

### 3.3.2 Environmental Impact Assessment for Social Environment

#### (1) Introduction

The Social Impact Assessment and Social Acceptability component of the Environmental Impact Assessment hinges on the process of the stakeholders' full participation in the holistic understanding of the project (construction and operation). This is done in the context of the holding capacities of the affected community's material and human resources, and the possible consequential impacts it will have on the identified stakeholders within their biophysical and sociocultural environment and its mitigating measures. Based on the technical credibility of the project to be environmentally sustainable, it enables the stakeholders and the project implementers to complement each other in the process of adapting these changes towards the enhancement of the quality of life now and in the future of the stakeholders.

#### (2) Methodology

##### 1) The Social Impact Assessment

The household survey was carried out to collect two types of data: socio-cultural and economic characteristics of the residents within the port area and their perception of the project's impact. The data serves as a baseline and basis for formulating recommendation to mitigate adverse impacts.

- a) Socio-Cultural Economic Survey profile of the direct and indirect impact communities was established through secondary data review and the use of a structured questionnaire.
- b) Environmental Impact Assessment and Mitigating Measures

##### 2) The Social Acceptability Process

It generally uses the following strategies and activities.

##### a) Mobilization Phase

- Perception Study using multi-sectoral gender sensitive focus interviews of key-informants and authority figures; focus group interviews of community decision-makers.
- Information, Education and Communication campaign using wall posters, brochures, project description in laypersons language and in the language of the community and proposed project plan were also prepared for dissemination. Likewise, interest group discussion about the nature of the construction and operation of the project.

- Communication Networking with LGU, GOs, NGOs and Pos was done to inform them about their role in the EIA
- b) Community-Based Scoping Workshop
- Presentation of details of project plan: construction, operation and abandonment to the stakeholders
  - Presentation to the stakeholders of the EIA process based on DAO 96-37
  - Results of the workshop are considered in the scope of field assessment of the consultants
- c) Validation Presentation
- The consultants present to the stakeholders the results of their assessment: proposed impacts, mitigations and enhancements in terms of the stakeholders' understanding and language; the stakeholders validate the findings particularly the impacts, the proposed mitigation and enhancement in an open forum. In case of disagreement, the consultant process the results with the stakeholders and/or revalidate findings in the field.
- d) Gender Responsive Community-Based Social Development and Environment Planning Workshop. Convening a facilitating committee made up of the proponent and identified concerned LGU, GOs, NGOs, and POs; DSWD for social and psychological preparation (in cases of relocation), crisis management, credit and livelihood; DA for livelihood, PENRO/CENRO for environment and waste management; DOH for health, safety, sanitation and nutrition; DPWH for infrastructure, PNP for peace and order, DOLE for credit and labor; and the proponent for their commitment to support the resulting plan ; The SDP is done at the project site with the committee facilitating the process, grouped as men, women, youth and elderly and contextualized within their human and material resources ;Upon completion and presentation of the SDP, the stakeholders and the proponent shall sign a covenant of mutual understanding that the latter shall commit and uphold.

### (3) Proposed Cebu Baseport Rehabilitation Project, Cebu City

#### 1) Baseline Social-Cultural and Economic Conditions

##### a) Profile of Cebu City

*The place now called Cebu City first came to be known and seen by the people after the arrival of the Spaniards in Cebu on April 7, 1521.*

The Cebu city was considered important because of its strategic location in the center of Visayas and nearness to Mindanao, from where the Spaniards were able to control or administer them.

It was not until the 19<sup>th</sup> century that Cebu City finally surfaced as an important trading center and central place in southern Philippines. This came after the closing of the galleon trade, which benefited the city of Manila, and the eventual opening of the country to free trade, which encourage the countryside to produce for the export market. Because of its location, Cebu City turned out to be strategic place for consolidating the surplus products from the Visayas and Mindanao.

It was also the intellectual and political capital of the south since the time the first Philippine Assembly was established under the tutelage of the American colonial rulers in 1907 now.

b) **Geographical Location**

Province of Cebu. As defined by the Bureau of Land Location Movement No. 1, Cebu Cadastral Survey, it is 10 degrees 17N latitude and 123 degrees 54E longitude. The Municipality of Consolacion and the City of Mandaue, on the South by the Bohol Strait and on the west by the Municipality of Talisay and the City of Toledo bound it on the north. From outside the province, Cebu City is accessible from all places by air and sea transport.

Cebu City has a total land area of 32, 800 hectares. Its terrain is relatively flat on the coastal plain and becomes rolling and hilly at elevations of 40 to 200 meters and then generally rugged at elevation 200 to almost 800 meters above sea level. Cebu City has a very unfavorable topography, since 80% of its total land area is mountainous. Thus, the City government opted to reclaim foreshore lands for added space.

c) **Demographic Characteristics**

- **Total Population**

As of 1995, the population growth rate of Cebu City is at 2.2% and at year 2000 population projection is pegged at 758,814. However, the inevitable floating or daytime population would further increase the city's population to over a million people.

As of 1995, the total population of Cebu City was 662,299. It is equivalent to 46.1 percent of the total population of Metro Cebu (Compostela to Naga) and 22.7 % of the entire population of the province.

- **Population Density**

In 1995 the population density of the city was 2,370 persons per sq. km, Metro Cebu only had an average density of 19,990 persons per sq km in the same period while the whole province only had 603 persons. The city

actually had a higher average density of 7,753 persons per sq km in its urban area.

The number of households in the city rose to 134,986 in 1995, registering an increase of 20,278 households over the 1990 figure. The average household size declined from 5.3 persons to 4.9 persons over the five-year period.

- **Age-Sex Composition**

Cebu City has more females than males in 1995. The sex ratio of males for every 100 females was 98.0. In 1995, the age-sex structure of the population of the city deviated from the usual pyramid shape. It shows the protrusions at the ages 15 to 24 years.

- **Migration**

From the post war period up to the eighties the population of the city have been growing at a very fast rate due to rapid migration. From 1970 to 1975 the growth rate is 3.54%. This went down to 3.49 % per year from 1975 to 1980 and to 2.22% per year from 1990 to 1995. This finally became 1.54 % from 1990 to 1995, indicating that Cebu City was losing some of its population to near-by Metro towns and cities.

d) **Economy**

Products from the island and those coming from the provinces of Central Visayas and Mindanao are brought to the city for processing and redistribution to other parts of the country. Products manufactured in Manila or imported from abroad are also channeled in Cebu before they are redistributed to the different provinces of the Visayas and Mindanao.

These trading activities have encouraged financial institutions and other trading activities to locate themselves in the city. Allied with the growing trading and financial services in the city is also the growing tourism industry. The growth of tourism is made possible by the presence in the city of many recreation, entertainment and shopping centers. Likewise, the city is known for its rich cultural heritage and history, being the first Spanish settlement in the country.

- **Labor Force and Employment**

Census data in 1995 showed that 73.2 % of the cities employed labor force are found in trade and other related service activities such as banking, real estate, and insurance, community and personal services and others. Some 18.8 % are employed in industry while 7.85% are engaged in agriculture and related activities.

Cebu City has a very high unemployment rate of 16.0% as of 1999. This indicated the slowing down of business after the Asian crisis.

In April 2000 the rate of unemployment in the city declined to 11.5% despite the country's unemployment rate of 13.7 %. This was due to the reduction in the labor force participation rate bringing down the labor force from 340.4 thousand in 1999 to 329.8 thousand in April 2000.

- **Family Income, Expenditures and Savings**

The NSO survey in 1997 indicated that the family income in Cebu City is Ph 163,196 per family. This is 60% higher than the province and almost twice that of the average for the region.

The average family expenditure in the city in 1997 was Ph 114,326. After deducting expenditures, saving per family equals Ph 48,870. This was equivalent to a savings rate of 29.9 %, which was higher than the average savings for the whole region.

Most of the families in the city spend their income for food. This accounted for 44.8 % of the total expenditures in 1997. Housing rent followed this and rental value of occupied dwelling units with 18.1 percent.

Salaries and wages provide most of the family income in the city. 58.8 % of the total number of families in the city received their income in salaries and wages, all coming from non-agricultural activities. Only 27.7 % of the total number of families received their income from entrepreneurial activities, mostly from non-agricultural business. The rest of the families received their income from shares of crops, receipts from abroad, interest on deposits, dividends, gifts, and others.

- **Investments**

Cebu is widely known as the most progressive investment center in the country in Asia. Many foreign investors are attracted to Cebu because of the availability of skilled and educated labor force, strategic location, availability of infrastructure.

Over the past ten years, investments in the province have increased considerably. In 1990 up to the Asian crises in 1997 total accumulated investments in BOI approved projects reached 85.2 billion pesos. This was equivalent to 79.4 percent of the entire investments in Central Visayas or about 4.1 percent of the entire BOI approved projects in the country. Investments in BOI approved projects in Cebu declined after the coming of the Asian crisis in 1997.

- **Foreign Trade**

Traditionally the bulk of Cebu's foreign trade passes through the port of Cebu. Because of the presence of the economic zone in Mactan, about a third of Cebu's exports and imports now passes through the airport in Lapu-lapu City and small volume through Danao City.

From over 600 million US dollars in 1990, total exports from Cebu went up to 1.887 billion in 1997. Despite the Asian crisis Cebu's exports crossed the two-billion dollar mark in 1998 and grew further to 2.4 billion in 1999 leaving a trade balance of more than US 1.4 B dollar.

- **Economic Zones**

There are seven (7) economic zones in Cebu. MEPZ 1 and 2 are government owned while the rest are owned by the private sector. As of 1999, MEPZ 1 and 2 had 129 firms with a total employment of more than 43,000 workers. Although the economic zones are not really located in Cebu City, it provides most of the services and amenities required by the industries in the zone. One of the biggest foreign export firm in Cebu employing more than five thousand workers is located in Danao City.

The former Lahug airport is now being developed into an information and technology center for the city. The 300-hectare south reclamation project is also envisioned by the city to be developed into a new economic zone. When fully developed, the reclamation can easily generate up to 100,000 jobs.

e) **Social Services**

- **Education**

The city has seven (7) universities and sixteen (16) colleges. Various courses from engineering to medicine, arts and sciences, including computer science are offered. The city has a very high literacy rate of 98% as of 1995.

For the SY 1999 - 2000 of the city's total of 307 public and private pre-school, elementary, and high schools with the total enrolment of 196,293, 69% were enrolled in the public schools and the rest in private schools.

- **Health**

The city maintains one (1) tertiary hospital, five (5) urban health units and fifty-two (52) barangay health stations. The city employs one hundred eighty-six (186) government health personnel including twenty-three (23) doctors, thirty-one (31) nurses and sixty-seven (67) midwives assigned in the different barangays of the city.

Presently, the city has eighteen (18) private and government general hospitals with a total capacity of 2,162 beds. Many people from the Visayas and Mindanao come to the city to seek medical assistance or hospitalization making the city the medical capital of southern Philippines.

- **Housing**

The city has 105 developed subdivisions with a total land area of 609.6 hectares divided into 11,830 residential units. Nineteen of the subdivisions are low cost covering 4,198 units in 63.59 hectares land. Condominium housing is fast developing in the city with 26 projects now completed and under construction for 2,344 units.

To meet the need of socialized housing; the city government's DWUP identified a total of 494 hectares of land for housing development in the different parts of the city. The program is expected to benefit 524 homeowners associations with more than 40,000 beneficiary families.

f) **Social Welfare**

The city government has a social welfare program directed at the community, family, women, youth and the disabled, including emergency assistance in certain areas. Almost all barangays have a Day Care Program except for eleven.

The assistance for the poor or economically disadvantage and disabled is focused on livelihood assistance, skills training, job placements and other activities designed to assist them find secure jobs or livelihood.

g) **Protective Services**

At present the city has 11 police stations and 8 fire stations with a force of 452 police and 137 fire personnel, respectively. The ratio is 1: 1,564 for police and 1: 4,719 for fire personnel.

Recorded were 1,907 index and non-index crimes in 1998. Petty crimes including violent ones abound in the city due to poverty. The use of drugs and the commission of drug related crimes.

h) **Infrastructure and Utilities**

- **Land Transportation**

Cebu City is an old city and narrow, circuitous, and poorly connected roads characterize the inner city. Because of urbanization it now becomes expensive to construct new roads or widen the existing roads of the city. It is for this reason that the city is now suffering from traffic problems.

Recent efforts to widen the major thoroughfare of the city have not helped much to lessen the traffic problem due to the city's business activities expanding into commercial areas. The most problematic traffic area is the north-south direction because of the limited number of by-pass roads going to those areas.

- **Sea Transportation**

The Cebu seaport has four (4) kilometers of berthing space with modern facilities to handle general and container cargoes. The city's port serves both domestic and international vessels.

In 1999 the main port of Cebu handled a total of 51,590 calls, handling 7,451,967 tons of cargoes and 10,611,922 passengers. It also handled a total 436,700 twenty-foot equivalent (TEUS) of container cargoes. Foreign vessels carrying a total of 888,000 tons of cargoes for the city's foreign trade made 392 of the ship calls.

- **Air Transport**

The city used to have a domestic airport in Lahug. With the need to expand foreign investment, trade and tourism in Cebu, a new airport was opened in Mactan Island. It is about 15 kilometers from the city center and can be reached in about half an hour using the two bridges connecting the Mactan Island with mainland Cebu.

The airport is of all weather type with modern terminal facilities and concrete runway that can accommodate all kinds of existing aircrafts in commercial use today. It is connected by regular flights to Manila and almost all the airports in the Visayas, Mindanao and other cities of Asia. It is served by all airlines in the country and by almost all the major airlines in Asia.

In 1999 the airport handled a total of 36,065 flights with 2,087,404 domestic and international passengers and 4,398,843 tons of domestic and foreign cargoes. The presence of the international airport have affected for the entry of many foreign tourists in Cebu. The airport has also paved the way for the establishment of export processing zones in Mactan Island.

Most of the output of the foreign export firms that are located in the processing zones in Mactan use the airport for their export and import activities. The airport is also used now by Federal Express as a hub for the handling of its cargoes in Southern Philippines.



i) Communication

Cebu is now served with modern telecommunication systems. There are two land-based telephone companies such as PLDT and ISLACOM, and cellular companies lead by SMART and GLOBE.

- Electric Power Supply

Electrical power is provided by the Visayas Electrical Company (VECO) serving Metro Cebu and neighboring areas. It gets its power from the NPC's Visayas Grid. This power comes from the geothermal power plants in Leyte and Negros and also the thermal plants here in Cebu. The Cebu-Negros-Panay-Leyte-Samar Grid has a total capacity of 977 MW.

Seventy-five of the 80 barangays in the city have already been served by VECO as of the end of 1998, covering 73.6% of the city's households. In 1999 VECO sold a total of 1,073,088-megawatt hours of electricity to 224,171 customers in Metro Cebu.

- Water Supply Capacity

The water need of Cebu is supplied by Metro Cebu Water District (MCWD) covering also Mandaue City, Lapu-lapu City and the municipalities of Liloan, Compostela, Consolacion, Cordova and Talisay. It draws most of its water supply from the underground aquifer through a network of pumping stations including those installed at the Mananga weir. The rest comes from Buhisan Dam, the first source of water of Cebu City built during the American Occupation.

At present MCWD has a rated capacity of over 120 thousand cubic meters per day. Based on record, however, total consumption of water by all types of MCWD customers in Metro Cebu reached 29.9 million cubic meters in 1999. This is equivalent only to the daily consumption of 81.9 cubic meters per day. The difference between water production and consumption is the water loss, representing more than 30% of total rated capacity of MCWD.

The total demand for water in Metro Cebu is about three times the size of MCWD's present supply if all those not presently served by MCWD are considered. To meet the demand, plans are now being made to augment MCWD production capacity through the construction of dams in Mananga and Lusaran or piping them from outside sources. When realized the two dams will add some 200,000 cubic meters of water per day for Metro Cebu.

The high cost of the project, however, is causing the delay in the implementation of the project. Even if both projects are completed, the

demand for water in MCWD's franchised area will still outstrip its supply long before year 2020.

Most of those not presently served by MCWD pump their own water from the underground. The rapid extraction of groundwater has caused the intrusion of saltwater, reaching up the uptown areas of the city.

- **Drainage and Sewerage**

Cebu City has combined drainage and sewerage system. Both rainwater and domestic sewage are conveyed through a single pipeline, culverts or open canal and directly discharged to the creeks, rivers and into the sea. Most of the domestic sewage are untreated and cause pollution in the river and the sea. Most of these systems are clogged with debris or silt that render them useless during heavy rains and cause flooding in many low-lying areas of the city. Many of the city's waterways are also constricted due to the presence of housing settlements along the riverbanks and creeks obstructing the flow of rivers causing them to overflow and flood.

- **Solid Waste**

The city generates a total of 350 tons of solid waste per day, mostly coming from the densely populated areas of the city. These are collected day and night by the city government's fleet of garbage trucks and brought into the Inayawan landfill. The landfill has a capacity of close to 1 million cubic meters but it has remaining life of only 6 to 8 years. A new landfill is needed soon to meet the city's growing volume of solid waste. Unfortunately no alternative site is available in the city. This should be solved in cooperation with the local government units in Metro Cebu as the other cities and municipalities in the city are also experiencing the same problems of the increasing volume of solid waste.

## 2) Results of Socio-Cultural and Economic Survey

### a) Methodology

- **Survey Instrument**

The survey used a 55-item questionnaire. The questionnaire covers 12 areas: respondent's profile, migration and settlement history, perception of the project, housing and utilities, household income and employment, community problems, land resources, coastal resources, perception of environmental situation, health condition, pattern of decision-making and sources of information.

- **Survey Team and Duration**

There were 6 interviewers in the survey team recruited from the site. The interviewers carried out the household survey from 11 to 16 June 2001. The filled-in questionnaires were reviewed and questionable responses were clarified.

- **Area Coverage and Sample Size**

The survey covers the Cebu Baseport area. The port area has four residential sites called as follows: Panaghi-usa, Ober-da-Bakod, Silangan and Escano. These residential portions are not formally part of any barangay because the port-area under its charter is declared as a non-barangay. The port area is estimated to have 1,063 households. The sample size of the study is 104 households. The number of households and sample taken in each residential site are as follows: Panaghi-usa, 108 (10); Ober-da-Bakod, 135, (21); Silangan, 700 (71) and Escano, 20 (2). The total sample size is estimated to have 4% sampling error with reliability level of 95 percent.

The summary results of socio-economic and perception survey for the respondents of base port is presented hereinafter and details are described in Chapter 2.3 of volume 2.

b) **Profile of the Respondents**

- **Demographic Characteristics**

Around 31% of the respondents are male and 69% are female. Except for 2%, all respondents are born outside the port area. The birthplace of 31% is another place in Cebu City. Another 22% are born in Cebu Province but outside Cebu City. Those born in other provinces in the Visayas outside Central Visayas constitute 23 percent. The provinces are Leyte, Samar and Negros Occidental. Only 7% are born in the other provinces in Central Visayas. Those born in Luzon and Mindanao provinces compose 3% and 12%, respectively. The birthplace of the respondents tells that the port area is an in-migration area.

The age of the respondents ranges from 17 to 88 years old. Their average age is 36.7 years. Those who have some high school education constitute 32 percent. The respondents who went to college comprise 14 percent. Only 2% do not have any education. The average number of years they spent in school is 6.4 years or a mean educational attainment of Grade Six of elementary education.

About 62% of the respondents are married. Fertility is high with an average of 3.2 children per household. The respondents are predominantly Roman Catholics at 95 percent.

- **Household Size and Age Composition**

The average household has 5.1 members or the same as the national average. The economically active adults compose 55 percent. The age composition in the port area means that every economically active adult supports one dependent. There are 80 dependents per 100 economically active adults.

c) **Migration/Settlement**

The in-migration into port area is mainly propelled by a pull factor around 68% are attracted by the livelihood and work opportunities spawned by the port. The port offers opportunities in small-scale business operation, portage, transportation services and even petty crimes. Some 7% cite marriage as a reason while 5% say they have no other place to stay.

The preference of 87% of the respondents is to stay in their present residence. Some 14% like to return to their place of origin. The respondents who prefer to be in a place where they can have land tenure and a farm constitute 7%, respectively.

Some 87% of the respondents do not plan to move. Among the minority who plans to move, 40% want to be back in their hometown and 27% is looking for a place with better livelihood opportunities. A place with greater sense of order or a good relocation site is the preference of 13%, respectively. Some 7% just want to be near a port.

d) **Housing Condition and Utilities Usage**

The housing materials used are mostly semi-permanent but few enjoy basic utilities. About 93% of the houses have galvanized iron as roof. Only a few have other type of materials. Most houses make use of wood as walls. The use of concrete and light materials (nipa, cogon and bamboo) is very limited. Wood is also most widely used material for flooring.

The occupant mostly owns the houses in Cebu Port Area. None owns the homelot. The Cebu Ports Authority owns the land in the port area.

Most homes have a floor area between 10 to 15 sq. meters and a one-room affair. The average house has 1.6 rooms. The houses are relatively new with an average age of 12.4 years.

Some 70% of the houses are lighted with electricity. About 22% still rely on kerosene. Kerosene is also used for cooking by 56% of the households. Another 26% use liquefied petroleum gas (LPG) and 18% still rely on wood. None cook their food using electricity. Among the households who use electricity, the average amount they pay monthly is P353.20.

e) Household Income and Employment

Most households have only one member earning for a living. The one-earner households comprise 55 percent. The average number of earners per household is 1.5 persons. About 39% of the households have two income earners. The rest have three or four income earners.

Around 51% are earning salaries and wages. Small-scale business is also a major income source with 22% of the households depending on it as a main one.

About 62% have no secondary income source. The secondary income sources of those who have are mostly trading and store operation (76%) and wage labor (19%). Livestock production is done by 5 percent.

The greatest percentage of households in Cebu Port Area is earning between P 1000 and P 4999 per month. They constitute 76% of the total. About 15% of the total number of households are earning between P5, 000 and 9,999 per month. It can be seen that the disparity in income distribution in Cebu Port Area is not very wide. Among working women, the average earning is P2,393 a month.

f) Community Situation

The top-ranking problem in the community is crime. These include drug use, drug peddling and theft. Crime is mentioned by 35% of the respondents. The absence of land tenure and lack of utilities and services are the second most frequently mentioned problem at 26%, respectively.

Among those who mentioned a problem, 65% say that none has been done about it. Around 26% say some police action has been done. The rest mention about provision of livelihood and seeking government action. The recommendation of 32% is to arrest the criminals including the drug pushers and thieves..

g) Patterns of Decision-making

At the household level, the husband and the wife usually make decision. The more important the decision, the more the couple make the decision together.

The participation of the respondents' households in community-level decision making is seen in the election of barangay officials, attendance in community

meeting and involvement in fiesta preparation. The respondents' households are most active in electing barangay officials. Around 68% have a member who participates in the exercise. But not much participation is given in community meetings. Only 47% have a member who attend these meetings. The preparation for the fiesta gained more participation. Some 52% of the respondents' report that they have a household member involved in such preparation.

h) Sources of Information

The respondents' sources of information are determined by looking at four types of information: such as national events, provincial events, city events and government programs. It is found out that the respondents have an average of two to three sources of information.

Regardless of the type of information needed, the radio and television are relied upon. These sources may be used simultaneously. The source provides information to 63% on national events, 59% on provincial events, 58% on city events and 56% on government programs.

Word of mouth is not a powerful source of information. The preference for the broadcast and print media reflects the highly urbanized character of the port area. The public officials rank high in information on government programs than in any other type of information. But their reach is not high enough to have a wide audience. On government programs, only 30% of the respondents learn about it from government officials.

i) Awareness and Perception of the Project

The awareness rate in Cebu Port Area is high at 66 percent. Main sources of information about the project are the Cebu Port Authority personnel, neighbors and friends, surveyors, construction activities.

Around 67% of the respondents are in favor of the project. Reasons for favoring the project include port improvement; wider berthing area; more ships; better infrastructure and orderly and aesthetically pleasing layout as the improvement; more and better employment and income; it is a common good; improvement of the city and its high potential revenue.

Among the few (31%) who are not in favor, reasons cited include the project's possible adverse impact on their housing and income sources; occurrence of demolition; and deterioration of business.

Among the common issues suggested for considerations in the finalization of the plan are the conduct of consultation and meeting; provision of relocation site;

elimination of criminality in the port area; provision of livelihood; and compensation.

j) Perceived Project Effects

The perceived project impacts by the respondents include cannot foresee any impact; enhancement of the plants; the project has no effect on air, soil and water; will destroy plants and animals; pollution, increase in temperature due to more concrete pavement.

k) Benefits provided by the Base Port

The identified benefits the project can provide at the municipal level are: more and better employment and income; increase of business opportunities; increase of the city's revenue and level of travel safety; more orderly port operation and beautiful environment.

Benefits identified by respondents at the household level are more and better employment and income; generation of business opportunities; chance to own a home through its resettlement component.

l) Negative Effects of the Base Port

At the municipal and provincial level, negative effects of the project identified are adverse impact on livelihood; environmental destruction; fear of demolition and congestion; increase of criminality; increase of accident rate and stricter authority in the port.

At the household level, negative effects mentioned are possible demolition of houses; deterioration of livelihood; possible environmental destruction.

m) Assistance Needed in Relocation

Provisions identified on relocation site include nearness to the port; provided with basic services (e.g., water, electricity, toilet, and roads); relocation paired with compensation; relocation site paired with livelihood; compensation alone; and employment.

n) Preferred Relocation Site

The preferred relocation of the respondents are near Cebu Port Area; close to livelihood sources; anywhere where services are available; within Cebu City and within Cebu Province; and their hometown.

o) Reasons for Choice of Relocation Site

Considerations for relocation of the respondents are livelihood; they have no

choice; close to their relatives; site similar to their present residence; tenure; and presence of services (like water and electricity).

p) **Just and Fair Compensation**

The respondents give a wide range (P10,000 -500,000) of amount that they consider just and fair financial assistance for dislocation. The average amount is P33, 000.00. Only 14% of the respondents refuse to give an estimate. They express preference for a professional appraisal and personal negotiation during acquisition.

q) **Perception on Environmental Conditions**

The survey presented six environmental aspects to the respondents for them to determine the changes that occurred in the past ten years. They note the changes in air quality (56%), plants, seawater quality and fishes (50%).

The environmental aspects that have been degraded relatively are air quality; fishes; and plants and animals. Others say freshwater and seawater quality is lower at present.

Changes in environmental condition are attributed to pollution; wrong behavior of people; man made changes in the physical setting; congestion; poverty; destruction of vegetation and lack of environmental awareness.

Suggestions raised by the respondents to improve environmental condition are cleaning up activities; installation of solid waste management program; enforcement of law; provision of toilet and water; cooperation among citizens; tree planting, calling the attention of authority, discipline and nature protection.

**3) Results of Focus Group Discussion and Perception Interviews**

Tables 3.3.2-1 to 3.3.2-4 enumerates the highlights of the general findings, issues, problems, insights and recommendations raised during the perception interviews with the different stakeholders for the Cebu Baseport Rehabilitation Project.

**4) Results of Scoping Workshop**

The Second Level community-based scoping workshop was held on October 3, 2001 at the Cebu Baseport Passenger Terminal. The stakeholders who participated in the scoping workshop were divided into 3 groups namely: Pier 4 CPVA; Barangay San Roque; and resident representatives. The highlights of issues, problems and concerns and recommendations are summarized in Tables 3.3.2-5 to 3.3.2-7.

The scoping workshop served as a venue for all the issues, concerns and problems of the stakeholders from the area. Clarifications on issues through dialogue with the



proponent were also essential in bringing out in laymans term the activities of project operations and its consequential impacts on the environment.

#### 5) Results of Social Development Planning Workshop

The Social Development action-planning workshop for the impact vendors of the Cebu Baseport was done on October 13, 2001 at the Cebu Port Authority Passenger Terminal from 9 a.m. to 12 p.m. The government line agencies MA, MHO, DECS, DENR and TESDA facilitated the activity. Each of the line agencies presented their mandate and the programs and services they have that would be available to the vendors.

The objective of the SDP is to integrate the socio-economic, cultural and physical needs of the directly impacted vendors in the event the project will be implemented. Based on the mitigations, a Base Port-based gender responsive social development plan was prepared by the officers of the recognized vendors association (SROTTICAM) in coordination with the concerned government line agencies and representative from Cebu Port Authority. This was undertaken to assure the sustainability of the residents' economic activities during the construction and operation of the project.

The SDP covered the various needs of the impacted vendors, which included, (1) Gender responsive livelihood program, (2) Health, Safety & Sanitation, (3) Environment, and (4) Peace and order. The women, men (vendors, porters & trisikad divers) and the youth analyzed their needs and accordingly prioritized them. They formulated the area implementation plan, identified the government agency involved and likewise indicated the cost of implementation.

#### 6) Environmental Impact Assessment and Mitigating Measures

##### a) Environmental Impacts and Mitigating Measures

Summary of Environmental Impact Assessment and Mitigations for the Base Port Rehabilitation Project is shown in Table 3.3.2-9. However, Table 3.3.2-10 presents the matrix of environmental impacts and level of significance at various levels of project development.

##### b) Future Conditions Without the Project

The population size of Cebu City appears to be moving towards stabilization. The declining growth rate that reached 1.5% between 1990-1995 period strongly indicates this trend. This growth rate contrasts with the surging growth rate of other cities and municipalities constituting Metro Cebu. For instance, the population of Lapu-lapu City and Consolacion is growing at 3.5 percent during the same period. The whole Metro Cebu has a population growth of 2.5% per year. The limited expansion area of Cebu City due to mountainous terrain largely stymies population growth. But the city will be still the core of Metro Cebu in the future.

Metro Cebu serves as the center of commerce, industry, finance, tourism and services in an area that stretches from the southern tip of Luzon to the western and eastern tip of Mindanao. The area covers as far as Masbate in the north, Northern Samar in the east, Surigao del Sur in the southeast and Zamboanga del Norte in the southwest. The economic development of Cebu City is linked to this area and vice versa. Because of this linkage, the increasing overload of the existing port will not only affect Cebu City and Metro Cebu but also the entire area using Cebu as its entry port and gateway to the world market.

The continuing growth of the population and production of the area has heavy bearing on the capacity of the port. Such growth means increase in demand for outside goods and services and need to market their own goods and services. Such increase will need more efficient seaport to bring out more products to Metro Cebu and bring in needed goods and services. A limited capacity of the existing port can constrict said increase. The constriction translates to economic costs. The limited capacity of the port also constricts the population's access to services (e.g., schools and hospitals) available in Metro Cebu and inflow of potential investments that provides employment opportunities.

#### (4) Environmental Impact Assessment of Social Environment of the New Cebu Port – Barangay Tayud, Municipality of Consolacion

##### 1) Results of Baseline Socio-Economic and Cultural Conditions

##### a) Profile of Municipality of Consolacion

- History

Consolacion became the an autonomous town in 1871. It is used to be a barrio of Mandaue. In 1920 it became a municipality.

- Geographical Location

Consolacion lies at the eastern side of the Island of Cebu. Consolacion is bordered by Mandaue City at the southwestern side and is flanked by the Municipality of Liloan at the northwest. At its western side is the City of Cebu while its northern tip the Municipality of Compostela bound Consolacion. Its shoreline faces Bohol Strait.

Consolacion has an estimated land area of 42.05 square kilometers. Its largest barangay in terms of land area is Brgy. Tayud with 6.56 square kilometers; this is followed by Brgy. Lanipga with 4.91 square kilometers.

- **Population**

The 1995 population of Consolacion comprised 3.43% of Metro Cebu's population, and 1.68% of the whole Cebu province. It has a relatively higher population growth rate (3.580%) compared to Metro Cebu (2.536%) and the Province (2.060%).

In 1990, Consolacion's total population was 41,270 persons and by 1995, it increased to 49,205. Barangay Tayud has the largest share of population with 13.68% of the total population or 6,732 residents. Brgys followed this. Pulpogan with 6,099.

The current population of 59,779 is projected to increase by as much as 48% by the year 2010 (a pop. of (88,233). Brgy. Tayud has the largest population share of 13.68% followed by Brgys.

The total of 9,996 households in 1995 was projected to increase to 12,144 in the year 2000 and 17,924 by the year 2010. The average household size is 4.92.

The number of males and females in the year 2000 are 29,953 and 29,826 respectively.

The age group of productive population is between the ages of 15 to 64 years old comprising 57.23 %. The young dependency ratio is 69.58 % (below 15 yrs. old); while the old dependency ratio is 5.16% (64 yrs. Above); with a total dependency ratio of 74.74%.

Although Brgy. Tayud has the largest share of population, Barangay Poblacion Occidental is the most densely populated with 139 persons per hectare. Barangay Lanipga, the farthest and remotest barangay with portions located within the protected Cot-cot-Lusaran watershed area, is the most sparsely populated with 2.54 persons per hectare.

The greatest number of the population have finished elementary (44.14%), 11,958 (28.08%) have finished high school and only 6.18% have graduated from college.

- **Health Situation**

There are a total of 163 RHU personnel and auxiliary workers that deliver health services to the municipality. The facilities are a Municipal Health Center and eight (8) Barangay Health Stations (BHS) serving the entire municipality.

The medical personnel ratio to the municipal population as of the year 2000 is: One doctor per the whole population of 59,779; one nurse per the whole population of 59,779;

In 1999, acute respiratory tract infection was the major causes of morbidity the municipality. Most of the illnesses in the area is caused by air-borne and water borne diseases.

Hypertensive disease is the number one killer in the municipality followed by Malignancies (Cancer).

Sanitary Toilet Facilities in majority of the households, comprising 30 %, used water sealed toilet facilities with depository other than septic tanks/sewer system. Those using water-sealed with sewer/septic tanks comprise 23.60 % of the total number of households. Households without toilet facilities still comprised a high 25.60%.

- **Social Welfare**

Existing Situation is that among the program and service by the Municipal Social Welfare Department (MSWD) extended to the different clientele are Self-employment assistance (SEA); Family and Community Program; Women's Welfare program; Child and Youth Welfare programs; Emergency Assistance Program; and, Program for persons with disability and senior citizens.

In 1999, the MSWD's programs and projects were able to reach out and provide welfare assistance to 1,954 beneficiaries.

- **Education**

The Department of Education, Culture and Sports (DECS) provide public schooling through its (16) elementary schools and nine (9) secondary schools.

The total annual enrolment population in the elementary level has been increasing in the past five years, with an average growth rate of 4.5%. However, there are schools with decreasing enrolment such as ANGLAG, Lanipga and Polog.

- **Peace and Order**

The peace and order situation in the municipality is relatively peaceful despite the suspected resurgence of insurgency in nearby municipalities and mountain barangays.

This existing police-population ratio (1:2,135) is substandard compared to the ideal standard of 1:500 of the minimum standard of 1:1,000.

Homicide recorded a total of 19 incidence in the past five years. In the same period, frustrated murder and homicide recorded 15 and 43 cases, respectively.

The past five years records showed an increasing trend in the number of crime increasing by 95.45 % from 1995's 110 cases to 215 cases in 1999.

- **Housing/Shelter**

Urbanization and economic growth of Metro Cebu's cities, namely Cebu, Mandaue and Lapu-lapu, is making lands scarce for residential development within these cities. The proximity of the municipality of Consolacion has become convenient for the residential land requirements of these cities.

There are an increasing number of commercial and industrial establishments, which have contributed to the increasing number of population and households requiring residential space.

Based on NSO census, Consolacion's 1999 household population was 49,205 with 9,996 households; a household size of 4.92 person per household. With a growth rate of 3.97 % the 2000 and 2010 projected population will be 59,779 and 91,736 % respectively.

- **Agriculture and fishery**

Consolacion's land area is approximately 3,900 hectares. Agricultural land is generally classified as marginal, with very shallow to soil and low organic matter content and natural soil fertility. Around 60% of its land area has a slope of more than 35%, which makes it less suitable to cultivation because of its high erosion potential. Around 10% is classified as marginal while more than 60% is not suitable to agricultural production because of the presence of considerable amount of surface rocks, which also reduces the effective farming area.

Despite these conditions, Consolacion is still considered as basically agricultural land. More than 95 % of the barangays are croplands.

Crop production areas increased by 37.5% for 1995's 640 hectares to 880 hectares in 1999. Corn lands increased by as much as 60%, which made possible the increased in production by 95 %. However, its yield still remain 0.90 MT/hectares. This increase in production yield was attributed to intensified vegetable technology.

Consolacion's cropping system is corn-based. There are 16 barangays that still raise corn as basic commodity. It produces yield of 1.0 metric ton per hectare.

Aside from corn, annual crops like vegetable and root crops are produced. Among the root crops are cassava and camote which remarkably exceeds the annual provincial average production per hectare. Among the perennial crops, mango remains as the highest income earner at limited labor input.

Livestock and poultry production in Consolacion is considered an important component of Consolacion's agriculture. Livestock raising, particular cattle, is considered as a backyard undertaking. Cattle are grazed in open grasslands and under the coconut groves. Lamac and Cabangahan produce the most number of cattle per unit area at a ration of at least 9 cattles per hectare.

In 1999, livestock and poultry were able to generate/produce an equivalent meat production of 5,273.67 metric tons.

The annual fish production from marginal fishermen generated 540 metric tons of fish.

- **Commerce**

There are 131 registered business establishments in Consolacion, 43% of which are in the service sector while 20% are retailers, dealers and traders. Only about 17% are manufacturers while 14.5% are into food processing and food production.

The retailers, dealers, traders are located in Poblacion Oriental and Occidental, Casili, and Pulpogan. About 61% of the establishments are in these areas which are identified for residential and commercial use, complemented with agriculture.

The establishments in the manufacturing sector are predominantly located in the industrial zone Barangays Pitogo, Tugbongan, Cansaga, and Tayud. About 68% are found in these barangays.

Seventy-four percent of the establishments in the food processing/production sector are located in Poblacion Occidental and oriental, and Danglag areas, which are reserved for residential and commercial purposes.

- **Industry**

The strategic location of Consolacion makes it a convenient place for industries. Its proximity to Cebu City makes it an easy alternative for business investors. It shares with Cebu City, Mactan, and Mandaue City major infrastructure facilities such as seaports, airport, and telecommunication system.

An abundant water supply is also a major factor why firms are attracted to the area. No major power problems are imminent and almost all the barangays are already energized.

Constraints; Although support infrastructure facilities are already in place, there is still an inadequate garbage disposal system, and a fully efficient drainage system has yet to be installed. The high cost of lands may deter investors from finding suitable locations within the municipality.

- **Environmental Concerns**

- Solid waste disposal system
- Rise in the number of vehicles
- Water pollution problems
- Watershed degradation

b) **Profile of Barangay Tayud, in the Municipality of Consolacion**

- **History**

Today, Tayud is the official name of the Barangay as the result of the Spanish surveyor's forgetfulness.

- **Brief Profile of Brgy. Tayud**

The land area of the barangay is 344,256 hectares with 1,373 households and a total population of 6,629 as of the 1995 NSO increasing to 8,503 in the present and projected to reach 12,072 by the year 2010. The estimated annual income of the barangay Ph 600,000.00 including IRA.

It is classified as Industrial Zone with six (6) shipyards, four (4) rattan & wrought iron companies, 1 stone craft, 7 poultry raising, 1 Meke factory, 7 fishponds and 2 piggeries.

It has a complete elementary school with a total enrollment of 354 and a secondary Barangay school with an enrollment of 626 as of SY 1999 - 2000.

The barangay has one (1) Health Station with two (2) health workers. The MSWD has serviced the barangay with eighty-eight (88) Family Life Education & counseling, fifty (50) supplemental feeding and one (1) day care center.

The barangay has one (1) subdivision, "Marian Village" located in a 4.538 has in 26 lots.

Being the largest barangay in Consolacion, it is a sub-parish with a resident priest and a church. Located also in the barangay are the Missionary Society of the Philippines Seminary and the Contemplative Poor Clare Sisters.

## 2) Results of Socio-economic and Cultural and Perception Survey

### a) Perception Survey

- Survey Instrument

The survey term used a 55-item questionnaire. The questionnaire covers seven areas: respondent's profile, migration and settlement history, perception of the project, housing and utilities, household income and employment, community problems and land resources.

- Survey Team and Duration

There are five interviewers in the survey team recruited from Barangay Tayud. Local interviewers are used due to the following advantages:

- Tap their familiarity with the area's physical lay-out and rapport with the community;
- Enable the residents to attest the accuracy of survey result; and
- Provide a chance to community members to study the community situation.

The interviewers carried out the household survey from 11 to 18 June 2001. The filled-in questionnaires are reviewed and questionable responses are clarified.

- Area Coverage and Sample Size

The survey covered the 10 sitios composing Barangay Tayud. The barangay has 1,370 households. The sample size of the study is 135 households. The estimated number of households and sample taken in each sitio are as follows: Pagutlan, 219 (21); East Binabag, 192 (19); West Binabag, 123 (12); Sun-ok, 137 (14); Libo, 192 (19); Bangkerohan, 82 (8), Tawagan, 192 (19); Bagakay, 110 (11); Bahabaha, 82 (8) and Looc, 41 (4). The total



sample size is estimated to have 6% sampling error with reliability level of 95 percent.

The summary results of the socio-economic and perception survey is shown in the Chapter 7.3 of the Volume 1. Perception survey was included in the survey to determine the feelings and emotions of the identified stakeholders from the site on the proposed project. This aims to attest stakeholders' level of awareness, acceptance or rejection of the project and solicit their initial reaction on the potential impacts of the project in terms of socio-cultural and economic conditions and the physical environment.

b) Profile of the Respondents

• Respondents	Male	42%
	Female	58%
	Age; 20-80, average 45.5, 82% married	
• Place of respondents born	Barangay Tayud	60%
	Within Municipality of Consolacion	12%
	Other Municipality of Cebu	13%
	Outside of the Province, in Central Visaya, Mindanao	15%
• Education of respondents	Elementary level	60%
	High school education	25%
	College education	11%
	No school education	2%
• Households	Male children	53%
	Female children	47%
	Average 3.5 children, 99% predominantly Roman Catholic	

The in-migration into Barangay Tayud is mainly propelled by a pull factor. Some 36% moved to the barangay due to employment and livelihood. The eight industrial firms within the barangay offer both direct and indirect employment. Being part of Metro Cebu, the barangay provides easy access to wide range of the work places.

Although 40% reported that they chose to live in the barangay because of their marriage or relatives, economic factor largely dictated their choice. Other specific reasons given for moving into the barangay are the availability of schools for children and ownership of a property.

The reason for moving in Barangay Tayud	
Livelihood and employment	34%
Barangay as their place of birth and where they grow up	26%
Presence of their family and ancestral roots	25%
Other reasons are their property	2%
Marriage	2%
Liking for the place	4%

The preference of all the respondents is to stay in their present residence. Among the respondents, 99% do not have a plan to transfer residence. The 1-% who plans to move wants to transfer to Mandaue, the city adjacent to Consolacion.

c) Awareness and Perception of the Project

Awareness	In Barangay Tayud	83 %
	Sources of information	Word of mouths
Acceptance	Favor of the project	90 %
	Reason of Acceptance	Employment and income Development of the area and improved Business opportunities Possible increase of barangay income
	Not favoring the project	Possible adverse impact on existing income sources Displacement of fisherfolks Increase of crime against property.

Suggested recommendations with the affected households

Negotiation and compensation  
Conduct consultation and community meeting  
Information dissemination on the project  
Prioritization of residents for employment and livelihood opportunities  
Decision of barangay officials and the fishing ground of fisherfolks

- Possible Project Effects

Perceived project effects identified by the respondents are negative impact on plants and animals in the barangay; pollution; reduction of farmland; drying-up of water sources; and increase in land value.

- Benefits provided by the New Port

The identified benefits at the municipal level that can be derived from the project are employment opportunities; income and livelihood; increase of barangay income; improvement of the standard of living; and generation of business opportunities.

At the household level benefits identified are generation of business opportunities; employment and income; assistance from the project can provide to families; and chance to have a house.

- **Negative Effects of the Newport**

At the municipal and provincial level, most respondents do not see any negative effect of the project. However the negative effects identified are the increase of criminality; generation of garbage; pollution; congestion; and the project would undermine existing livelihood sources.

At the household level, 85% do not see any negative effect of the project. However, negative effects mentioned in the survey are increase of criminality; undermining of livelihood sources; pollution and illness; and demolition.

- **Assistance Needed in Relocation**

About 68% mentioned this type of assistance. A relocation site of their own choice is mentioned by 11 percent. A house and lot on one hand and a livelihood on the other are cited by 6%, respectively. About 4% want both relocation and compensation. Another 4% prefer the combination of livelihood and relocation site. One percent mentioned fishing gears.

- **Preferred Relocation Site**

The respondents' common choice of relocation site include within Barangay Tayud; far from the port; anywhere within Consolacion; anywhere within Cebu. The other choices for relocation site are other provinces; near the port; and just anywhere.

- **Reasons for Choice of Relocation Site**

Considerations for choice of relocation are health and familiarity with the site; far from pollution; similar to their present residence; close to livelihood sources; presence of family and friends; well adjusted to the place; and safety.

- **Just and Fair Compensation**

The respondents give a wide range (P50,000 -5,000,000) of amount that they consider just and fair financial assistance for dislocation. The average amount is P330 to P495. But 70% of the respondents refused to give an estimate. They expressed preference for a professional appraisal and personal negotiation during acquisition. Few respondents who did not give figures in their responses are excluded from the computation of the average.

d) Housing Conditions and Utilities Usage

About 95% of the houses have galvanized iron as roof. Only a few have nipa or bamboo as roof. Around 74% have concrete walls. Wood is the wall of 19 percent. Concrete is also most widely used material for flooring of 84% of the houses. Only 7% use wood. Bamboo is still used for 7% of the houses.

The floor area of the houses has an average of 69.61 sq. meters. The area ranges from 15 to 250 sq. meters. Most homes have a floor area between 30 to 39 sq. meters. Most houses have only two rooms. The average number is 2.3 rooms with a range of one to five rooms. The houses are relatively old with an average age of 17 years.

Some 86% of the houses are lighted with electricity. Only 12% still rely on kerosene. Kerosene is also used for cooking by 10 percent of the households. Another 39% use liquefied petroleum gas (LPG) and 30% still rely on wood. About 4% cook their food using electricity. Among the households who use electricity, the average amount paid monthly is P368.11. For waste disposal, 75% of the households have water-sealed toilet and 11% have flash toilet. Some 10% still do not use a toilet to dispose their waste. The rest have pit type toilets.

e) Household Income and Employment

Number of income earners	Two	39 %
	Three or more	24 %
	One-	37 %
Source of Income	Salaries and wages	60 %
	Business	15 %
	Farming	3 %
	Fishing	5 %
Main income earners	Male	68 %
	Female	32 %

Most households have only one income source. About 63% have no secondary income source.

Secondary income sources	Trading and store operation	34 %
	Services	22 %
	livestock production	19 %
	Craft and home industry	11 %
	Farming	3 %
	Fishing	3 %

Amount of earning per month	Between P 1,000 and P 4,999	48 %
	P5, 000 and 9,999	30 %
	From P10, 000 to 20,000	4 %
	More than 20,000 a month	4 %
	Less than P1,000	4 %

About 45% of the wives are working and their average earning P 3,620 a month

#### f) Community Situation

Top-ranking problem in the community	Drug abuse	48 %
	Lack of employment and livelihood	16 %
	Theft and lack of water.	12 %
	No problem in the community	24 %

#### g) Farming and Fishing Operation

The situation in the limited farming and fishing operation in Barangay Tayud is seen in the municipal situation. Corn is the primary crop in the municipality. The average harvest is 1,100 kilograms per hectare in 1999. There are two to three cropping cycles a year. Mango, coconut and legumes are also planted. The average farmland holding in the municipality is 0.25 hectares. About 67% of the farming households are shareholders or lessee. Livestock raising supplements farming income. In Barangay Tayud, there are 1,945 cattle, 98 carabaos, 20,500 swine and 1,998 goats.

Consolacion has 500 municipal fishers and no commercial fishers.

Tools of fishing	Motorized boat	8 %
	Non-motorized boat	20 %
	No boat	72 %
Municipal fishing ground		348 hectares
Municipality fishpond		88 hectares

The average yield per gleaning session is about one kilo of assorted catch.

#### 3) Results of Focus Group Discussion and Interview with the Key Informants

Different sectors of stakeholders were considered in the FGD and Key Informant

Interviews. Some of the sectors considered include: shipyard owners; CPA employee; religious sector; Barangay Tayud LGU; MPDC; fisherfolks and the women sector. This activity aims to establish the level of knowledge and general perception of the stakeholders from different sectoral point of view on the proposed project. The highlights of the issues, comments, insights, problems and recommendations mentioned by the selected key informants from the project site are summarized in Tables 3.3.2-11 to 3.3.2-17.

#### 4) Results of Scoping Workshop

The community-based scoping workshop was held on October 4, 2001 at the Barangay Chapel. The workshop served as the venue where all relevant issues and concerns and recommendations of the stakeholders were raised in the assembly. These issues and recommendation are documented for consideration of the consultants concerned and show in Tables 3.3.2-18 to 3.3.2-20. The participants during the scoping workshop was subdivided into 3 groups namely shipyard owners; religious sector and fisherfolks; and youth and women sector.

#### 5) Results of Community- Based Social Development Plan

The Social Development action planning workshop for the impact community Barangay Tayud, Municipality of Consolacion was done on October 12, 2001 at the Tayud Barangay Session Hall from 9 a.m. to 12 p.m. The Municipal Development Officer with the government line agencies MA, MHO, DECS, DENR and TESDA facilitated the activity. Each of the line agencies presented their mandate and the programs and services they have that would be available to the community.

The objective of the SDP is to integrate the socio-economic, cultural and physical needs of the directly affected community in the event the project will be implemented. Based on the mitigations, a community-based gender responsive social development plan was prepared by representative multi-sectoral community members in coordination with the concerned government line agencies to assure the sustainability of the residents' life-ways during the construction and operation of the project.

The SDP covered the various needs of the affected community which included,

- Sale or lease of lands where the access road will pass;
- Gender responsive livelihood program,
- Health, Safety, Nutrition & Sanitation,
- Environment,
- Peace and order,
- Education,
- Recreation, and
- Spiritual.

The women, men (fishermen, farmers & tricycle drivers) and the youth grouped themselves and did needs analysis and accordingly prioritized them. They formulated the community implementation plan, identified the government agency involved and likewise indicated the cost of implementation. A plenary session was done wherein each multi-sectoral sector presented their plans. Results of the SDP are seen in Table 3.3.2-21.

6) Environmental Impact Assessment and Mitigating Measures

a) Environmental Impacts and Mitigating Measures

Summary of environmental impact assessment and mitigating measures for the new Cebu port Development Project is shown in Table 3.3.2-22. This table presents the matrix of environmental impacts and level of significance at various levels of project development for the same project.

b) Future Conditions Without the Project

The population of Consolacion in general and Barangay Tayud in particular will continue to grow. In-migration will sustain a high growth because Consolacion serves as an expansion area to accommodate Metro Cebu's industrial, commercial and residential requirements. The number of industries in Barangay Tayud will increase to meet such requirement particularly in shipyard operation. Its location along the strait between Cebu and Mactan Islands will encourage more shipyard enterprises. Shipyard operation will expand as the volume of sea-borne cargo and passengers will increase with population growth, economic expansion and greater need to move around goods and services.

An increase of population means increase demand for services and facilities. The municipal government will need to beef up its capacity to respond for this demand. The revenues that Consolacion will derive from industrial expansion should help it in responding to the demand. However, the increase of population and industrial activities entails the need for more efficient transport facilities. The limited capacity of the existing seaport in Cebu City will constrain economic production. The industries in Consolacion are mainly using the Cebu City seaport to ship out their products and bring in raw materials. The constraint limits the inflow of potential investments that provides employment opportunities.

**Table 3.3.2-1 Results of Interview with the Youth Sector.**

<b>CATEGORY</b>	<b>ISSUES/PERCEPTION</b>
<b>Employment</b>	<ul style="list-style-type: none"> <li>• The rehabilitation of the Base Port will open doors for a lot of income generating enterprises especially for the large portion of settlers within and around the Base Port (e.g. sari-sari stores, vending, stevedoring, trisikad services, etc.)</li> <li>• Capability to support dependents becomes easier with the existence of possible income generating activities in the area.</li> </ul>
<b>Policy Implementation</b>	<ul style="list-style-type: none"> <li>• The strict implementation of CPA on vending and squatting affects the residents not just economically but emotional and psychologically as well as a result of immediate arrests by the port police and regular demolition activities.</li> <li>• Port policies and its implementation are inutile. The implementation becomes failure due to lack of information and dissemination campaign, budget constraints and inapplicability of the policy with the policy benefactors.</li> </ul>
<b>Relocation</b>	<ul style="list-style-type: none"> <li>• Expressed willingness to relocate provided that it's permanent, proximate to their workplace and educational institutions and with the presence of affordable amenities and services</li> </ul>
<b>Social Problem</b>	<ul style="list-style-type: none"> <li>• Prostitution is present in the community which causes health problems associated with the sex trade.</li> </ul>
<b>Proposed Recommendation</b>	<ul style="list-style-type: none"> <li>• CPA should concentrate on policing the thieves in the area rather than arresting vendors who are working in descent manner.</li> <li>• They accept the fact that they are living in a government-owned and private land. Proper information and consultation with them regarding port policies could lessen harassment and unnecessary conflicts (e.g. deliberations, consultations, etc.)</li> <li>• Port policies should be considerate and sensitive enough to the vendors who are earning for their family's subsistence</li> <li>• Relocation activity will be feasible if it is packaged with alternative livelihood opportunities.</li> <li>• The Cebu City Department of Health shall address regular medical consultation with the prostituted women and information on STDs.</li> </ul>

**Table 3.3.2-2 Results of Interview with the Women Sector**

<b>CATEGORY</b>	<b>ISSUES/PERCEPTION</b>
<b>CPA Policy</b>	<ul style="list-style-type: none"> <li>• CPA policy is not friendly with women fixed stall and sidewalk vendors. Port policy limits their selling area. The new port site has fewer potential customers and far from their residence.</li> <li>• The transfer to the new site has affected drastically their sales and profit in general, and worst some were bankrupt.</li> <li>• They fear that thieves take advantage of their goods and belongings due to far distance between their stalls and houses.</li> </ul>
<b>Proposed Recommendation</b>	<ul style="list-style-type: none"> <li>• Aware of the imminent house demolition plan, they requested that proper information and consultation with them be made to avoid conflicts and harassment.</li> <li>• They demanded for a permanent relocation site near the port and with the provision of at least electric and water facilities.</li> <li>• Livelihood project and programs should be given directly to them instead of passing it through the government.</li> </ul>



**Table 3.3.2-3 Results of Interview with the Base Port Vendors.**

CATEGORY	ISSUES/PERCEPTION
Employment	<ul style="list-style-type: none"> <li>Base Port vendors depend solely on port-related job as major source of income for their family's sustenance.</li> </ul>
Residence Tenure	<ul style="list-style-type: none"> <li>The vendors' main problem is the security. They worry about their stall upon demolition.</li> </ul>
Proposed Recommendation	<ul style="list-style-type: none"> <li>The government can buy a vacant lot near the port area and sell to them at affordable price (option 1).</li> <li>They propose a relocation site near the port area where they livelihood and other income generating potentials are present (option 2)</li> <li>The relocation site should possess amenities like electricity, potable water supply, and sanitation system.</li> <li>A good education program or scholarship for children of relocatees is needed to enable their children chart other opportunities other than what the pier provides.</li> </ul>

**Table 3.3.2-4 Results of Interviews with CPA-recognized Vendors (i.e. with ID)**

CATEGORY	ISSUES/PERCEPTION
Limited Designated Selling Territory	<ul style="list-style-type: none"> <li>Those CPA-recognized vendors with fixed sites complaint that the allowed selling site is out-of-the-way for potential passengers/customers.</li> <li>The passenger ships have no fixed docking area which makes it hard for them to locate the assigned passenger vessel as their assigned market territory.</li> </ul>

**Table 3.3.2-5 Results of Scoping Workshop for Pier 4 CPVA**

CATEGORY	PROBLEMS, ISSUES, CONCERNS	RECOMMENDATION
Socio-economic	<ul style="list-style-type: none"> <li>Ships has no permanent docking area which causes confusion among vendors who have designated ships for bending</li> </ul>	<ul style="list-style-type: none"> <li>Make permanent agreement on permanent vending area between the CPA and vendors otherwise give proper information on the docking area of the ships or giving permit to change docking area assigned for vending</li> <li>Both CPA and vendors should abide with the agreement as to the location of vending area.</li> </ul>

**Table 3.3.2-6 Results of Scoping Workshop, Barangay San Roque, SROTTICAM Multipurpose Cooperative**

<b>CATEGORY</b>	<b>ISSUES AND CONCERNS</b>	<b>RECOMMENDATION</b>
<b>Socio-economic</b>	<ul style="list-style-type: none"> <li>• Dislocation of vendors</li> <li>• Disruption of economic activities</li> </ul>	<ul style="list-style-type: none"> <li>• Relocation of vendors</li> <li>• Economic enhancement</li> </ul>
<b>Health and Safety</b>	<ul style="list-style-type: none"> <li>• Absence of comfort rooms</li> <li>• Absence of water supply</li> <li>• No visible uniformed CPA authority</li> </ul>	<ul style="list-style-type: none"> <li>• Provide amenities</li> <li>• Assign uniform CPA police, Maritime Police and Coast Guards</li> </ul>
<b>Environment Air Water Waste Management</b>	<ul style="list-style-type: none"> <li>• Smoke belching</li> <li>• Scattered human feces</li> <li>• Absence of water connection</li> <li>• Absence of proper garbage collection system</li> <li>• No proper information dissemination activity</li> </ul>	<ul style="list-style-type: none"> <li>• Coordinate with LTO</li> <li>• Provide comfort rooms</li> <li>• Construct drainage facilities</li> <li>• Provide water connection with Metro Cebu Water District</li> <li>• Implement effective waste management scheme</li> <li>• Implement Information, Education and Communication strategy</li> </ul>

**Table 3.3.2-7 Results of Scoping Workshop, Resident Groups**

<b>CATEGORY</b>	<b>ISSUES, PROBLEMS &amp; CONCERNS</b>	<b>RECOMMENDATION</b>
<b>Socio-economic</b>	<ul style="list-style-type: none"> <li>• Absence of vending area inside the port</li> <li>• No trisikad waiting area</li> <li>• No place for porters (aguadors and cargadors)</li> </ul>	<ul style="list-style-type: none"> <li>• Provide vending area</li> <li>• Provide area where the trisikad can wait for passengers</li> <li>• Provide area for porters/aguadors</li> <li>• Provide loan for capital of vendors</li> <li>• Livelihood training</li> <li>• Skills training</li> <li>• Relocation with amenities</li> <li>• Medical services</li> </ul>
<b>Health and Safety</b>	<ul style="list-style-type: none"> <li>• Absence of proper sanitation</li> <li>• Absence of proper garbage disposal</li> <li>• Absence of water supply</li> <li>• Absence of proper management system</li> <li>• Presence of drugs addicts</li> </ul>	<ul style="list-style-type: none"> <li>• Provide proper health and sanitation</li> <li>• Provide effective waste management scheme</li> <li>• Police monitoring of drug ushers and pushers</li> <li>• Implement traffic management scheme</li> </ul>

**Table 3.3.2-8 Results of Community-based Social Development Plan, Base-Port, Cebu City, Province of Cebu.**

NEEDS	COMMUNITY IMPLEMENTATION PLAN	GOVERNMENT AGENCY SERVICES	OTHER SOURCE OF SUPPORT	COST ESTIMATE
<b>1. Gender Responsive Base-Port livelihood program</b> <ul style="list-style-type: none"> <li>Men/ Boys <ul style="list-style-type: none"> <li>porters</li> <li>trisikad drivers</li> <li>ship vendor</li> </ul> </li> <li>Women/ Girls <ul style="list-style-type: none"> <li>ship vendor</li> <li>sari-sari store</li> <li>carinderia</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>SROTTICAM Officer to coordinate the livelihood project</li> </ul>	<ul style="list-style-type: none"> <li>City Social Work and Development (CSWD) special projects provides the SELF-EMPLOYED ASSISTANCE KAUNLARAN</li> </ul> <p>The livelihood program involves the provision of an integrated package of social welfare services to the needy family heads, women, and out-of-school youth by enabling them to uplift their economic status. This services capital assistance, social preparation/ capability building technical assistance and other support services. It enhances the capability of community-based credit associations to self-administer a socialized credit scheme of socially and economically disadvantaged individuals, families and groups.</p> <ul style="list-style-type: none"> <li>TESDA for skills training</li> <li>DECS Non-formal education for skills training</li> </ul>	<ul style="list-style-type: none"> <li>CPA for permit to operate</li> </ul>	Ph 500,000.
<b>2. Health &amp; Sanitation</b> <ul style="list-style-type: none"> <li>Toilet facilities for vendors and passenger customer</li> <li>Contagious diseases( including sexually transmitted) from passengers &amp; transient sex workers</li> <li>Unsanitary food preparation and handling</li> </ul>	<ul style="list-style-type: none"> <li>To be managed by SROTTICAM members</li> <li>To be monitored by SROTTICAM and CPVA members</li> </ul>	<ul style="list-style-type: none"> <li>City Health Department</li> </ul>	<ul style="list-style-type: none"> <li>CPA Environment and Safety</li> <li>The different Cargo Handling Operators</li> </ul>	Ph 1M
<b>3. Environment and Safety</b> <ul style="list-style-type: none"> <li>Establish the buffer zone for passenger pedestrians and customers</li> <li>Establish the Multipartite Monitoring Team to monitor the air, water and social environment during the construction and operation of the project.</li> </ul>	<ul style="list-style-type: none"> <li>SROTTICAM member</li> <li>Identified SROTTICAM and CPVA members to be members of the multipartite monitoring team.</li> </ul>	<ul style="list-style-type: none"> <li>Community Environment and Natural Resources</li> <li>DENR Environment and Management Bureau Region 7</li> </ul>	<ul style="list-style-type: none"> <li>CPA Environment and Safety</li> </ul>	Ph 1M
<b>4. Peace and Order</b> <ul style="list-style-type: none"> <li>Drug addicts</li> <li>Prostitution</li> <li>Snatchers</li> <li>Pickpocket</li> <li>Swindlers</li> </ul>	<ul style="list-style-type: none"> <li>SROTTICAM &amp; CPVA members</li> </ul>	<ul style="list-style-type: none"> <li>Philippine National Police <ul style="list-style-type: none"> <li>intensive training in criminal offence detection and citizen arrest methods</li> </ul> </li> <li>Philippine Coast Guards</li> </ul>	<ul style="list-style-type: none"> <li>CPA Police</li> </ul>	Ph 500,000

**Table 3.3.2-9 Summary of Impacts and Mitigation for the Socio-Cultural Component for the Base Port Rehabilitation Project**

SITE	TYPE & DEGREE OF IMPACT	IMPACTS	MITIGATIONS	DURATION
1. BASE PORT, CEBU CITY	HN	1. Dislocation of the vendors' stalls  > Psychological effects on the affected vendors particularly the women, youth and the elderly as they anticipate their relocation	1. A full scale intensified Information, Education & Communication Strategy shall be done i.e. wall comics, brochures, primers, print ads, and community theater to fully inform and disseminate information about the project construction, and operation activities, and the EIA process (CPA and LOU)  2. Creation and Implementation of Social Development Plan which include: a. Enhancement of livelihood and Credit Facilities (DSWD & DECS) b. Infrastructure Development for Health, and Welfare/Social Services (CPA, DSWD & DOH)	Prior to construction operation
	HP/HN	2. Temporary displacement of vendors and store operators, creation of work opportunities	2. Priority granting of permit to operate vending stalls to qualified men & women from the area must be assured according to law	During Construction and Operation
		3. Increase economic activities will increase capacity to support dependents including education, health, home and other social services	3. Generate and implement land and water use zoning plan (City Government and CPA)	During Construction and Operation
	MN	4. Increase vendors, thus increase in population		
	HN	5. Possible accidents during earthmoving or any construction activities	5. Implementation of Safety Procedures i.e. provision of warning signs and protective devices for workers (MMT, DENR & CPA)	During Construction and Operation
	HP	6. Creation of work opportunities for women especially in enterprises and services		During Construction and Operation
	HP	7. Possible unearthing of finds that showcases the City's architectural wealth and history	1. Project management shall make effort to preserve potential archaeological sites by reporting and coordinating with the National Museum  2. Development of port area (architecture, design must be consistent with the historical and cultural properties of within and around the site.	During Construction and Operation

HN High Negative  
MN Medium Negative  
HP High Positive

MP Medium Positive  
LN Low Negative  
LP Low Positive

**Table 3.3.2-10 Summary Matrix of Impacts and Their Level of Significance at Various Stage of Development, Base Port Rehabilitation Project, Cebu City**

PARAMETERS	IMPACT	NATURE	MAGNITUDE
<b>Construction Phase</b>			
Population size	Population may increase if outside workers are used	MN	Significant
Dependency burden	Wages will increase capacity to support dependents	MP	Significant
Education	Wages will increase capacity to get education	MP	Significant
Sex ratio	Outside workers may alter sex ratio in port area population	MN	Significant
Social services	Outside workers increase demand for services	HN/HP	Significant
Health	Outside workers may lower sanitation level; Wages may afford better medical care	MN/HP	Significant
Employment and Income	Temporary displacement of vendors and store operators; Creation of employment and income;	HN/HP	Significant
Women's welfare	Creation of work opportunity for women	LP	Significant
Archeology and culture	Possible unearthing of finds	LP	Minimal
<b>Operation Phase</b>			
<b>Population size</b>	Increase population due increase economic activities	HP	Significant
Dependency burden	Higher income increases capacity to support dependents	MP	Significant
Education	Higher income increase affordability of education	HP	Significant
Sex ratio	Increase in men and women	HP	None
Health	Higher risk of the health and sanitation situation due to increase in population	HP	Significant
Employment and Income	Higher income increases capacity for home improvement. Reduced unemployment and increase in income due to stimulated production and commerce; Encourage inflow of investment creation more employment and income; greater access of world market of port's service area	MP HP/HN	Significant
Women's welfare	Increase in vending opportunities due to increase port activities	HP	Significant
Archeology and culture	Possible catalyst of restoration and revival of Cebu's core area; Showcasing of city's architectural wealth and history	HP	Significant
<b>Abandonment</b>			
Population size	Possible reduction of population near the site	HN	Significant
Dependency burden	Decrease capability to support dependents	HP	Significant
Education	Decrease capability to support education	HN	Significant
Sex ratio	None	NP	None
Social services	Reduced demand for social services	MP	Minimal
Health	Sustained health & Sanitation	MP	Minimal
Employment and Income	Loss of employment and income	HN	Significant
Women's welfare	Sustained vending activities	MP	Minimal
Archeology and culture	Deterioration of the city's core and destruction of the city's archeological wealth	HN	Significant

Note: LN (Low Negative), MN (Medium Negative), HN (High Negative), HP (High Positive), MP (Medium Positive), LP (Low Positive), NP (Not Applicable)

**Table 3.3.2-11 Results of Interview with the Shipyard Owners.**

CATEGORY	ISSUES AND INSIGHTS
<b>Findings</b>	<ul style="list-style-type: none"> <li>Barangay Tayud is classified as an industrial zone by the municipal government of Consolacion. It is the core of business and trade in the municipality.</li> <li>Shipyard is the most vital industry in the municipality which provides revenue to the LGU and employment for the local residents especially to the Barangay.</li> <li>The shipyard business opens the door for other economic opportunities within and outside the port area as many business enterprise sprout as a result of its operations.</li> <li>More than eighty percent (80%) of shipyard workers are from Barangay Tayud.</li> </ul>
<b>Displacement of the Business and Workers</b>	<ul style="list-style-type: none"> <li>Building of international container port would cause displacement of some shipyard owners and workers as well especially those who solely depend on the business as a source of income.</li> <li>If ever the business will be transferred to another area the old workers will not be employed because the priority workers will be the residents of the new site.</li> <li>Relocating the Shipyard business would cost three times of the original amount.</li> <li>Shipyard owners have difficulty valuating their property and business in view of the actual investments and the shipyard's potential for profit.</li> <li>Reclamation of foreshore land will affect the ship repair and ship building industry.</li> <li>Displacement of the business would affect the cargo shipping industry since Tayud-based shipyards maintain a large market in the entire region.</li> <li>The building of the international container port spell progress for the community an additional port in the area</li> <li>Most of the shipyard owners welcome the proposed development of port in the area even if it would affect their business negatively.</li> <li>The site of the proposed port is strategic because the coastal area is facing an open sea.</li> <li>The Shipyard owners expressed assurance of support to the project and promised to be "partners in progress" rather than impediments to the achievement of the goal of the government.</li> </ul>
<b>Recommendations</b>	<ul style="list-style-type: none"> <li>The proposed port development proponent should strike a balance and fair deal with regards to those who will be affected, i.e. a reasonable compensation arrangements</li> <li>Once the proposed development starts, the proponent can utilize the existing structure in their shipyards for economic reasons for both parties.</li> <li>The project proponent should be aware of land and property speculators who might take advantage of the prices which could result to delay of the project.</li> <li>The CPA should inform them about the nature of the project and its proposal for compensation if ever they will be affected by the development.</li> </ul>

**Table 3.3.2-12 Results of Interview with CPA Permit for Private Port Development Division**

REQUIREMENT	PROCESS
<b>Barangay LGU Endorsement</b>	<ul style="list-style-type: none"> <li>• Consultation with the Barangay leaders of the proposed site to inform them about the nature, scope, pros and cons of the proposed port development.</li> <li>• Barangay deliberations on the potential impact (positive or negative) of the project.</li> <li>• If the project is found generally beneficial, the barangay will pass a resolution endorsing the project.</li> <li>• Forward the resolution to the Municipality for further endorsement and support.</li> </ul>
<b>Municipal Permit</b>	<ul style="list-style-type: none"> <li>• Deliberation and review among the municipal council.</li> <li>• If the proposed project is found within the development agenda of the municipality, the port construction would be allowed upon the approval of other government agencies (i.e. DENR, CPA)</li> </ul>
<b>CPA/DENR Permit</b>	<ul style="list-style-type: none"> <li>• CPA/DENR requires copy of barangay and municipal permits</li> <li>• The proponent shall prepare and submit letter of intent detailing the project rationale to the DENR/CPA.</li> <li>• Acquire Environmental Compliance Certificate from DENR</li> </ul>
<b>Permit to Construct</b>	<ul style="list-style-type: none"> <li>• When ECC is issued, the CPA shall approve the permit to construct.</li> <li>• Proponent can start construction of the port</li> <li>• CPA shall monitor the construction to ensure that guidelines set forth in the ECC are followed.</li> <li>• If the proponent violates any provision in the ECC, the CPA can cancel or reprimand the proponent.</li> </ul>
<b>Permit to Operate</b>	<ul style="list-style-type: none"> <li>• Upon completion of construction, project proponent must secure certificate of operation from CPA</li> <li>• CPA shall monitor the port operation continuously to determine adherence and compliance to the CPA-mandate standards.</li> </ul>

**Table 3.3.2-13 Results of Interview With Religious Institutions**

CATEGORY	ISSUES/INSIGHTS
<b>Disruption of monastery atmosphere</b>	<ul style="list-style-type: none"> <li>• The MSP Seminary expressed fear that the proposed port would affect the atmosphere of silence and prayer of the monastery, as well as the religious order's future plans of transforming the monastery into a home for the elderly priests and a cemetery.</li> </ul>
<b>Displacement of houses and livelihood sources</b>	<ul style="list-style-type: none"> <li>• The Poor Clare sisters feared the displacement of houses and livelihood sources of Tayud residents and would eventually lead to degradation of their standard of living.</li> </ul>
<b>Recommendation</b>	<ul style="list-style-type: none"> <li>• The project developer should consult their MSP superiors in Metro Manila for more information and clarification</li> <li>• Negative effects of the port development shall be properly mitigated with proper compensation package for the loss of property of the affected families.</li> </ul>

**Table 3.3.2-14 Results of Interviews with Barangay Tayud Officials.**

CATEGORY	ISSUES/INSIGHTS
<b>Acceptance to the Project</b>	<ul style="list-style-type: none"> <li>The local government of Tayud welcomes the proposed port within their barangay.</li> <li>Urged the project proponent to speed up the operation of the project so that benefits from it will be immediately experienced.</li> </ul>
<b>Identified Positive Impacts</b>	<ul style="list-style-type: none"> <li>The proposed project will be of great advantages to the municipality of Consolacion and the province of Cebu in general.</li> <li>They believe that the proposed development project will spur economic progress within and outside the barangay.</li> <li>The project would increase rate of employment; serves as stimulus for business opportunities; and would enable the barangay increase its income and IRA collection thus allowing them to implement various projects for the barangay.</li> </ul>
<b>Identified Negative Impacts</b>	<ul style="list-style-type: none"> <li>Broadening of business opportunities in the area would mean increase in social costs (i.e. sex trade, drug abuse and maintenance of peace and order situation)</li> <li>Increased in traffic condition during construction; dislocation of residents and noise pollution.</li> </ul>
<b>Recommendations</b>	<ul style="list-style-type: none"> <li>The project proponent and the residents should deliberate potential alternatives to mitigate the undesirable impacts of the project.</li> <li>Provision of livelihood opportunities to the displaced residents.</li> <li>Prioritize the affected people in labor force requirement during project construction and operation.</li> </ul>

**Table 3.3.2-15 Results of Interview with the Municipal Planning and Development Office**

CATEGORY	ISSUES/INSIGHTS
<b>Findings</b>	<ul style="list-style-type: none"> <li>Barangay Tayud is classified as an industrialization area and the DA identified it as the Strategic Livestock Development Zone under the proposed Strategic Agricultural Fisheries Zone.</li> </ul>
<b>Docking Area</b>	<ul style="list-style-type: none"> <li>Absence of docking area for the fisherfolks due to various fishpond lease agreements and foreshore leases.</li> </ul>
<b>Religious Group</b>	<ul style="list-style-type: none"> <li>The presence of religious sectors/groups might be a problem due to its non-acceptance of the project.</li> </ul>
<b>Displacement of Houses and Livelihood</b>	<ul style="list-style-type: none"> <li>Displacement of houses and other properties of the residents might be affected by the proposed development.</li> <li>An unsuccessful story of reclamation project that fails to get social acceptability, which still operates, amplifies the negative connotation of the port project.</li> </ul>
<b>Recommendations</b>	<ul style="list-style-type: none"> <li>Cancellation of foreshore lease applications and inclusion of the port in the municipal development plan is being done to support the project.</li> <li>Money as the sole factor in the compensation package with the affected communities will likely fail its main purpose.</li> <li>The municipal government is willing to assume of the responsibilities of the project but is up to the level of its capacity.</li> </ul>



**Table 3.3.2-16 Results of Interview with the Fisherfolks**

<b>CATEGORY</b>	<b>ISSUES/INSIGHTS</b>
<b>Fishing Condition</b>	<ul style="list-style-type: none"> <li>• Fish catch is dwindling in the last 10 years due to the presence of shipyards in the area.</li> <li>• The decreasing fish catch has severely affected the source of livelihood of fisherfolks families relying on the marine resources.</li> </ul>
<b>Pollution and Destruction</b>	<ul style="list-style-type: none"> <li>• Shipyards contribute to the pollution of marine waters in the form of oil spillage and other shipyard waste materials.</li> <li>• The dynamite fishing practiced by the neighboring towns contribute also to the degradation of fishing ground of the local fisherfolks.</li> </ul>
<b>Identified Benefits</b>	<ul style="list-style-type: none"> <li>• The proposed project will provide added job opportunities for the local residents</li> </ul>
<b>Negative Impacts</b>	<ul style="list-style-type: none"> <li>• Fear of further marginalization and dislocation of the affected families</li> <li>• The benefits of the project will not really trickle down to the fisherfolks since job opportunities will require high educational requirement except for laborers.</li> </ul>

**Table 3.3.2-17 Results of Interview with the Women Residents of Brgy. Tayud**

<b>CATEGORY</b>	<b>ISSUES/INSIGHTS</b>
<b>Findings</b>	<ul style="list-style-type: none"> <li>• Majority of Tayud women are secondary earners and generally performs domestic chores as housewife.</li> <li>• Women access to work is limited, thus they engaged in small-scale vending, sari-sari store, carinderia, and others.</li> <li>• Three cases of wife battering have been filed to the Barangay Human Rights Action for the month of May.</li> </ul>
<b>Problems</b>	<ul style="list-style-type: none"> <li>• Prevalence of domestic violence among women like physical abuse, battering, affects the women residents of Tayud.</li> <li>• Women have limited access to local governmental position in the barangay.</li> </ul>

**Table3.3.2-18 Results of Scoping Workshop, Shipyard Owners**

CATEGORY	ISSUES & CONCERNS	RECOMMENDATION
<b>Physical</b>	<ul style="list-style-type: none"> <li>The building of the New Port might discourage client vessels from entering the shipyards</li> <li>Vessels waiting for berthing spaces might be congested</li> </ul>	
<b>Environmental</b>	<ul style="list-style-type: none"> <li>Possible siltation of the channel might result to inaccessibility of vessels with higher draft to enter</li> </ul>	
<b>Traffic</b>	<ul style="list-style-type: none"> <li>Traffic in the national highway may congest the roads due to the construction activities</li> </ul>	<ul style="list-style-type: none"> <li>Expansion of existing highway and surrounding roads to four lanes should be part of the project</li> </ul>
<b>Lease Agreement and Conditions</b>	<ul style="list-style-type: none"> <li>What are the plans of CPA on the lease holders of government areas surrounding the proposed site as related to their interest and lawful right</li> <li>What are the financial and property compensation concerning leaseholding rights</li> <li>Considering the time frame of construction, what is the remaining period of work pace can the present leaseholders be allowed to enter</li> </ul>	

**Table3.3.2-19 Results of Scoping Workshop, Religious Sector and Fisherfolks**

CATEGORY	ISSUES & CONCERNS	RECOMMENDATION
<b>Incompatible Land Use</b>	<ul style="list-style-type: none"> <li>Their existing structure near the proposed new port is a home to retired and elderly priest, seminarians and a venue for retreats and seminars</li> </ul>	<ul style="list-style-type: none"> <li>All concerns mentioned should be given enough care, proper attention and consideration</li> </ul>
<b>Disturbance and Comfort</b>	<ul style="list-style-type: none"> <li>They are planning to build within the property the ffg: home for the aged of priests; retreat and vacation house; MSP chapel and cemetery; and spiritual center</li> <li>Poor Claire Monastery at the back of the seminary train their postulants and novices in their building</li> <li>The serenity and prayerful atmosphere of the place will be disturbed</li> </ul>	
<b>Environmental Pollution</b>	<ul style="list-style-type: none"> <li>Noise, air and water pollution may occur during construction and operation</li> </ul>	
<b>Socio-economic</b>	<ul style="list-style-type: none"> <li>The construction might affect fish catch of fisherfolks around the place who are dependent on fishing activities</li> </ul>	

**Table 3.3.2-20 Results of Scoping Workshop, Youth, Fisherfolk and Women Sectors**

<b>CATERGORY</b>	<b>ISSUES &amp; CONCERNS</b>	<b>RECOMMENDATION</b>
<b>Socio-economic</b>	<ul style="list-style-type: none"> <li>• Lost of fishing grounds which is the main source of income of most of the people living in the shoreline</li> </ul>	<ul style="list-style-type: none"> <li>• Priority for job employment during construction and operation</li> </ul>
<b>Health &amp; Safety</b>	<ul style="list-style-type: none"> <li>• Increase of criminal activities due to in-migration of workers</li> </ul>	<ul style="list-style-type: none"> <li>• Create a community crime watch which includes the police, residents and LGU officials</li> </ul>
<b>Environment</b>	<ul style="list-style-type: none"> <li>• Air and water pollution</li> <li>• Large volume of garbage</li> </ul>	<ul style="list-style-type: none"> <li>• Legislate and implement local ordinances as preventive measures for possible occurrence of pollution</li> <li>• Proper waste management system</li> </ul>

**Table 3.3.2-21 Community-based Social Development Plan**

NEEDS	COMMUNITY IMPLEMENTATION PLAN	GOVERNMENT AGENCY SERVICES	OTHER SOURCE OF SUPPORT	COST ESTIMATE
1. Sale and/or lease of land where access road will be built	<ul style="list-style-type: none"> <li>• Owner of land</li> <li>• Barangay Chairperson</li> </ul>	<ul style="list-style-type: none"> <li>• LGU</li> <li>• Municipal Assessor</li> </ul>	<ul style="list-style-type: none"> <li>• CPA legal department</li> </ul>	Ph 1,500 /sq.m
2. Gender Responsive Community enhancement and Livelihood Program <ul style="list-style-type: none"> <li>• Men/ Boys               <ul style="list-style-type: none"> <li>➢ Farmer                   <ul style="list-style-type: none"> <li>- Vegetable production</li> <li>- Swine rising</li> </ul> </li> <li>➢ Fishermen                   <ul style="list-style-type: none"> <li>- Fishing gears</li> </ul> </li> </ul> </li> <li>• Women/ Girls/Elderly               <ul style="list-style-type: none"> <li>- Food processing and preservation</li> <li>- Stuff toy making</li> <li>- Garment sewing</li> <li>- Cosmetology</li> </ul> </li> <li>• Men &amp; Women skills training as mechanics, electricians, plumbers, welders &amp; machinist</li> </ul>	<ul style="list-style-type: none"> <li>• Coordinated by the Barangay chairperson</li> <li>• Gender sensitive values education and livelihood management for appropriate implementation of program</li> <li>• Enabling and enhancing of existing organizations</li> </ul>	<ul style="list-style-type: none"> <li>• Local Government Unit for facilitating the program and projects</li> <li>• Municipal Social and Development (MSWD) special projects provides the SELF-EMPLOYED ASSISTANCE KAUNLARAN</li> </ul> <p>The livelihood program involves the provision of an integrated package of social welfare services to the needy family heads, women, and out-of-school youth by enabling them to uplift their economic status. This services capital assistance, social preparation/ capability building technical assistance and other support services. It enhances the capability of community-based credit associations to self-administer a socialized credit scheme of socially and economically disadvantaged individuals, families and groups.</p> <ul style="list-style-type: none"> <li>• TESDA for skills training</li> <li>• MA for organizing the Rural Improvement Club( women ), 4H club ( out-of-school youths)</li> <li>• DECS Non-formal basic literacy and skills education for the illiterate elderly</li> </ul>	<ul style="list-style-type: none"> <li>• CPA Community Relations</li> </ul>	Ph 1 M
3. Health & Sanitation <ul style="list-style-type: none"> <li>• Nutrition education</li> <li>• Water sealed toilets</li> <li>• Waste management</li> <li>• Information, Education &amp; Communication for health &amp; safety as related to the port's construction &amp; operation ( accidents, prostitution, STD)</li> <li>• Information, education &amp; communication for women's health</li> <li>• Provision of a community clinic with doctor, nurse &amp; health workers</li> </ul>	<ul style="list-style-type: none"> <li>• Barangay chair for Health and Sanitation</li> </ul>	<ul style="list-style-type: none"> <li>• Municipal Health</li> </ul>	<ul style="list-style-type: none"> <li>• CPA Environment and Safety</li> </ul>	Ph 2M
4. Environment <ul style="list-style-type: none"> <li>• Establish the buffer zone and rehabilitation of mangrove area</li> <li>• Establish the Multi-partite Monitoring Team to monitor the air, water, terrestrial environment and social environment during the construction and operation of project</li> </ul>	<ul style="list-style-type: none"> <li>• Barangay chair for environment</li> <li>• Organize the multi-partite monitoring team as per DAO-96-37</li> </ul>	<ul style="list-style-type: none"> <li>• Provincial Environment and Natural Resources</li> <li>• Community Environment and Natural Resources</li> <li>• Environment Management Bureau</li> </ul>	<ul style="list-style-type: none"> <li>• CPA Environment and Safety</li> </ul>	
5. Peace and Order <ul style="list-style-type: none"> <li>• Drugs &amp; drug trafficking</li> <li>• Traffic Management</li> <li>• Crimes &amp; criminal offences</li> </ul>	<ul style="list-style-type: none"> <li>• Chief Barangay Tanod</li> <li>• Head, Committee on Human Rights</li> </ul>	<ul style="list-style-type: none"> <li>• Philippine National Police               <ul style="list-style-type: none"> <li>- extensive training in peace, order and traffic management</li> </ul> </li> <li>• Local Government Unit</li> </ul>	<ul style="list-style-type: none"> <li>• CPA Community Relations</li> </ul>	
6. Education <ul style="list-style-type: none"> <li>• Non- formal education for illiterate and out-of-school youths</li> <li>• Additional Day-care services</li> <li>• Additional buildings for Barangay Elementary School</li> </ul>	<ul style="list-style-type: none"> <li>• Barangay Committee on Education, Sports and Culture</li> </ul>	<ul style="list-style-type: none"> <li>• Department of Education, Sports and Culture for Non-formal and Formal Education</li> <li>• Municipal Social Work and Development for Day Care Center</li> <li>• Department of Public Works &amp; Highways for the building of additional school infrastructures</li> </ul>	<ul style="list-style-type: none"> <li>• CPA Community Relations</li> </ul>	
7. Recreation <ul style="list-style-type: none"> <li>• Multi-purpose building for community recreation               <ul style="list-style-type: none"> <li>- Ballroom dancing</li> <li>- Basketball</li> <li>- Volleyball</li> <li>- Parlor games</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Community Committee for Education, Sports and Culture</li> </ul>	<ul style="list-style-type: none"> <li>• Department of Education, Sports and Culture Region 7 Sports and Recreational Program</li> </ul>	<ul style="list-style-type: none"> <li>• CPA Community Relations</li> </ul>	
8. Spiritual <ul style="list-style-type: none"> <li>• Guidance &amp; counseling</li> <li>• Additional structure for chapels in every sitio</li> </ul>	<ul style="list-style-type: none"> <li>• Barangay resident Priest</li> <li>• Barangay Pastoral Council</li> <li>• Couples for Christ</li> <li>• Knights of Columbus</li> <li>• Monastery of Poor Clare</li> <li>• Missionary Priest of the Philippines</li> </ul>	<ul style="list-style-type: none"> <li>• Dioceses of Cebu</li> </ul>	<ul style="list-style-type: none"> <li>• CPA community relations</li> </ul>	Ph500,000

**Table 3.3.2-22 Summary of Impacts and Mitigation for the Socio-Cultural Component for the New Port Development Project, Brgy. Tayud, Municipality of Consolacion (1/2)**

SITE	TYPE & DEGREE OF IMPACT	IMPACTS	MITIGATIONS	DURATION
NEW PORT, Brgy. Tayud Consolacion	HN	<ol style="list-style-type: none"> <li>Disturbance in of the residents' in the impact area <ul style="list-style-type: none"> <li>Psychological effects on the affected families particularly the women, youth and the elderly as they anticipate the of changes that might occur during construction and operation of project</li> </ul> </li> </ol>	<ol style="list-style-type: none"> <li>A full scale intensified <b>Information, Education &amp; Communication</b> Strategy shall be done i.e. wall comics, brochures, primers, print ads, and community theater to fully inform and disseminate information about the project construction, and operation activities, and the EIA process (CPA and LGU)</li> <li>The compensation of land &amp; plants, and disturbance of life-ways within the identified port access road. The payment of disturbance fee shall be done with the affected families through legal means and equitable remuneration (CPA and LGU)</li> <li>Creation and Implementation of Social Development Plan which include: <ol style="list-style-type: none"> <li>Preparation of land acquisition plan that are agreed by all parties involved and should be following DENR and government guidelines on land acquisition. (DSWD, NHA, CPA)</li> <li>The affected farmlands of identified port access road must allow to maintain, sustain and enhance their existing livelihood activities. (DSWD, DA &amp; CPA)</li> <li>The implementation of SDP shall be before the class opening to prepare the children and the parents to adjust to the disruption and pressure of schooling brought by relocation.</li> <li>Alternative livelihood and Credit Facilities (DSWD, DA, TESDA, DECS)</li> <li>Infrastructure Development for Health, Education, Welfare/Social Services and Recreational facilities (CPA, LGU, DPWH, DSWD, DOH, DECS)</li> </ol> </li> </ol>	Prior to construction and operation

**Table 3.3.2-22 Summary of Impacts and Mitigation for the Socio-Cultural Component for the New Port Development Project, Brgy. Tayud, Municipality of Consolacion (2/2)**

SITE	TYPE & DEGREE OF IMPACT	IMPACTS	MITIGATIONS	DURATION
	HP/HN	2. Temporary displacement of fisherfolks and farmers, and creation of work opportunities	4. Priority employment of qualified men & women from the area must be assured according to Labor Law especially the affected families of the fisherfolks and farmers	During Construction and Operation
	MP	3. Wages will increase capacity to support dependents including education, health, home and other social services		
	MN	4. Increase in-migration, thus increase in population	5. Provision of housing and utilities for port workers from outside (other municipalities, provinces)	During Construction and Operation
	MN	5. Increased in population may affect sanitation level	6. Generate and implement land and water use zoning plan (City Government and CPA)	
	MP/MN	6. Increase of land values and taxation rate		
	HN	7. Possible accidents during earthmoving or any construction activities	7. Implementation of Information, Education and Communication Safety Procedures i.e provision of brochures, posters & warning signs and protective devices for workers (MMT, DENR & CPA)	During Construction and Operation
	HP	8. Creation of work opportunities for women especially in enterprises and services		During Construction and Operation
	HP	9. Possible unearthing of <i>finds</i> that showcases the City's architectural wealth and history	8. Project management shall make effort to preserve potential archaeological sites by reporting and coordinating with the National Museum to ensure protection of preservation of the finds (National Museum, Municipality of Consolacion Committee on Culture and History)	During Construction and Operation
			9. Development of port area (architecture, design) must be consistent with the historical and cultural properties within and around the site.	

<b>HN</b>	High Negative	<b>MP</b>	Medium Positive
<b>HP</b>	High Positive	<b>LN</b>	Low Negative
<b>MN</b>	Medium Negative	<b>LP</b>	Low Positive

### 3.3.3 Simulation of Environmental Impact to Seawater

In the IEE scooping, hydrological situation and water quality are listed as the most significant environmental impacts for the construction of the New Cebu Port. The former is a result of topographic changes due to the construction in a water area and it may further cause coastal erosion in case that the port is situated in a zone where sediment transport is notable. The latter is affected both by the construction activities, mainly dredging and reclamation works, and the port operation.

Those impacts were calculated using numerical models. The findings are described here.

#### (1) Changes in Current Direction

##### 1) Methodology

The current patterns of the present situation and after the construction (year 2010) are simulated using a 3-dimensional double layer difference method. The equations used for the calculation are shown below.

Continuity equation:

$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} - \frac{\partial w}{\partial z} = 0$$

Momentum equations:

$$\frac{\partial u}{\partial t} = -\frac{\partial}{\partial x}(u^2) - \frac{\partial}{\partial y}(vu) - \frac{\partial}{\partial z}(uw) + f_0 v + \frac{\partial}{\partial x}\left(v_x \frac{\partial u}{\partial x}\right) + \frac{\partial}{\partial y}\left(v_y \frac{\partial u}{\partial y}\right) + \frac{\partial}{\partial z}\left(v_z \frac{\partial u}{\partial z}\right) - g \frac{\partial \xi}{\partial x} - \frac{g}{\rho} \int \frac{\partial \rho}{\partial x} dz - \frac{1}{\rho} \frac{\partial P_0}{\partial x}$$

$$\frac{\partial v}{\partial t} = -\frac{\partial}{\partial y}(v^2) - \frac{\partial}{\partial x}(vu) - \frac{\partial}{\partial z}(vw) - f_0 u + \frac{\partial}{\partial x}\left(v_x \frac{\partial v}{\partial x}\right) + \frac{\partial}{\partial y}\left(v_y \frac{\partial v}{\partial y}\right) + \frac{\partial}{\partial z}\left(v_z \frac{\partial v}{\partial z}\right) - g \frac{\partial \xi}{\partial y} - \frac{g}{\rho} \int \frac{\partial \rho}{\partial y} dz - \frac{1}{\rho} \frac{\partial P_0}{\partial y}$$

Free surface equation:

$$\frac{\partial \xi}{\partial t} = -\frac{\partial}{\partial z}\left(\int_{-H}^{\xi} u dz\right) - \frac{\partial}{\partial y}\left(\int_{-H}^{\xi} v dz\right)$$

Where

u, v, w : velocity components in the x-, y- and z-directions, respectively

t : time

$\xi$  : elevation of water surface measured from mean sea level positive upward

H : depth of water measured from mean sea level

$f_0$  : Coriolis's parameter

$P_0$  : atmospheric pressure

$\rho$  : density of water  
 $\nu_x, \nu_y, \nu_z$  : viscosity coefficient  
 $K_x, K_y, K_z$  : diffusion parameter

As the input data the results of the tidal observation (Vol. 2, Section 2.1) and the figures shown in "Tide and Current Tables Philippines 2001" are used and the calculated present current pattern was further compared with current observation results.

## 2) Results

The results of the simulation are shown in Fig. 3.3.3-1 through 3.3.3-7. Fig. 3.3.3-1 through 3 show the current pattern in the present situation, Fig. 3.3.3-4 through 6 show the future patterns and Fig. 3.3.3-7 shows the difference in current velocity of the two. The followings are observed from the results:

- At present there is a strong current in the channel between Cebu Island and Mactan Island with the maximum velocity of 50 cm/sec northeastward during a flood tide and southwestward during an ebb tide. At the estuary of Cansaga Bay there is also a strong current at almost the same velocity. In the shallow area of the proposed construction site there is also a very weak current.
- After the construction, the current pattern is almost the same as present. There will still be a flow between the shallow area behind the port area and the outside water, which will flush and exchange the water behind the port daily.
- The influence of the port construction in current pattern is minor. The area where difference of velocity is more than 1 cm/sec (equivalent to 36 cm /hour) is limited to 100 m around the port area. Impact in the coasts in Liloan, Mactan and Cansaga Bay is almost nil.



CURRENT(rising tide):PRESENT ,L-1

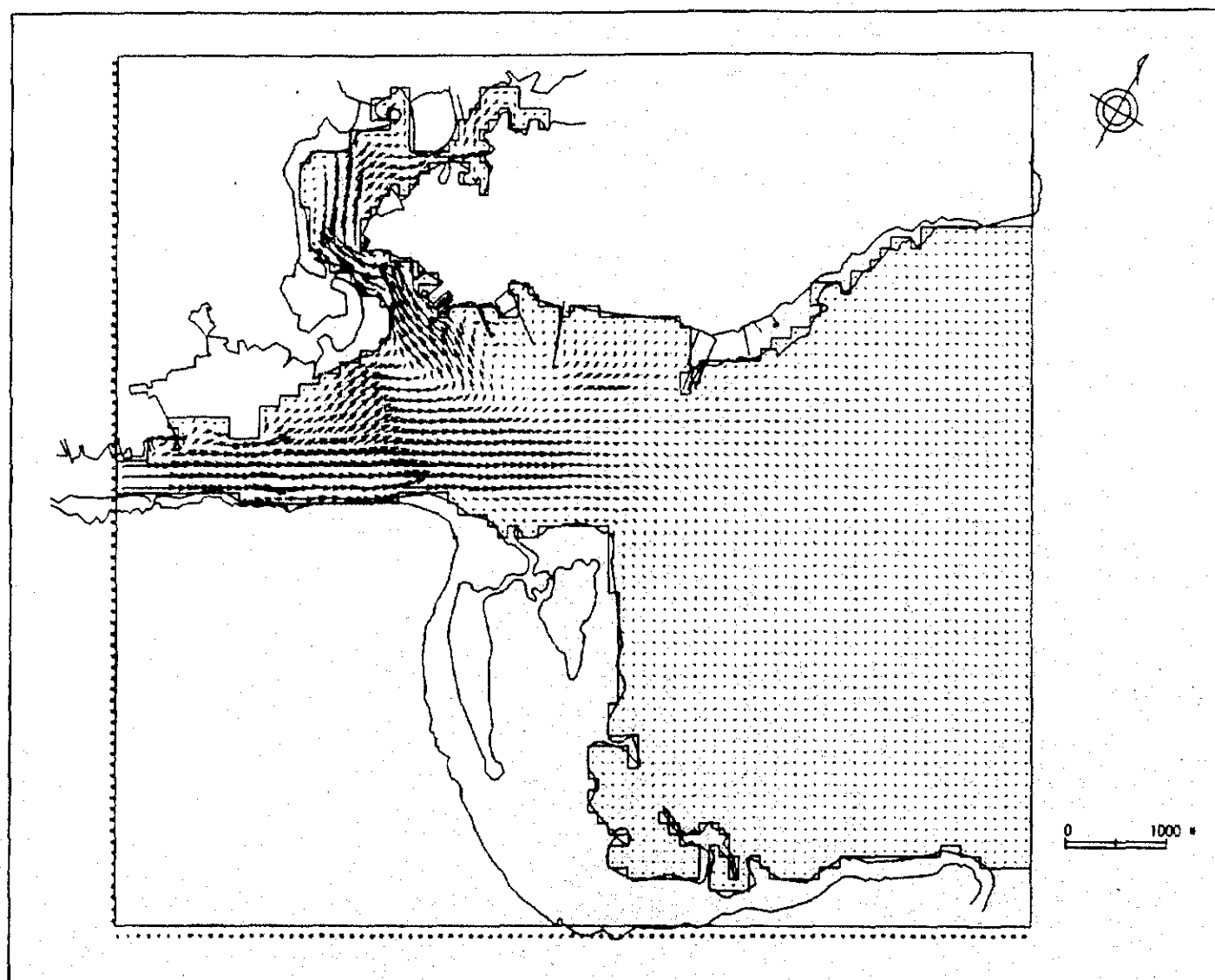


Fig. 3.3.3-1 Current Pattern - Flood Tide, Present Topography

→ 40 cm/s

CURRENT(falling tide):PRESENT ,L-1

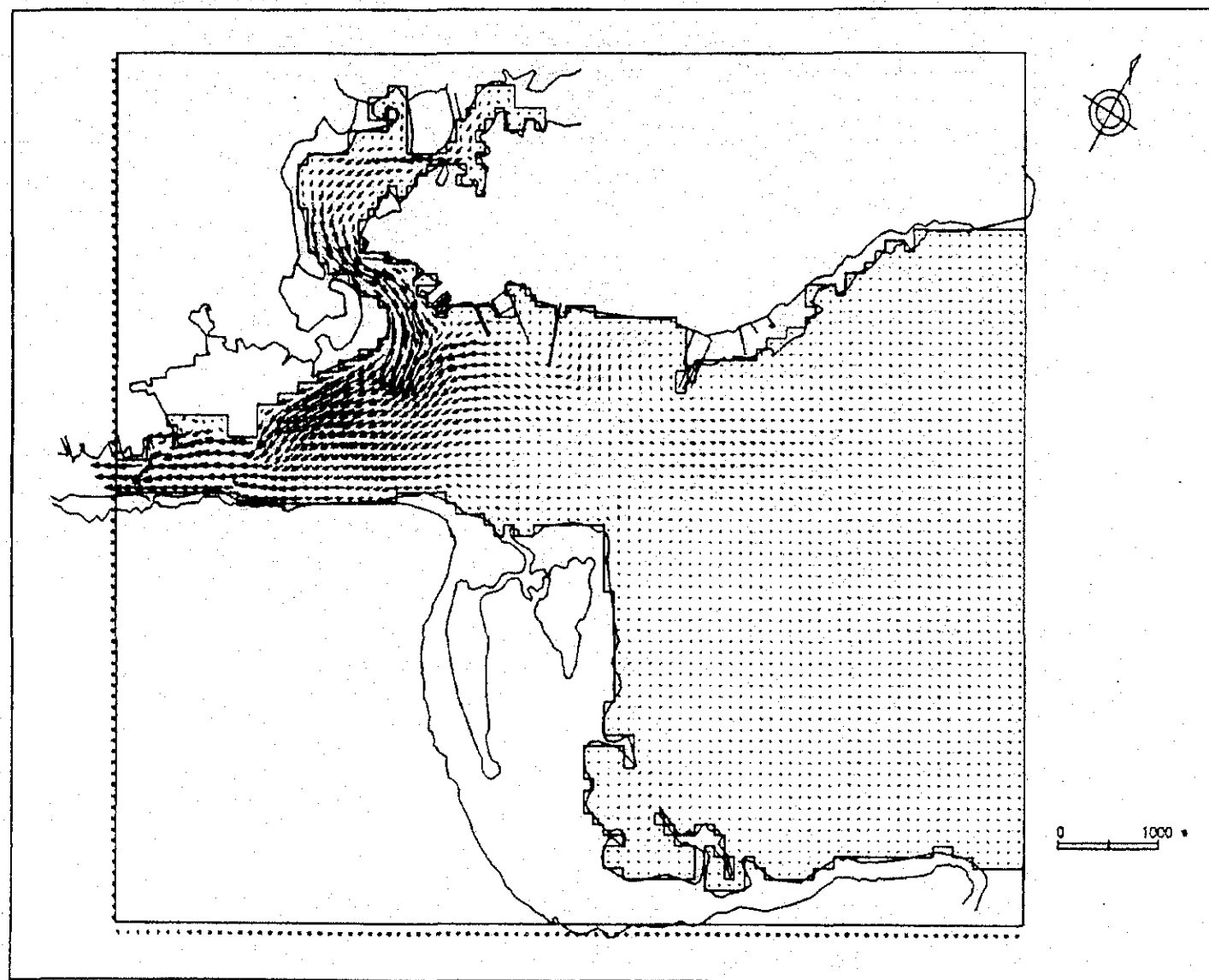


Fig. 3.3.3-2 Current Pattern - Ebb Tide, Present Topography

→ 40 cm/s

CURRENT(RESIDUAL):PRESENT ,L-1

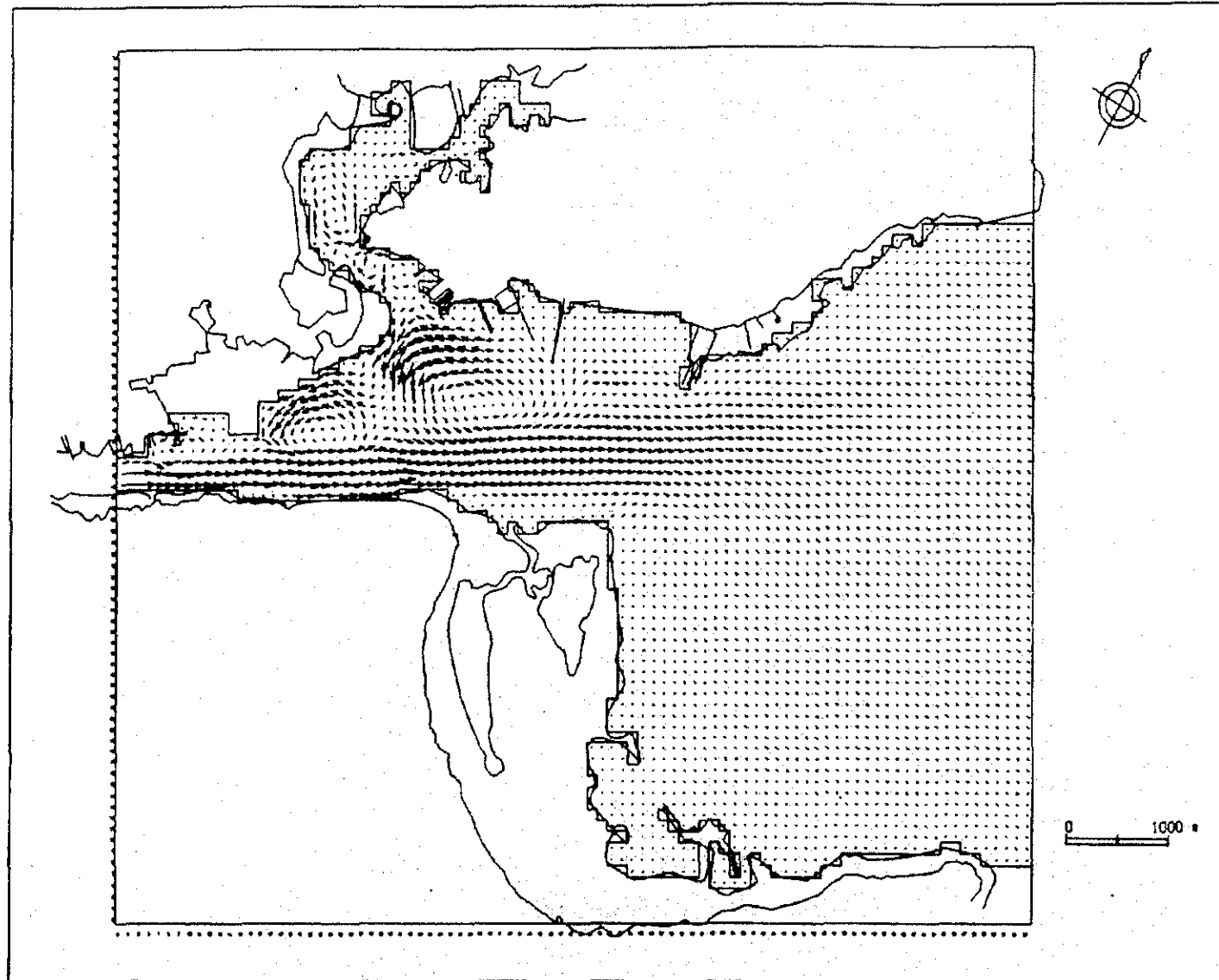


Fig. 3.3.3-3 Current Pattern - Residual Current, Present Topography

→ 20 cm/s

CURRENT(rising tide):FUTURE ,L-1

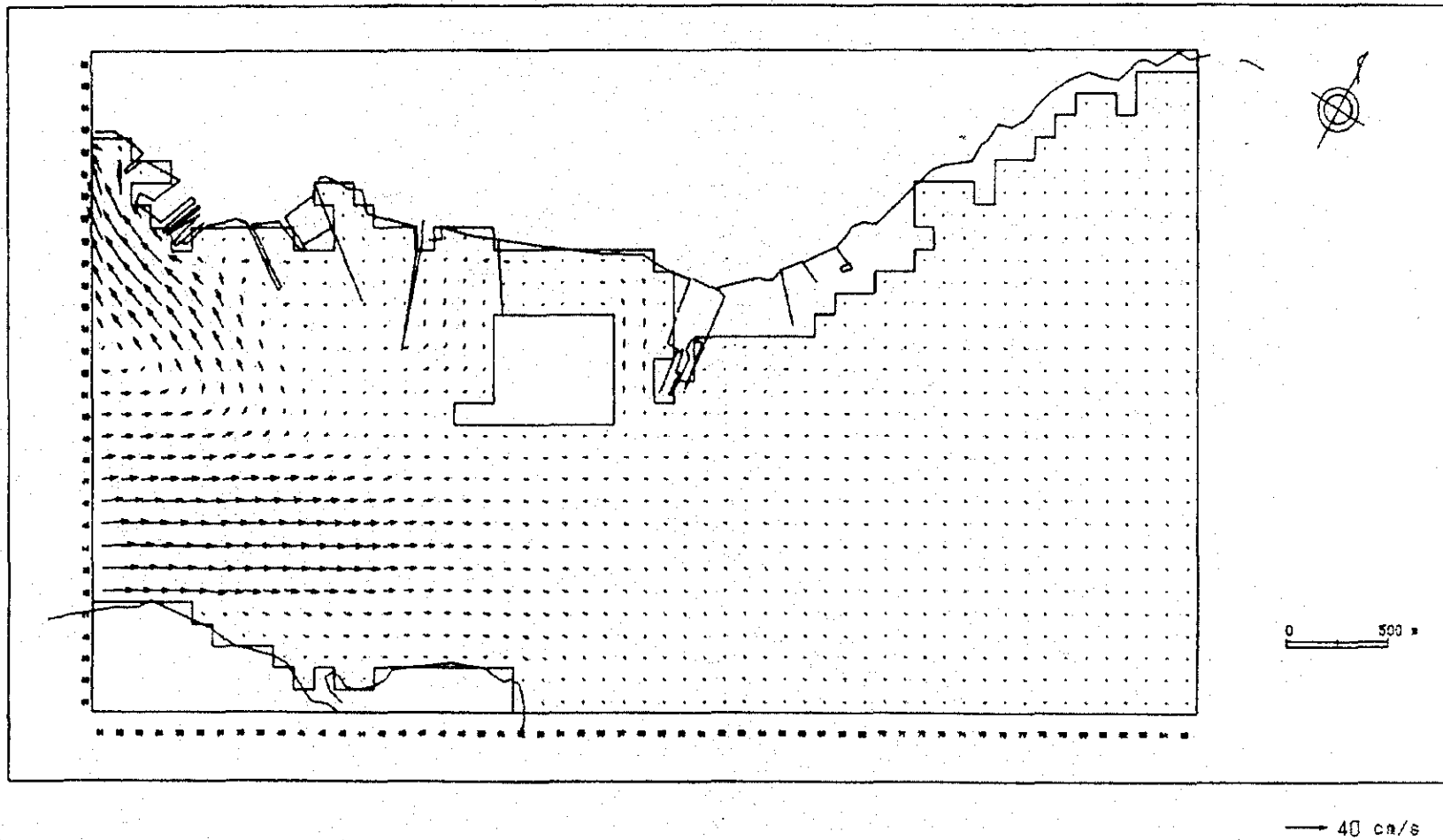
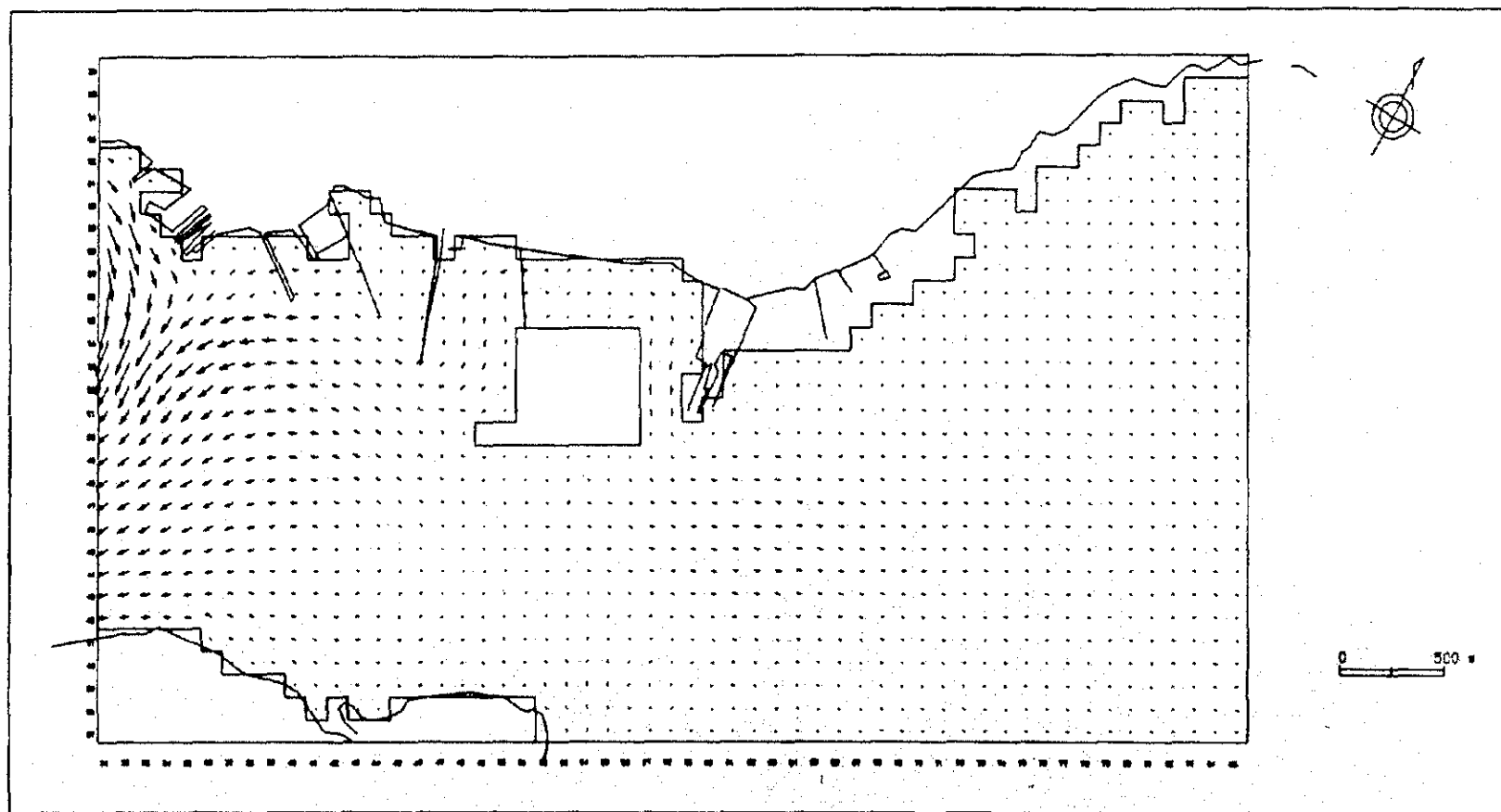


Fig. 3.3.3-4 Current Pattern - Flood Tide, After Construction

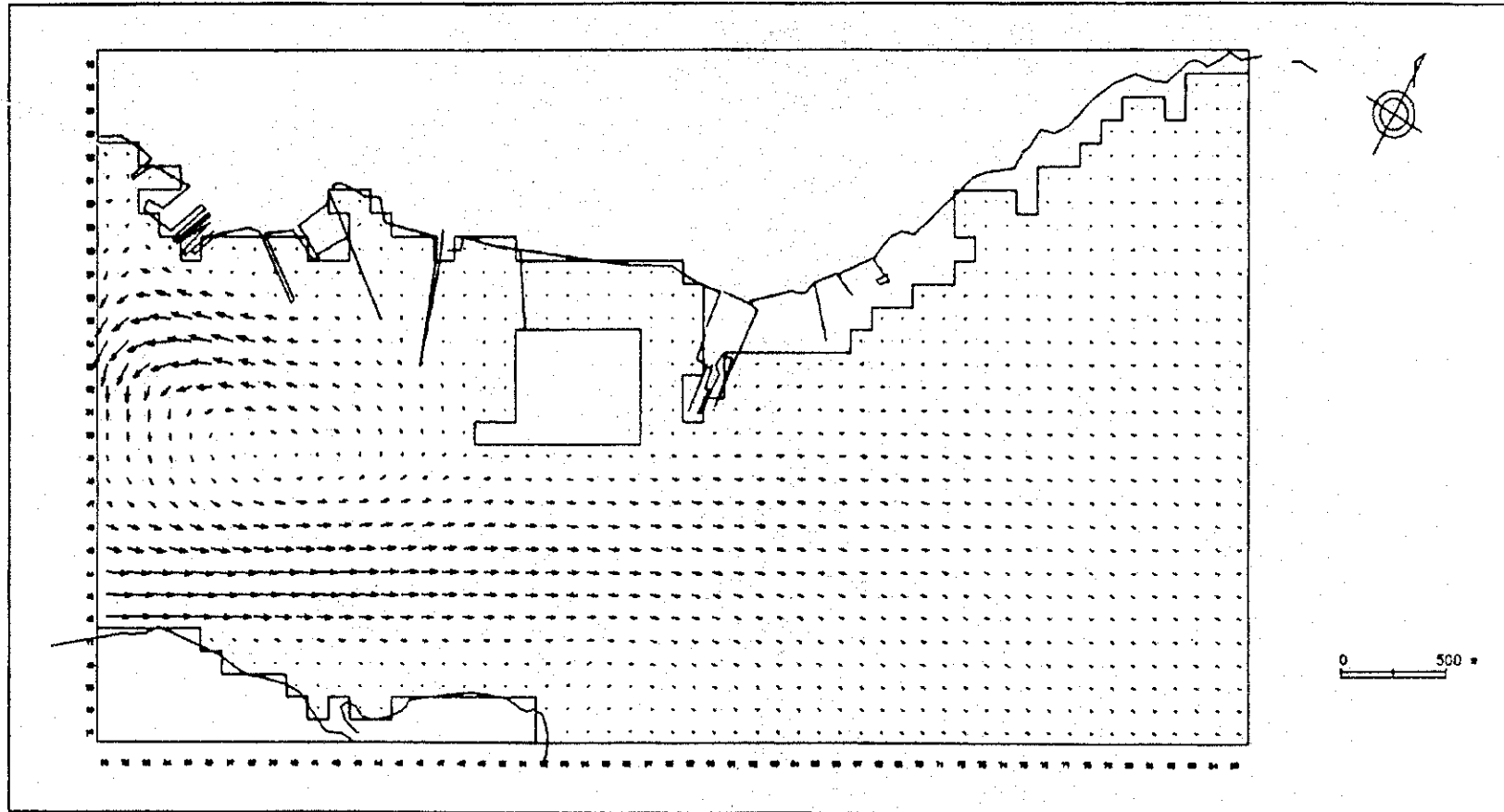
CURRENT(falling tide):FUTURE ,L-1



→ 40 cm/s

Fig. 3.3.3-5 Current Pattern - Ebb Tide, After Construction

CURRENT(RESIDUAL):FUTURE ,L-1



→ 20 cm/s

Fig. 3.3.3-6 Current Pattern - Residual Current, After Construction

DIFFERENCE CURRENT VELOCITY(mm) (RESIDUAL):FUTURE ,L-1

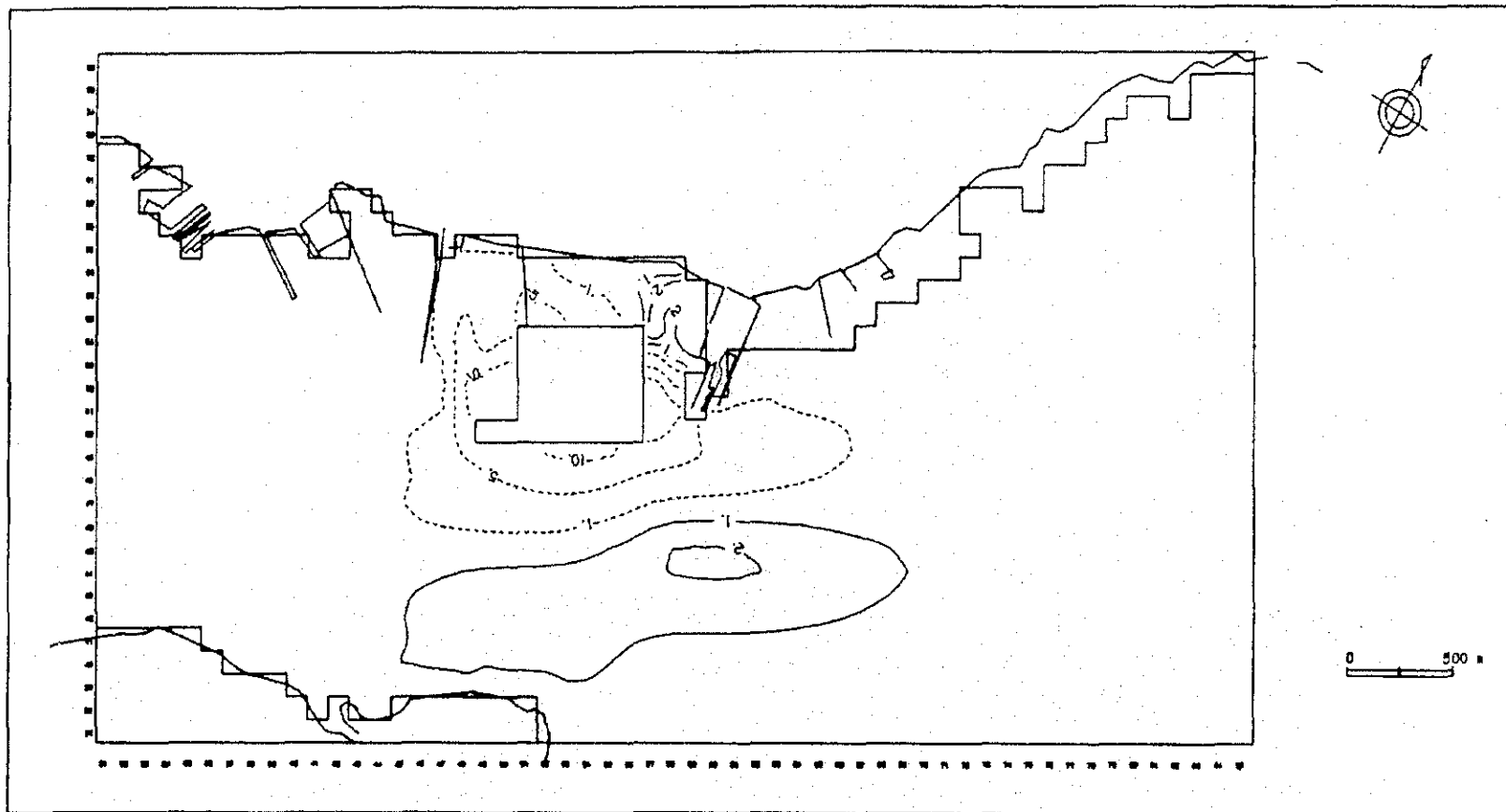


Fig. 3.3.3-7 Difference of Current Velocity - Residual Current, (Present - After Construction); unit: mm/sec

## (2) Diffusion of Suspended Solid during Reclamation Works

According to the construction plan (Section 8.5), approximately 1,300,000 m<sup>3</sup> of reclamation soil will be dumped in the sea at the average rate of 5,000 m<sup>3</sup> per day. When the soil is dumped, the particles with large grains will deposited immediately, however, the silt components are transported longer distance as suspended solids and may affect the water quality in a larger area. Diffusion of the suspended solid during the reclamation works are simulated.

### 1) Methodology

The diffusion of suspended solid during the reclamation works is calculated using the same model used in the current calculation. In transporting sediments, there are two processes; i.e., advection and turbulent diffusion. The following equations used for the calculation express the above phenomena.

Diffusion:

$$\frac{\partial S}{\partial t} = -\frac{\partial}{\partial x}(uS) - \frac{\partial}{\partial y}(vS) - \frac{\partial}{\partial z}(wS) + \frac{\partial}{\partial x}\left(k_x \frac{\partial S}{\partial x}\right) + \frac{\partial}{\partial y}\left(k_y \frac{\partial S}{\partial y}\right) + \frac{\partial}{\partial z}\left(k_z \frac{\partial S}{\partial z}\right) + P$$

Where

u, v, w : velocity components in the x-, y- and z- directions, respectively

k<sub>x</sub>, k<sub>y</sub>, k<sub>z</sub> : diffusion parameter

P :SS load per hour

Settling velocity:

$$V = \frac{1}{18} g \frac{(\rho_s - \rho)d^2}{\mu}$$

Where

V : settling velocity (cm/sec)

ρ<sub>s</sub> : sediment density (2.7 g/cm<sup>3</sup>)

ρ : water density (1.024g/cm<sup>3</sup>)

d : diameter of sediment

μ : viscosity of water



## 2) Conditions

The assumptions used for the calculation are as follows:

Calculation Area	: 8 km x 9 km
Mesh size	: 100m
Depth of Layer	: Upper layer - 5m, lower layer - -5m to the bottom
Reclamation method	: most of the revetment work is completed prior to the reclamation work with 100m of opening left behind. Dumping point is shown in Fig. 3.3.3-8.
Reclamation Volume	: 5,000 m <sup>3</sup> /day
Grain Size	: sand - 90 % , silt - 10%, average grain size $d_{50} = 0.02$ mm (sand is neglected in the simulation)
Settling Velocity	: 0.03 cm/sec

## 3) Results

The results of the simulation are shown in Fig. 3.3.3-9. The figure shows that the influenced area is very small; turbid water is observed only around 200m around the construction area.

The criteria of suspended solid for Coastal and Marine Waters is prescribed in DENR Administrative Order No. 34 as shown in Table 3.3.3-1.

**Table 3.3.3-1 Criteria of Suspended Solid**

Classification	Total Suspended Solids
Class SA	Not more than 30% increase
Class SB	Not more than 30 mg/L increase
Class SC	Not more than 30 mg/L increase
Class CD	Not more than 60 mg/L increase

According to the same order, the proposed construction site is classified as Class SC (Recreational Water Class II, Fishery Water Class II, Marshy and/or mangrove areas declared as fish and wildlife sanctuaries). The results show that about 100 m away from the reclamation area, increase of SS concentration is less than 30.0 mg/L. Therefore, as long as the construction method and reclamation material are not different significantly from the assumptions made, the proposed work will satisfy the regulations.

Location of Discharge(SS):CONSTRUCTION Stage

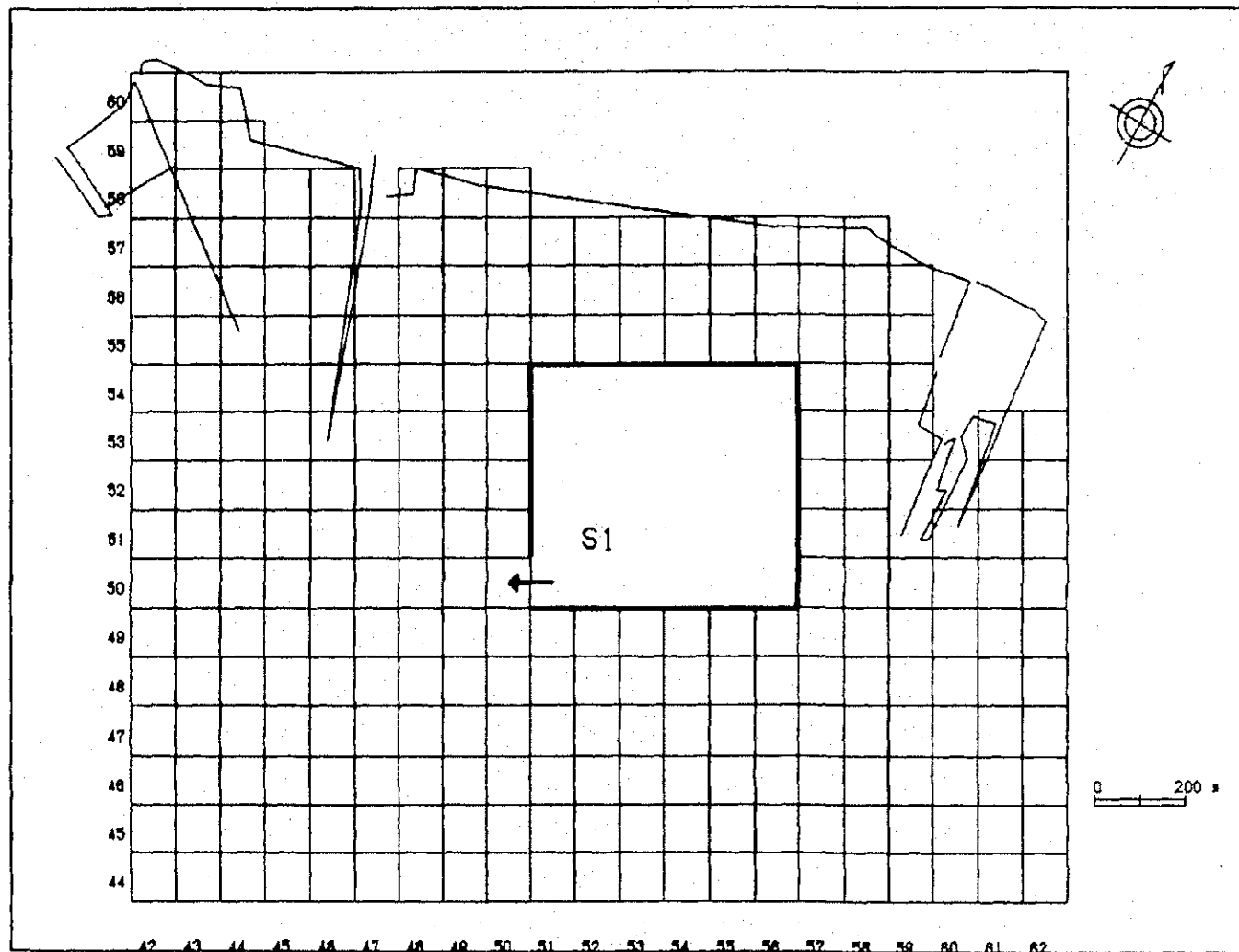


Fig. 3.3.3-8 Assumed Reclamation Point

TIDAL MAXIMUM of SS(mg/l) : CONSTRUCTION Stage, L-1

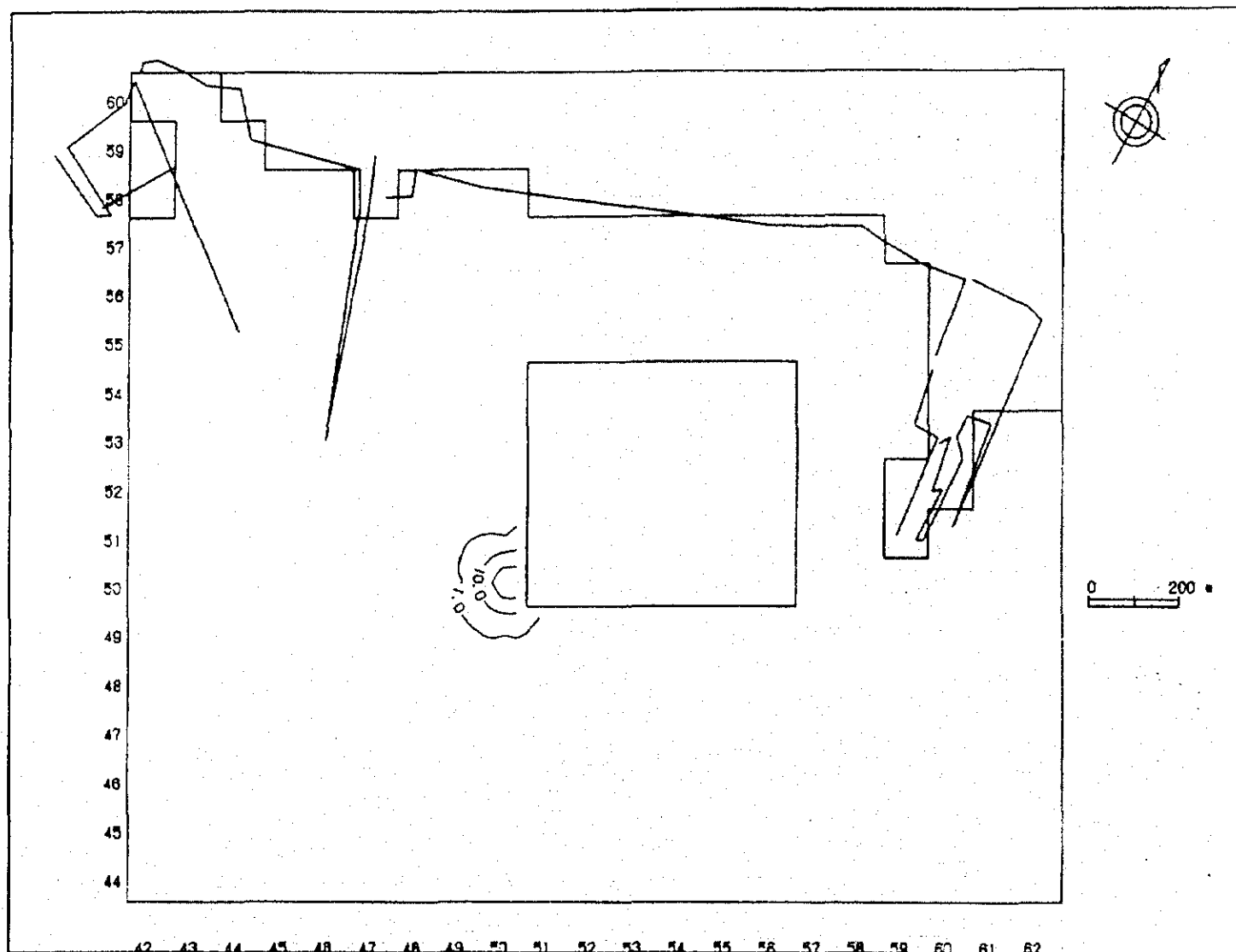


Fig. 3.3.3-9 Daily Maximum SS Concentration (unit: mg/l)

### (3) Diffusion of Chemical Oxygen Demand (COD) during the Port Operation

Although container handling is a clean operation, there are several sources of polluted water which can be considered in the operation of the New Cebu Port. Some of the examples are:

- Oil and grease from Maintenance shop
- Wastewater of container washing
- Domestic wastewater from office buildings
- Bilge water

All the wastewater will be treated to acceptable levels before it is discharged to the sea. Level of pollution is measured in COD (an index to measure organic matter) and its diffusion is computed.

#### 1) Methodology

The same model as that of the diffusion of suspended solid was used.

#### 2) Calculation of Discharge Volume and COD load

At this stage of the project, there is very little data to calculate the COD load in the future precisely, however, for the purpose and accuracy of the simulation, only the order of magnitude of values for these data are needed. The volumes at the year 2010 is roughly estimated as below.

##### - Discharge Volume

· Wastewater of container washing :	100 lt/container x 100 containers / day = 10 m <sup>3</sup> /day
· Domestic wastewater from office buildings:	100 lt/person x 500 persons / day = 50 m <sup>3</sup> /day
· Others :	40m <sup>3</sup> /day
<hr/>	
Total	100 m <sup>3</sup> /day

##### - Discharged COD load

As shown in Table 3.3.3-2, the maximum COD concentration allowed by DENR for the effluent water is between 60 - 200 mg/L depending on the classification of the water. In Japan these values are as low as 20 - 40 mg/L. In this simulation it is assumed that the water is treated to the COD concentration level of 30 mg/L. Therefore, the discharged COD load is 100 m<sup>3</sup>/day x 30 mg/L = 3 kg/day

##### - Outlet

The outlet of the sewage is assumed as shown in Fig. 3.3.3-10.

### 3) Results

The results of the simulation are shown in Fig. 3.3.3-11.

The criteria of suspended solid for Coastal and Marine Waters is prescribed in DENR Administrative Order No. 34 as shown in Table 3.3.3-2.

The maximum COD concentration originated from the port is 0.002 mg/L at the outlet. It is observed that, compared to the criteria and the actual COD level, the impact of the port operation is negligible.

**Table 3.3.3-2 Criteria of BOD\* Discharge Level, COD Concentration and Survey Results**

Classification	COD Discharge (mg/L)	BOD* (COD) mg/L	Survey results of COD Concentration (mg/L)
Class SA	Discharge is not allowed	3	28.2 - 76.5
Class SB	60	5	
Class SC	200	7	
Class CD	200	-	

Note: DENR prescribes BOD level instead of COD level. The result is compared with the BOD level shown in the above table.

Location of Discharge(COD):FUTURE

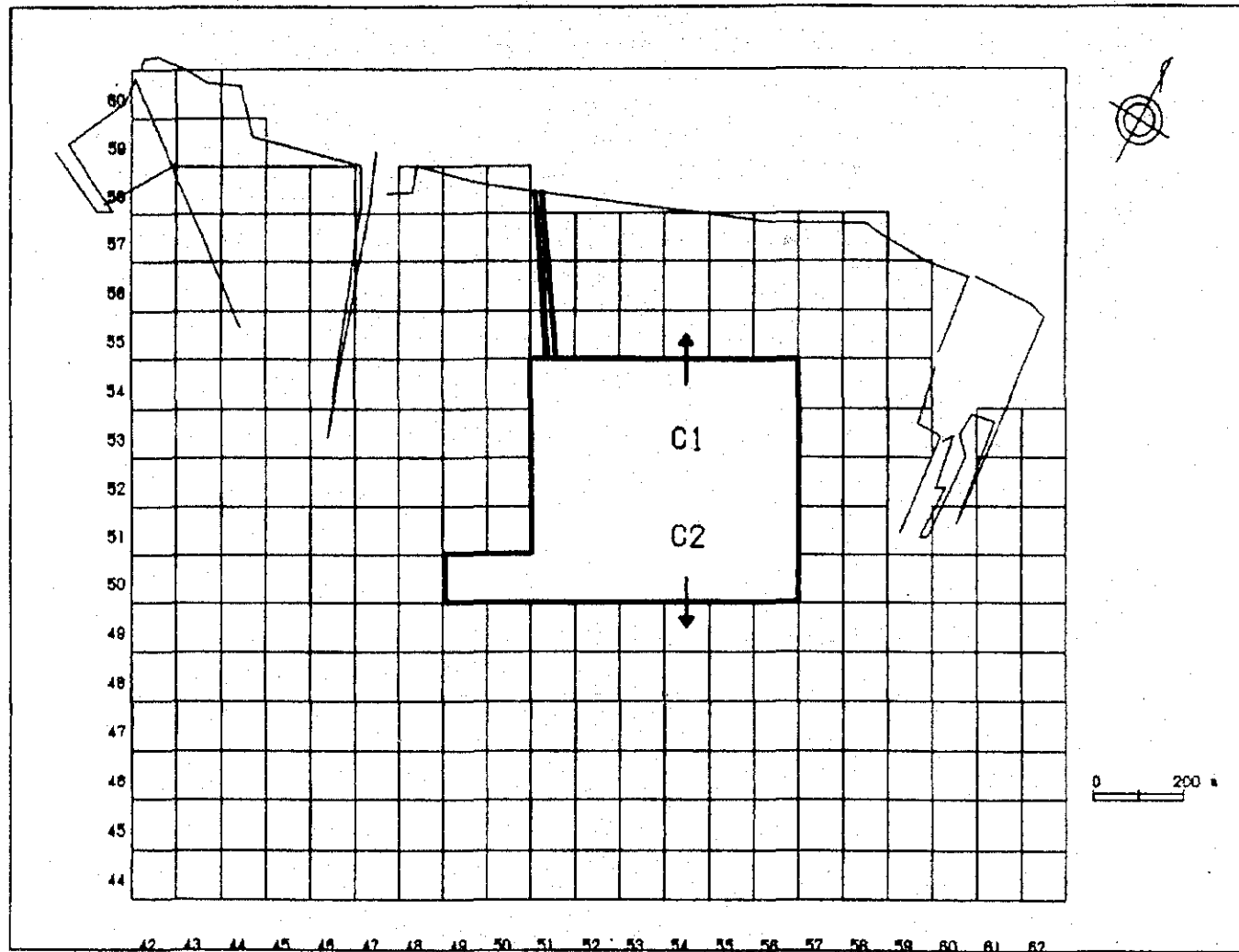


Fig. 3.3.3-10 Assumed Location of Sewage Outlet

TIDAL MAXIMUM of COD (\*10E-03 mg/l) :FUTURE, L- 1

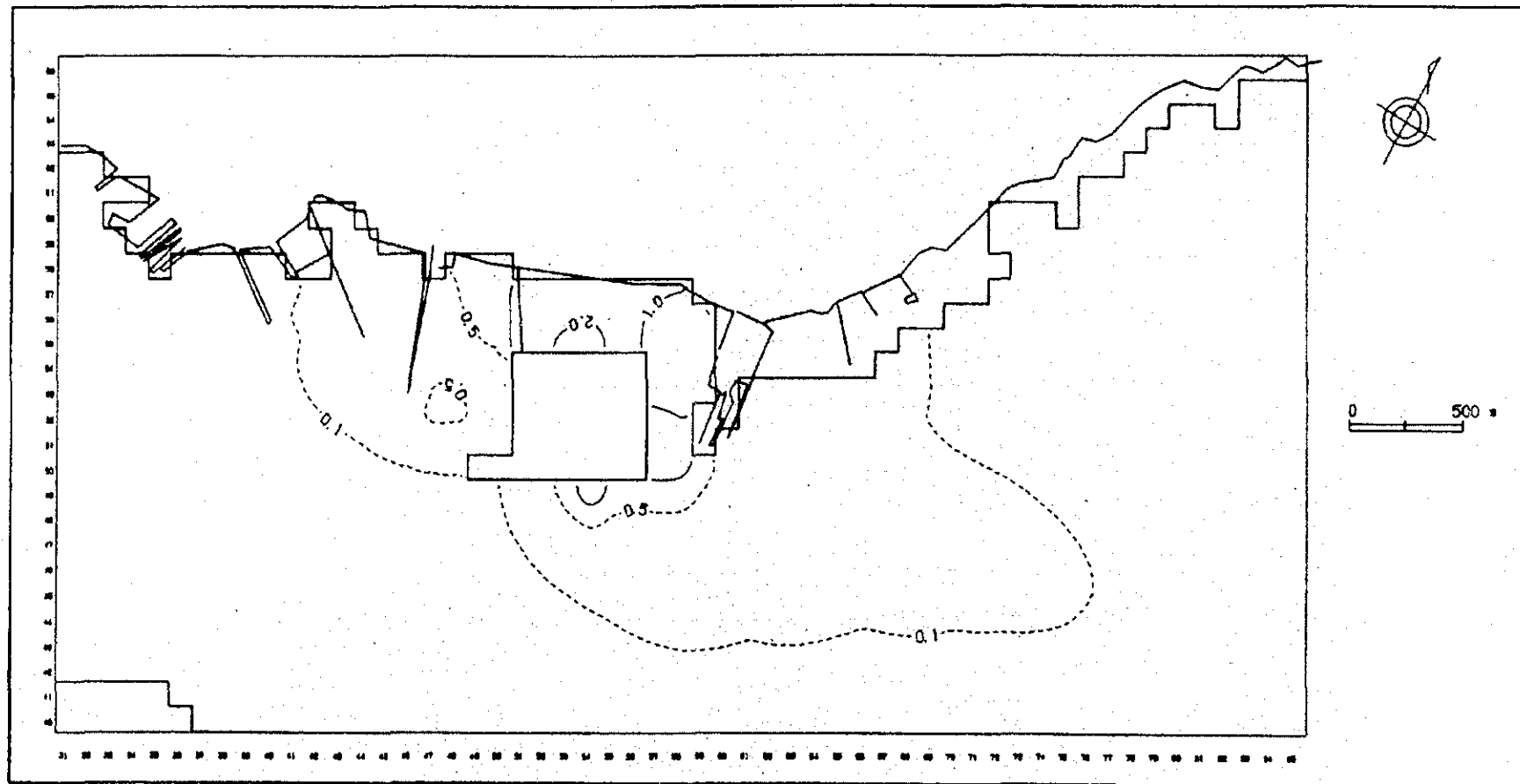


Fig. 3.3.3-11 Daily Maximum COD Concentration (unit:  $10^{-3} \text{ mg/l}$ )