construction project management to perform the required duties and to supervise the Contractor's performance. The Environmental Engineers shall be lead by a Workplace Safety and Environment Supervisor (SES) who shall have extensive experience (at least 5 years experience is required) in environmental management, supervision and monitoring on construction projects
Construction contractor	The Contractor will be required to be compliance to the EMP prepared for the resettlement site. In addition, it is required that the Contractor get all permissions for construction (traffic control and diversion, excavation, labor safety, etc) following current Vietnamese regulations. The contractor shall be required to appoint a competent individual as the contractors on-site Safety and Environment Officer (SEO) who will be responsible for monitoring the contractor's compliance with the EMP requirements and the environmental specifications.
Local Authority and Community	Organize and facilitate community participation in environmental monitoring and supervision during the construction of the resettlement sites.
Independent Monitoring consultant	Provide support to PMU to establish and operate environmental management systems, offers suggestions for adjusting and building capacity for relevant agencies during the implementation period and monitor the Contractor's EMP implementation plan in both construction and operation stages. IMC will also be responsible to support PMU to prepare monitoring reports on EMP implementation and submit these reports to DONRE for approval.
Hai Phong Department of Natural Resources and Environment (DONRE)	Be responsible for receiving and verifying the environmental monitoring reports submitted by PMU. When problems arise, DONRE will participate directly in research and treatment related issues, minimize the damage arising from the project.
Hai Phong Transport Department	Combine with Hai Phong DONRE to examine regularly contractor activities according to project's agreed requirements
District Division of Natural Resources and Environment (An Duong, Kien An, Le Chan, Hai An)	Monitoring inspection activities to ensure safe environment within the project area of district. Inspection and handling violations. Guidance and training for local officials about responsibility for environmental management at local level. Periodic reports to DONRE on the arising environmental issues. Coordinate with stakeholders, to participate in research, investigation, solving arising environmental problems

Agency/Unit	Responsibility
Resettled households	Manage contractors to ensure that appropriate mitigation measures applicable during the construction of individual/group of houses.

Environmental Duties of the Contractor

The Contractor, his sub-contractor and employees shall adhere to firstly try to minimize the impact that may result of the project construction activities and secondly, the mitigation measures set down in these EMP to prevent harm and nuisances on local communities, impacts in construction and operation on the environment. The duties of the Contractor and his Sub-Contractors include but not limiting to:

Compliance with relevant legislative requirements governing the environment, public health and safety;

Work within the scope of contractual requirements and other tender conditions;

Organize representatives of the construction team to participate in the joint site inspections undertaken by the SES;

Carry out any corrective actions instructed by the EMD or the SES;

Provide and update information to the Environment Team regarding works activities which may contribute, or be continuing to the generation of adverse environmental conditions;

In case of non-compliances/discrepancies, carry out investigation and submit proposals on mitigation measures, and implement remedial measures to reduce environmental impact;

Stop construction activities which generate adverse impacts upon receiving instructions from the EMD or the SES. Propose and carry out corrective actions and implement alternative construction method, if required, in order to minimize the environmental impacts; Major non-compliance by the Contractor will be cause for suspension of works and other penalties until the non-compliance has been resolved to the satisfaction of the EMD.

The Contractor shall be required to appoint a competent individual as the Contractor's on-site *Safety and Environment Officer (SEO)*. The SEO must be appropriately trained in environmental management and must possess the skills necessary to transfer environmental management knowledge to all personnel involved in the contract. The SEO

will be responsible for monitoring the Contractor compliance with the EMP requirements and the environmental specifications. The duties of the SEO shall include but not be limited to the following:

Carry out environmental site inspections to assess and audit the Contractors' site practice, equipment and work methodologies with respect to pollution control and adequacy of environmental mitigation measures implemented;

Monitor compliance with environmental protection measures, pollution prevention and control measures and contractual requirements;

Monitor the implementation of environmental mitigation measures;

Prepare audit reports for the environmental monitoring data and site environmental conditions;

Investigate complaints and recommend any required corrective measures;

Advise the Contractor on environment improvement, awareness and proactive pollution prevention measures;

Follow the procedures in the EMP and recommend suitable mitigation measures to the Contractor in the case of non-compliance. Carry out additional monitoring of noncompliance within the specified timeframe instructed by the EMD;

Liaison with the Contractor and EMD on all environmental performance matters; and Contractor's submission of EMP Implementation Plan reports to the EMD, SES, and relevant administrative authorities, if required;

Keep detailed records of all site activities that may pertain to the environment.

Environmental Supervision by Construction Supervision Engineer

During construction, the environmental supervision shall be carried out by a qualified Construction Supervision team (CST) reporting to the PMU. The CST is responsible for inspecting, and supervising all construction activities to ensure that mitigation measures adopted in the EMP are properly implemented, and that the negative environmental impacts of the project are minimized. The CST shall engage sufficient number of qualified staff (e.g. Environmental Supervision Engineers) with adequate knowledge on environmental protection and construction project management to perform the required duties and to supervise the Contractor's performance.

The Environmental Engineers shall be led by a *Workplace Safety and Environment Supervisor (SES)* who shall have extensive knowledge and experience (at least 5 years experience is required) in environmental management, supervision and monitoring on construction projects to provide, objective and professional advice to the client on the environmental performance of the project. The SES shall be familiar with the environmental legislatives requirements of the Socialist Republic of Viet Nam. Depending on the project requirements, the SES may be required to work full-time on-site.

The SES shall:

Review and assess on behalf of the PMU whether the construction design meets the requirements of the mitigation and management measures of the EIA and EMP,

Supervise site environmental management system of Contractors including their performance, experience and handling of site environmental issues, and provide corrective instructions;

Review the EMP implementation by the Contractors and Sub-Contractors, verify and confirm environmental supervision procedures, parameters, monitoring locations, equipment and results;

Report EMP implementation status to PMU and prepare the environmental supervision statement during the construction period; and

Approve invoices or payments.

Independent Monitoring Consultant (IMC)

In order to minimize the environmental impacts during construction of the Road Project, the project proponent shall ensure that Project-specific monitoring and audit requirements are established for the project. The monitoring and audit shall be carried out by an Independent Environmental Monitoring Consultant (IMC) appointed by DOT.

IMC will be responsible for carrying out environmental sampling and monitoring twice a year, on all environmental-related issues regarding the Contractor's works. IMC will check, review, verify and validate the overall environmental performance of the project through regular inspections and review. This review will provide confirmation that the reported results are valid and that the relevant mitigation measures and monitoring program provided in the Project EMP are fully complied with. He/she will also supply specialized assistance to PMU and EMD in environmental matters.

5.3 Monitoring Program

5.3.1 Objectives

Environment monitoring program have the following objectives:

- Determine the actual extent of the impacts;
- Control impacts which are generated from construction process and mentioned in EIA report;
- Check environmental pollution standards applied to the project during construction;
- Check and supervise implementation of environmental protection solutions during construction based on EIA report.
- Suggest mitigation measures in case of unexpected impacts;
- Suggest to the Client to coordinate with central and local environmental organizations to solve pending issues relating to environmental protection under the scope of the Project;
- Assess the effect of mitigation measures in pre-construction, construction and operation stages;
- Confirm the impacts forecasted in the EIA.

5.3.2 Site inspections

The SEO and the SES shall carry out a monitoring program on a daily or as needed basis at the designated monitoring locations and the regular site inspections. The monitoring program shall include:

- Monitoring of the noise level at the sensitive receptor by portable monitoring kit; the monitoring shall take place during the heavy construction activities, such as excavation, piling, material transportation and night time construction, if any shall be conducted near villages, schools, and other sensitive receptors surrounding the resettlement sites;
- Visual inspection to check the air-borne dust, during demolition, bulk material handling and storage, transportation near the villages;
- Visual inspection to check the water quality in the receiving rivers, fish ponds and lakes affected by the construction activity such as turbid, smell, color, fish kills,

etc. particular at the receiving areas of the water bodies from the construction sites and construction camps.

- During the peak construction period or at the request from PMU, the IMC shall also carry out additional measurements using hand-held equipment in order to monitor short-term impact. Once non-compliance with environmental quality performance criteria is identified, additional monitoring shall be carried out.

The SEO and the SES shall make reference to the following information/documentation in conducting the inspection:

- The contractor's environmental performance, and EMP for resettlement sites;
- Good practices and general environmental mitigation measures;
- Compliance with the EMP requirements, contractual specification and Vietnamese legislation;
- Protection to sensitive locations and control mechanism of the restricted areas;
- The contractor's construction methodologies and condition of construction plant;
- Works progress and program;
- The adequacy and efficiency of the contractor's pollution control measures/treatment facilities for minimizing environmental impacts;
- Landscaping and soil erosion controls;
- Previous site inspection results.
- The Contractor shall update the SEO and the SES with all relevant information of the construction contract to carry out the site inspections. The inspection results and its associated recommendations on improvements to the environmental protection and pollution control works shall be timely submitted to PMU and the Contractor for reference and for taking immediate action.

5.3.3 Monitoring indicators

Environmental monitoring will be implemented during construction and operation process at 3 levels:

- (i) Monitoring the level of compliance with mitigation measures.
- (ii) Community- based monitoring;
- (iii) Monitoring environmental parameters

Monitoring indicators on compliance of mitigation measures

Monitoring assignments of Contractor, CMC and IMC will be clearly indicated in their terms of reference and Contract documents will be approved by World Bank. CMC will be responsible to submit monthly reports which states environmental problems, actions and updated monitoring results. Based on monthly reports and field monitoring trips, IMC will be responsible to prepare and submit semi-annual report to PMU for making conclusions on environmental problems and the key implemented mitigation measures. Quarterly reports will comprise of the following:

A priority list is determined in monitoring report of last month.

Methods taken by Contractor for solving arising problems.

Pending matters, proposed solutions and explanation in force majeure

IMC will provide necessary technical support and guidance to PMU and CMC during implementation of mitigation measures and for relevant reports.

Community-based Monitoring

The communities will monitor the project along its construction process in order to ensure that the contractors will comply with all environmental and social regulations as well as to reduce the risks on their properties and economic activities, human health and the environment. The environmental specifications for contractors include a Community Relations and Communication program that will address all interactions between the Contractors and the community and allow for complaints from the communities to be addressed in a timely manner. A Community Monitoring Group will be established to act as an interlocutor with Contractors.

Environmental quality monitoring parameters

The environmental monitoring program will be implemented during the pre-construction stage (environmental baseline); construction stage and operation stage (the first year of project execution). In addition to the daily inspections and noise monitoring to be carried out by the CST and SEO, the IMC will carry out periodic monitoring with sampling and laboratory analysis as shown in Table 37.

Table 37: Environmental Monitoring Requirements

No	Observation item	Pre-construction phase	Construction phase	Operation phase
I	Noise and vibration			
	1. Parameters	Leq, vibration	Leq, vibration	Leq, vibration
	2. Frequency	Once before construction, at 17 places	Once/06 months at 17 places	Once/06months at 17 places
	3. Standard:	VS 5949: 1998, VS 6962:2002		
II	Air quality			
	1. Parameters	TSP, CO, NO ₂ , SO ₂ , PM10, microclimate parameters	TSP, CO, NO ₂ , SO ₂ , PM10, microclimate parameters	TSP, CO, NO ₂ , SO ₂ , PM10, microclimate parameters
	2. Frequency	Once before construction, at 17 places	Once/06 months, at 17 places	Once/06months, at 17 places
	3.Applicable standard:	NTR 05:2009 and NTR 06:2009		
III	Surface water quality			

No	Observation item	Pre-construction phase	Construction phase	Operation phase
	1. Parameters	pH, DO, BOD ₅ , COD, Total Coliform, E.coli, TSS, turbidity, NH ₄ , NO ₃ , PO ₄ , Fe.	pH, DO, BOD ₅ , COD, Total Coliform, E.coli, TSS, turbidity, NH ₄ , NO ₃ , PO ₄ , Fe.	pH, DO, BOD ₅ , COD, Total Coliform, E.coli, TSS, turbidity, NH ₄ , NO ₃ , PO ₄ , Fe.
	2. Frequency	Once before construction, at 17 places	Once/06 months, at 17 places	Once/06months, at 17 places
	3. Compared standard:	NTR 08:2008-MONRE; NTR 14:2008-MONRE;		
IV	Underground water quality			
	1. Parameters	COD, pH, Total solid waste, Total Coliform, E-Coli, Mg, Fe, Cl	COD, pH, Total solid waste, Total Coliform, E-Coli, Mg, Fe, Cl	No impact
	2. Frequency	Once before construction, at 17 places	Once/06 months, at 17 places	
	3. Compared standard:	NTR 09:2008-MONRE		
V	Soil quality			
	1. Parameter	As, Cd, Cu, Pb, Zn	As, Cd, Cu, Pb, Zn	no impact
	2. Frequency	Once before construction, at 17 places	Once/06 months, at 17 places	
	3. Compared standard:	NTR 03:2008-MONRE		

Note: In operation stage monitoring within 1 years in resettlement areas

5.3.4 Monitoring reports system

Table 38: Environmental Monitoring reports system

No	Report	The First report level	The second report level	The third report level
Construction phase				
1	Environment Current status report for resettlement	Implement Unit: Contractor Report frequency:	Implement Unit: PMU Report frequency: 06months/once	Implement Unit: PMU Report frequency: 06months/once

No	Report	The First report level	The second report level	The third report level
	areas	Monthly Send report to: PMU	Send report to: Department of Natural Resources and Environment	Send report to: WB
2	Implement Environment management plan	Implement Unit: Contractor Report frequency: 03 months/once Send report to: PMU	Implement Unit: PMU Report frequency: 06months/once Send report to: Department of Natural Resources and Environment	Implement Unit: PMU Report frequency: 06months/once Send report to: WB
3	Monitoring Health, safety, Environment and Traffic	Implement Unit: Monitoring consultant Report frequency: 03 months/once Send report to: PMU	Implement Unit: PMU Report frequency: 06months/once Send report to: Department of Natural Resources and Environment	Implement Unit: PMU Report frequency: 06months/once Send report to: WB
Operation phase				
1	Environmental management and monitoring plan and safety in operation for resettlement areas	Implement Unit: urban management officer-commune PC Report frequency: 03 months/once Send report to: Local Leader (commune)	Implement Unit: local authority Report frequency: 06months/once Send report to: District PC	Implement Unit: District PC Report frequency: yearly Send report to: city PC

5.3.5 Cost Estimation

5.3.5.1. Cost for implementation of mitigation measures

Following regulations of Vietnamese Laws, Contractor must ensure abiding with the following four HSET criteria: Health for Community (Health); Site Safety (Safety); Environmental Sanitation (Environment) and Transport Management (Transportation).

The cost for organization, training, dissemination, procurement, operation of equipment, and manpower for implementation of mitigation measures in and out of the site in accordance with HSET requirements are integrated in construction package. Contractors will be responsible to study, prepare alternatives and offer cost estimation for these

activities. It is considered as one of the criteria for assessing the capability of the Contractor in the future and compliance level of the Contractor.

In case of violations, the Client can impose penalties or hire another unit to participate in solving arising problems.

5.3.5.2. *Monitoring cost*

- Cost of monitoring and supervision by Construction Supervision Consultant team (CST)

The Bidders of Construction Supervision packages under resettlement works of Hai Phong Urban Transport Development Project will include the costs of environmental monitoring and supervision during construction phase as part of his bid price.

- Cost for community-based monitoring

According to regulations of Vietnamese laws, the participation of community monitoring system will be primarily in voluntary mode without any assistance cost. Community monitoring organizations will receive assistance from project management unit through capacity building programs and provided with necessary documents, papers and forms to facilitate site supervision works. However, practical experiences show that it is difficult to maintain monitoring work over a long period at high intensity. In order to increase the effectiveness, the community monitoring team should be provided with a certain allowances. The cost of community monitoring system is presented below.

Table 39: Prepared operating community supervision system support cost
Units: VNĐ

Duración	Number of resettlement sites	Number of community staff per area	Monthly Allowance	Total
Within 30 months	12	1	200,000	72,000,000

- Monitoring cost of Independent Monitoring Consultant (IMC)

Project management unit will have a contract with independent monitoring consultant during construction process of the resettlement sites. IMC will implement assignments of all project components which follow TOR.

The estimation cost for Consultant (excluding monitoring and training cost) during construction process will be 900,000,000 (nine hundred million dong round) for implementation within 2.5 year period.

- Implementation cost of monitoring program

Based on prepared monitoring program, operating monitoring program cost is presented below:

Table 40: Cost Estimation of Environmental Parameters Monitoring

Criteria	Unit price 1000d	Pre-construction stage		Construction stage (within 2.5 years as expected)		Operation stage (within 3 years as expected)		Total of sample	Total amount VND
		times	places	times	places	times	places		
Surface water									138,720,000
pH	30	1	17	5	17	6	17	204	6,120,000
TSS	50	1	17	5	17	6	17	204	10,200,000
Turbidity	50	1	17	5	17	6	17	204	10,200,000
DO	60	1	17	5	17	6	17	204	12,240,000
COD	70	1	17	5	17	6	17	204	14,280,000
BOD ₅	80	1	17	5	17	6	17	204	16,320,000
NO ₃ ⁻	50	1	17	5	17	6	17	204	10,200,000
PO ₄ ⁻	60	1	17	5	17	6	17	204	12,240,000
NH ₄	50	1	17	5	17	6	17	204	10,200,000
Fe	60	1	17	5	17	6	17	204	12,240,000
E.Coli	60	1	17	5	17	6	17	204	12,240,000
Total coliform	60	1	17	5	17	6	17	204	12,240,000
Ground water									38,760,000
pH	30	1	17	5	17			102	3,060,000
TS mg/l	50	1	17	5	17			102	5,100,000
COD mg/l	70	1	17	5	17			102	7,140,000
Cl ⁻	50	1	17	5	17			102	5,100,000
Fe	60	1	17	5	17			102	6,120,000
Total Coliform (MPN/100ml)	60	1	17	5	17			102	6,120,000
E.Coli (MPN/100ml)	60	1	17	5	17			102	6,120,000

Criteria	Unit price 1000d	Pre-construction stage		Construction stage (within 2.5 years as expected)		Operation stage (within 3 years as expected)		Total of sample	Total amount VND
		times	places	times	places	times	places		
Noise, Vibration									15,300,000
Led	30	1	17	5	17	6	17	204	6,120,000
Vibration	45	1	17	5	17	6	17	204	9,180,000
Exhaust									61,500,000
PM10 ($\mu\text{g}/\text{m}^3$)	50	1	17	5	17	6	17	204	10,200,000
Suspended soil ($\mu\text{g}/\text{m}^3$)	50	1	17	5	17	6	17	204	10,200,000
NO ₂ ($\mu\text{g}/\text{m}^3$)	50	1	17	5	17	6	17	204	10,200,000
SO ₂ ($\mu\text{g}/\text{m}^3$)	50	1	17	5	17	6	17	204	10,200,000
CO ($\mu\text{g}/\text{m}^3$)	50	1	17	5	17	6	17	204	10,200,000
Microclimate element	50	1	17	5	17	6	18	210	10,500,000
Soil									134,640,000
Cu	80	1	17	5	17			102	8,160,000
Pb	80	1	17	5	17			102	8,160,000
Zn	80	1	17	5	17			102	8,160,000
Cd	80	1	17	5	17			102	8,160,000
As	100	1	17	5	17			102	10,200,000
residual pesticide	900	1	17	5	17			102	91,800,000
Total									388,920,000
Contingency									61,080,000
Total									450,000,000

Total estimated cost for implementation of a monitoring programmed is 450,000,000 VND (four hundred and fifty million dong total). For the purpose of effective implementation, the monitoring program implementation can be combined with the contract established with IMC.

5.4. Capacity buildings activities

Table 41: Proposed Training Activities t

Training topics	Subject to be trained	Number of trainees	Training time	Trainer	Estimated costs
Workplace safety and environmental sanitation	Contractor's workers and technical staff	All workers and staff on site	Within 4 weeks of construction commencement	Contractor Safety and Environmental Safeguard Officer	Included in contract price
Environmental management during construction phase of civil works	Hai Phong PMU Staff Construction supervisors	5 PMU staff and one representative of each contractor of resettlement contracts	At least four weeks before construction is commenced		20,000,000
Community participatory Environmental Monitoring	Volunteers in the project area	12 RS x 10	Within One week before construction	IMC consultant team	24,000,000
Total					44,000,000

5.5. EMP Total Cost estimation

Apart from costs, which have been calculated in relevant packages/contracts, one more cost element will be required for EMP as follows:

Table 42: Total cost for environmental management plan

Contents	Cost (VND)
Cost for operation of community monitoring system	72,000,000
Cost for Independent Monitoring Consultant	900,000,000
Cost for monitoring program implementation	450,000,000
Cost for capability building and training	44,000,000
Cost for risk/incident respond	300,000,000
Total	1,766,000,000

The above cost rate is estimated based on current unit price and Consultant's experiences. Because the project will be implemented over many years, price fluctuation will be unavoidable. A contingency amount should be prepared for any unavoidable price or cost increase during project implementation.

ANNEX

Annex 1 Pictures of community Consultation



Community consultation at Bac Son, An Duong district



Community consultation at Le Loi, An Duong district



Community consultation at Dang Cuong, An Duong district



Community consultation at Hong Thai, An Duong district



<p>Community consultation at Dong Thai, An Duong district</p>	<p>Community consultation at Dong Hoa, Kien An district</p>
 <p>Community consultation at Vinh Niem, Le Chan district</p>	 <p>Community consultation at Dang Hai, Hai An district</p>
 <p>Community consultation at Nam Hai, Hai An district</p>	 <p>Community consultation at Trang Cat, Hai An district</p>

Annex 2 - Samples of Community Consultation Records

Letter from Bac Son CPC requesting compliance with RAP and EMP commitments during implementation

ỦY BAN NHÂN DÂN XÃ BẮC SƠN

Số 78 /UBND

V/v: Tham gia ý kiến cho dự án "Phát triển
giao thông đô thị thành phố Hải Phòng"

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập - Tự do - Hạnh phúc

Bắc Sơn, ngày 4 tháng 7 năm 2010

Kính gửi: Ban Quản lý Dự án khu vực các công trình giao thông vận tải

Sau khi nhận được Công văn số 187 ngày 7 tháng 7 năm 2010 của Ban Quản lý Dự án khu vực các công trình giao thông vận tải về việc tham vấn ý kiến cộng đồng cho dự án "Phát triển giao thông đô thị thành phố Hải Phòng" (hợp phần xây dựng các khu tái định cư phục vụ giải phóng mặt bằng cho dự án phát triển giao thông đô thị thành phố Hải Phòng), UBND xã Bắc Sơn, huyện An Dương có một số ý kiến trả lời như sau:

Hợp phần xây dựng các khu tái định cư khi được hoàn thành sẽ góp phần cải thiện cơ sở hạ tầng thành phố Hải Phòng, cải thiện điều kiện sống của người dân trong khu vực, phần nào giải quyết được nhu cầu nhà ở của người dân trong vùng, từng bước cải thiện điều kiện môi trường tự nhiên tại khu tái định cư và phù hợp với quy hoạch phát triển kinh tế xã hội của huyện An Dương cũng như của thành phố Hải Phòng.

Tuy nhiên, trong quá trình triển khai dự án, UBND xã Bắc Sơn đề nghị Ban Quản lý Dự án khu vực các công trình giao thông vận tải thực hiện đúng kế hoạch hành động tái định cư và các biện pháp giảm thiểu tác động đến môi trường cũng như kế hoạch quản lý môi trường do bên tư vấn đưa ra.

Cuối cùng, UBND xã Bắc Sơn mong muốn dự án cũng như hợp phần xây dựng các khu tái định cư triển khai đúng tiến độ để sớm đưa vào sử dụng phục vụ cho nhân dân thành phố Hải Phòng.

Xin trân trọng cảm ơn./.

TM.UBND XÃ BẮC SƠN



KT. CHỦ TỊCH
PHÓ CHỦ TỊCH

Lê Quốc Hưng

CỘNG HOÀ XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc

BIÊN BẢN THAM VẤN CỘNG ĐỒNG
DỰ ÁN PHÁT TRIỂN GIAO THÔNG ĐÔ THỊ THÀNH PHỐ HẢI PHÒNG

Cuộc họp được tiến hành vào hồi 8 giờ ngày 12 tháng 3 năm 2010 tại Nhà văn hóa xã Hải Sơn thành phố Hải Phòng.

Về dự án: **Phát triển giao thông đô thị thành phố Hải Phòng** (Hợp phần: Xây dựng các khu tái định cư phục vụ giải phóng mặt bằng cho dự án phát triển giao thông đô thị thành phố Hải Phòng).

Tổ chức họp tham vấn nhân dân: Phổ biến thông tin và tham vấn cộng đồng về dự án "Phát triển giao thông đô thị thành phố Hải Phòng" (Hợp phần: Xây dựng các khu tái định cư phục vụ giải phóng mặt bằng cho dự án phát triển giao thông đô thị thành phố Hải Phòng):

- Phổ biến thông tin về dự án
- Các chính sách giải phóng mặt bằng, đền bù và di dân tái định cư của Ngân hàng Thế giới, của Chính phủ Việt Nam và của UBND thành phố Hải Phòng
- Các tác động đến môi trường tự nhiên và xã hội của dự án

Thành phần tham dự:

✓ Đại diện UBND xã/phường:

1. Lê Quốc Trung Chức vụ: CT xã Hải Sơn
2. Lê Quốc Tú Chức vụ: Cán bộ địa chính
3. Nguyễn Việt Minh Chức vụ: Cán bộ địa chính

✓ Đại diện các tổ chức chính trị xã hội:

1. Nguyễn Đại Hải Chức vụ: CT HĐND
2. Hoàng Thị Bé Chức vụ: CT UBND xã
3. Chức vụ:
4. Chức vụ:
5. Chức vụ:

✓ Đại diện Ban QLDA khu vực các công trình giao thông vận tải, Hải Phòng:

1. Phan Thanh Thảo Chức vụ: Giám đốc QLDA
2. Vũ Anh Tuấn Chức vụ: Giám đốc QLDA
3. Chức vụ:

✓ Đại diện đơn vị tư vấn:

1. Ông Nguyễn Thanh Trường Chức vụ: Trưởng phòng chuyên môn
2. Chức vụ:
3. Chức vụ:

✓ Người dân trong xã/phường tham gia:

Tổng số người tham gia: 44 người

Trong đó: Nam: 18 người chiếm 40,9%

Nữ: 26 người chiếm 59,1%

Đã tiến hành tham vấn cộng đồng về dự án: "Phát triển giao thông đô thị thành phố Hải Phòng" (Hợp phần: Xây dựng các khu tái định cư phục vụ giải phóng mặt bằng cho dự án phát triển giao thông đô thị thành phố Hải Phòng)

Chủ tọa cuộc họp: Ông Nguyễn Thanh Trường

Chức vụ: Trưởng phòng chuyên môn

Nơi công tác: Trung tâm Nghiên cứu Môi trường - Viện Khoa học Khí tượng Thủy văn và Môi trường

Nội dung tham vấn:

Ông/Bà: Ông Nguyễn Thanh Trường nêu nội dung cuộc họp tham vấn

1. Phổ biến thông tin về dự án

a. Dự án Phát triển giao thông đô thị thành phố Hải Phòng

- Phổ biến thông tin về mục tiêu, mục đích, quy mô của dự án

- Kế hoạch triển khai dự án

- Những mặt thuận lợi và khó khăn của dự án

- Những tác động tích cực mà dự án mang lại

b. Hợp phần xây dựng các khu tái định cư phục vụ giải phóng mặt bằng cho dự án phát triển giao thông đô thị thành phố Hải Phòng

- Mục tiêu, mục đích, nhiệm vụ khi thực hiện dự án
- Hiện trạng các khu tái định cư
- Tình hình dân cư bị ảnh hưởng và hưởng lợi
- Hạng mục công việc khi xây dựng
- Thiết kế sơ bộ của dự án

2. Chính sách đền bù, di dân tái định cư

- Các tác động của thu hồi đất trong dự án
- Quy trình thực hiện thu hồi đất và giải phóng mặt bằng
- Các chính sách đền bù, di dân tái định cư của Ngân hàng Thế giới, của Chính phủ Việt Nam và của UBND thành phố Hải Phòng
- Sự tham gia và giám sát của cộng đồng trong các giai đoạn của dự án

3. Các tác động đến môi trường tự nhiên và kinh tế xã hội

- Các tác động của dự án đến kinh tế - xã hội và môi trường trong các giai đoạn chuẩn bị, xây dựng và vận hành của dự án
- Các chính sách an toàn, các biện pháp bảo vệ môi trường sẽ được áp dụng khi triển khai dự án

Tham vấn cộng đồng:

Sau khi nghe đại diện tư vấn nêu những thông tin về dự án, các vấn đề đền bù và di dân tái định cư, mọi người trong cuộc họp đã thảo luận về các nội dung:

1. Các chính sách giải phóng mặt bằng, đền bù và di dân tái định cư
2. Các vấn đề về môi trường và các biện pháp giảm thiểu tác động đến môi trường của dự án
3. Tham gia của cộng đồng trong các giai đoạn của dự án

Kết quả tham vấn: Tóm tắt ý kiến của cộng đồng địa phương

1. Vấn đề liên quan đến đền bù và di dân tái định cư

- Dân số... báo... khi... thiết... quy... phân... hợp... với... địa...
...hình... chung... và... địa... phương... báo... khi... quy... báo...
...sát... vấn... là... liên... lý... với... người... địa... công... bất... và...
...sân... sát... sang... tại...
- Diện... tích... đất... còn... lại... không... còn... nữa... nữa... các...
...hình... máy... máy... còn... lại... bị... phá... và... người... công... cấp...

nhỏ... năm... , không SX được nữa... là đưa... đất
đi... tạo... lại... lại...

- Nhà... được... 100 - 150m...
đam... nước...

- Area... bị... đi... đất...
cấp... T.D.C... đất... Mặt...
như... mà... 60m...
đam... thì... nước...

- Ng... bị... đất...
đam...

- UBND... đất...
đam... SX... thì...
đam... SX... (V.D...
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thì... đất...
thì... đất...
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2. Vấn đề liên quan đến môi trường

- Đã có khu TĐL QL 10, khu này đang có hiện tượng thất bại khu TĐL ra ngoài mà chỉ có tầng trên là khu TĐL nên hạn chế việc xây dựng tầng dưới tầng hầm khi xây dựng cần tăng cường quản lý và giám sát khi XD để đảm bảo không ảnh hưởng đến môi trường. Tránh như đường QL 10 có nhiều ô nhiễm sắt thép, vật liệu giăng dơ làm ô nhiễm nghiêm trọng. Cần có hệ thống thoát nước của khu TĐL.
- Khu công nghiệp An Dương có quy mô lớn (tại thành phố Hải Phòng), khu này đang hệ thống thoát nước bên cạnh đường đã bị phá vỡ nhiều khi làm cần có hệ thống thoát nước của người dân để phục vụ dân sinh sống, quy hoạch theo quy mô của nhà nước nhằm giảm bớt việc ô nhiễm môi trường không ảnh hưởng đến quyền lợi của người dân sinh sống. Cần hệ thống tiêu thoát nước khi thi công xây dựng công trình.
- Các hệ thống thoát nước không phải do nhà thầu

mà phải đã ban PLDA nghiên cứu trước và sẽ báo
pháp hai phía giải báo trước để cho người dân
- có thể gây ở nhà mà không. Nếu mà bị bị
bất tiện. Yêu cầu khi xây dựng sai thì sẽ
thứ đợc và viết lại thời phải chịu trách nhiệm
khi thi công cũng sửa bị hỏng, không có đường
thoát thì biết lúc ai
- UBND - Khu TĐC để nghiên cứu đường điện, hệ thống
trên thoát nước cấp nước, điện biết nhà ở dân cư
điện hiện sống, phải có khu công viên, cây xanh
xây dựng khu TĐC nên không làm tái trạng
tính, hiện thoát hệ thống quản lý và SX công
nghiệp và phải XD lại kết CSHT không làm ảnh hưởng
đến T, nên cần đất SX công nghiệp thì phải phân bổ tập thể
SX được không làm sai tập mặt bằng xây dựng và
XH và khu vực

3. Vấn đề liên quan đến sự tham gia của cộng đồng địa phương

Sẽ tiến hành tham gia bằng các giải pháp của
dự án

Tất cả người dân tham gia cuộc họp đều bày tỏ nguyện vọng tha thiết trong việc
xây dựng các khu tái định cư để người dân ổn định cuộc sống, tạo điều kiện phát triển
cơ sở hạ tầng. Tuy nhiên cần thực hiện nghiêm túc trong việc đền bù cho người dân và
trong quá trình xây dựng các khu tái định cư.

Cuộc họp kết thúc vào hồi: 10h 15 ngày 12 tháng 7 năm 2010

Annex 3: ENVIRONMENTAL MANAGEMENT OF CONSTRUCTION ACTIVITIES IN RESETTLEMENT SITES

General

1. The Contractor and his employees shall adhere to the mitigation measures set down in these specifications to prevent harm and nuisances on local communities, and to minimize the impacts in construction and operation on the environment.
2. Remedial actions which cannot be effectively carried out during construction should be carried out on completion of the works (and before issuance of the acceptance of completion of works):
 - (a) All affected areas should be landscaped and any necessary remedial works should be undertaken without delay;
 - (b) water courses should be cleared of debris and drains and culverts checked for clear flow paths;
 - (c) All sites should be cleaned of debris and all excess materials properly disposed;
 - (d) Borrow pits should be restored.

Construction Activities and Environmental Rules for Contractors

Prohibitions

The following activities are prohibited on or near the project site:

- Cutting of trees for any reason outside the approved construction area;
- **Hunting, wildlife capture;**
- Use of unapproved toxic materials, including lead-based paints, asbestos, etc.;
- Disturbance to anything with architectural, cultural or historical value;
- **Use of alcohol by workers during working hours.**

Transport

- The Contractor shall use selected routes to the project site, as agreed with the Project Engineer, and appropriately sized vehicles suitable to the class of roads in the area, and shall restrict loads to prevent damage to local roads and bridges used for transportation purposes.
- The Contractor shall be held responsible for any damage caused to local roads and bridges due to the transportation of excessive loads, and shall be required to repair such damage to the approval of the Project Engineer.
- The Contractor shall not use any vehicles, either on or off road with grossly excessive, exhaust or noise emissions. In any built up areas, noise mufflers shall be

installed and maintained in good condition on all motorized equipment under the control of the Contractor.

- Adequate traffic control measures shall be maintained by the Contractor throughout the duration of the Contract and such measures shall be subject to prior approval of the Project Engineer.

Workforce and Camps

- The Contractor should, whenever possible, locally recruit the majority of the workforce and shall provide appropriate training as necessary.
- The Contractor shall install and maintain a temporary septic tank system for any residential labor camp and without causing pollution of nearby watercourses.
- The Contractor shall establish a method and system for storing and disposing of all solid wastes generated by the labor camp and/or base camp.
- The Contractor shall ensure that site offices, depots, asphalt plants and workshops are located in appropriate areas as approved by the Project Engineer and not within 500 meters of any existing residential settlements, watercourses and are operated so that no pollutants enter watercourses, either overland or through groundwater seepage. This will require lubricants to be recycled and a ditch to be constructed around the area with an approved settling pond/oil trap at the outlet.

Waste Management and Erosion Control:

Solid and hazardous wastes must be properly controlled, through the implementation of the following measures:

- Minimize the production of waste that must be treated or eliminated.
- Dispose in authorized areas all of garbage, metals, used oils, and excess material generated during construction, incorporating recycling systems and the separation of materials.
- Control drainage through the construction areas
- Apply erosion control measures before the rainy season begins preferably immediately following construction. Install erosion control measures as each construction site is completed.
- In all construction sites, install sediment control structures where needed to slow or redirect runoff and trap sediment until vegetation is established. Sediment control structures include windrows of logging slash, rock berms, sediment catchment basins, straw bales, brush fences, and silt
- Control water flow through construction sites or disturbed areas with ditches
- Spray water on dirt roads, cuts, fill material and stockpiled soil to reduce wind-induced erosion, as needed

Maintenance

- Ensure that all equipment maintenance activities, including oil changes, are conducted within demarcated maintenance areas; never dispose spent oils on the ground, in water courses, drainage canals or in sewer systems.
- All spills and collected petroleum products shall be disposed of in accordance with standard environmental procedures/guidelines. Fuel storage and refilling areas shall be located at least 300m from all cross drainage structures and important water bodies or as directed by the Engineer.

Earthworks, Cut and Fill Slopes

- All earthworks shall be properly controlled, especially during the rainy season.
- The Contractor shall complete cut and fill operations to final cross-sections at any one location as soon as possible and preferably in one continuous operation to avoid partially completed earthworks, especially during the rainy season.
- In order to protect any cut or fill slopes from erosion, in accordance with the drawings, cut off drains and toe-drains shall be provided at the top and bottom of slopes and be planted with grass or other plant cover. Cut off drains should be provided above high cuts to minimize water runoff and slope erosion.
- Any excavated cut or unsuitable material shall be disposed of in designated disposal areas as agreed to by the Project Engineer.
- Disposal sites should not be located where they can cause future slides, interfere with agricultural land or any other properties, or cause soil from the dump to be washed into any watercourse. Drains may need to be dug within and around the tips, as directed by the Engineer

Stockpiles and Borrow Pits

- Operation of a new borrowing area shall be subject to prior approval of the Project Engineer, and the operation shall cease if so instructed by the Project Engineer. Borrow pits shall be prohibited where they might interfere with the natural or designed drainage patterns. River locations shall be prohibited if they might undermine or damage the river banks, or carry too much fine material downstream.
- The Contractor shall ensure that all borrow pits used are left in a trim and tidy condition with stable side slopes, and are drained ensuring that no stagnant water bodies are created which could breed mosquitoes.
- Rock or gravel taken from a river shall be far enough removed to limit the depth of material removed to one-tenth of the width of the river at any one location, and not to disrupt the river flow, or damage or undermine the river banks.
- The location of crushing plants shall be subject to the approval of the Engineer, and not be close to environmentally sensitive areas or to existing residential settlements, and shall be operated with approved fitted dust control devices.

In any borrow pit and disposal site, the Contractor shall:

- Identify and demarcate locations for stockpiles and borrow pits, ensuring that they are 15 meters away from critical areas such as steep slopes, erosion-prone soils, and areas that drain directly into sensitive water bodies
- Limit extraction of material to approved and demarcated borrow pits.

- Stockpile topsoil when first opening the borrow pit. After all usable borrow has been removed, the previously stockpiled topsoil should be spread back over the borrow area and graded to a smooth, uniform surface, sloped to drain.
- Excess overburden should be stabilized. Where appropriate, organic debris and overburden should be spread over the disturbed site to promote re-vegetation. Natural re-vegetation is preferred to the extent practicable.
- Existing drainage channels in areas affected by the operation should be kept free of overburden.
- Once the job is completed, all construction -generated debris should be removed from the site.

Disposal of Construction and Vehicle Waste

- The Contractor shall establish and enforce daily site clean-up procedures, including maintenance of adequate disposal facilities for construction debris
- Debris generated due to the dismantling of the existing structures shall be suitably reused, to the extent feasible, in the proposed construction (e.g. as fill materials). The disposal of remaining debris shall be carried out only at sites identified and approved by the Project Engineer. The contractor should ensure that these sites do not impact natural drainage courses. Under no circumstances shall the contractor dispose of any material in environmentally sensitive areas.
- In the event any debris or silt from the sites is deposited on adjacent land, the Contractor shall immediately remove such, debris or silt and restore the affected area to its original state to the satisfaction of the Project Engineer.
- All arrangements for transportation during construction including provision, maintenance, dismantling and clearing debris, where necessary, will be considered incidental to the work and should be planned and implemented by the contractor as approved and directed by the Engineer.

Safety during Construction

The Contractor's responsibilities include the protection of every person and nearby property from construction accidents. The Contractor shall be responsible for complying with all national and local safety requirements and any other measures necessary to avoid accidents, including the following:

- Carefully and clearly mark pedestrian-safe access routes;
- If school children are in the vicinity, include traffic safety personnel to direct traffic during school hours;
- Maintain supply of supplies for traffic signs (including paint, easel, sign material, etc.), road marking, and guard rails to maintain pedestrian safety during construction;
- Conduct safety training for construction workers prior to beginning work;

- Provide personal protective equipment and clothing (goggles, gloves, respirators, dust masks, hard hats, steel-toed and boots, etc.,) for construction workers and enforce their use;
- Ensure that the removal of asbestos-containing materials or other toxic substances be performed and disposed of by specially trained workers;
- During heavy rains or emergencies of any kind, suspend all work.
- Brace electrical and mechanical equipment to withstand seismic events during the construction.

Nuisance and Dust Control

To control nuisance and dust the Contractor should:

- Maintain all construction-related traffic at or below 25 kilometers per hour (kph) on streets within 200 m of the site;
- Maintain all on-site vehicle speeds at or below 10 kph.
- To the extent possible, maintain noise levels associated with all machinery and equipment at or below 90 db.
- In sensitive areas (including residential neighborhoods, hospitals etc.) more strict measures may need to be implemented to prevent undesirable noise levels.
- Minimize production of dust and particulate materials at all times, to avoid impacts on surrounding families and businesses, and especially to vulnerable people (children, elders).
- Phase removal of vegetation to prevent large areas from becoming exposed to wind.
- Spray water as needed on dirt roads, cut areas and soil stockpiles or fill material.
- Apply proper measures to minimize disruptions from vibration or noise coming from construction activities.

Demolition of Existing Infrastructure

- The Contractor shall implement adequate measures during demolition of existing infrastructure to protect workers and public from falling debris and flying objects. Among these measures, the Contractor shall:
 - Set aside a designated and restricted waste drop or discharge zones, and/or a chute for safe movement of wastes from upper to lower levels
 - Conduct sawing, cutting, grinding, sanding, chipping or chiseling with proper guards and anchoring as applicable
 - Maintain clear traffic ways to avoid driving of heavy equipment over loose scrap
 - Use of temporary fall protection measures in scaffolds and outer edges of elevated work surfaces, such as hand rails and toe boards to prevent materials from being dislodged
 - Evacuate all work areas during blasting operations, and use blast mats or other means of deflection to minimize fly rock or ejection of demolition debris if work is conducted in proximity to people or structures

- Provide all workers with safety glasses with side shields, face shields, hard hats, and safety shoes

Community Relations

To enhance adequate community relations the Contractor shall:

- Inform the population about construction and work schedules, interruption of services, traffic detour routes and provisional bus routes, demolition, as appropriate.
- Limit construction activities at night. When necessary ensure that night work is carefully scheduled and the community is properly informed so they can take necessary measures.
- At least five days in advance of any service interruption (including water, electricity, telephone, bus routes) the community must be advised through postings at the project site, at bus stops, and in affected homes/businesses.

Physical Cultural Property Chance-finds Procedures

If the Contractor discovers archeological sites, historical sites, remains and objects, including graveyards and/or individual graves during excavation or construction, the Contractor shall:

- Stop the construction activities in the area of the chance find;
- Delineate the discovered site or area;
- Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the National Culture Administration take over;
- Notify the supervisory Engineer who in turn will notify the responsible local authorities and the provincial Museum immediately (within 24 hours or less);
- Responsible local authorities would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archeologists of provincial Museum or the Institute of Archaeology.
- Decisions on how to handle the finding shall be taken by the responsible authorities and provincial Museum or Department of Culture, Sports and Tourism;

Health Services, HIV/AIDS Education

The Contractor shall provide basic first aid services to the workers as well as emergency facilities for emergencies for work related accidents including as medical equipment suitable for the personnel, type of operation, and the degree of treatment likely to be required prior to transportation to hospital.

Environmental Supervision during Construction

The Project Engineer will supervise compliance with these specifications. Major non-compliance by the Contractor will be cause for suspension of works and other penalties until the non-compliance has been resolved to the satisfaction of the Project Engineer. Contractors are also required to comply with national and municipal regulations governing the environment, public health and safety.