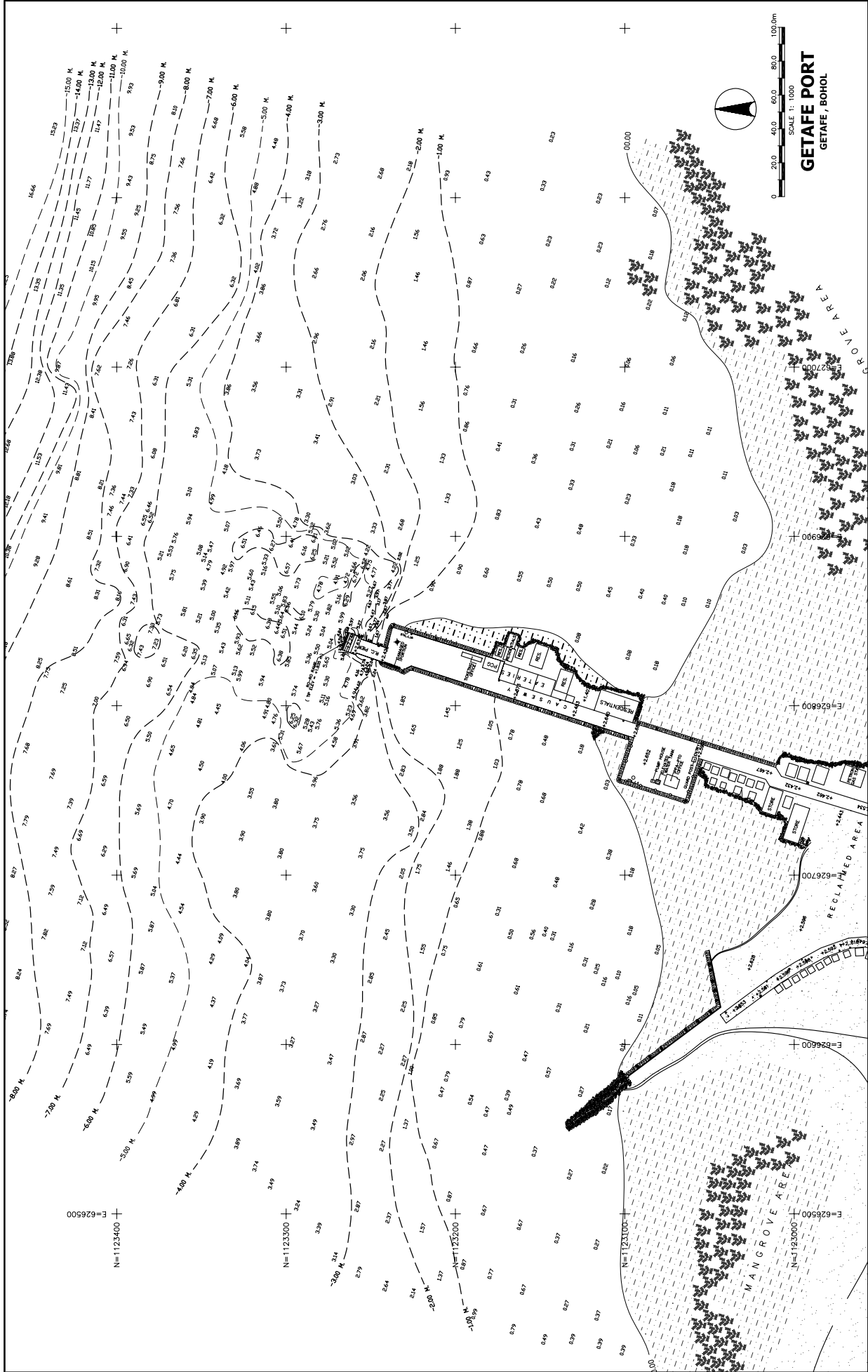






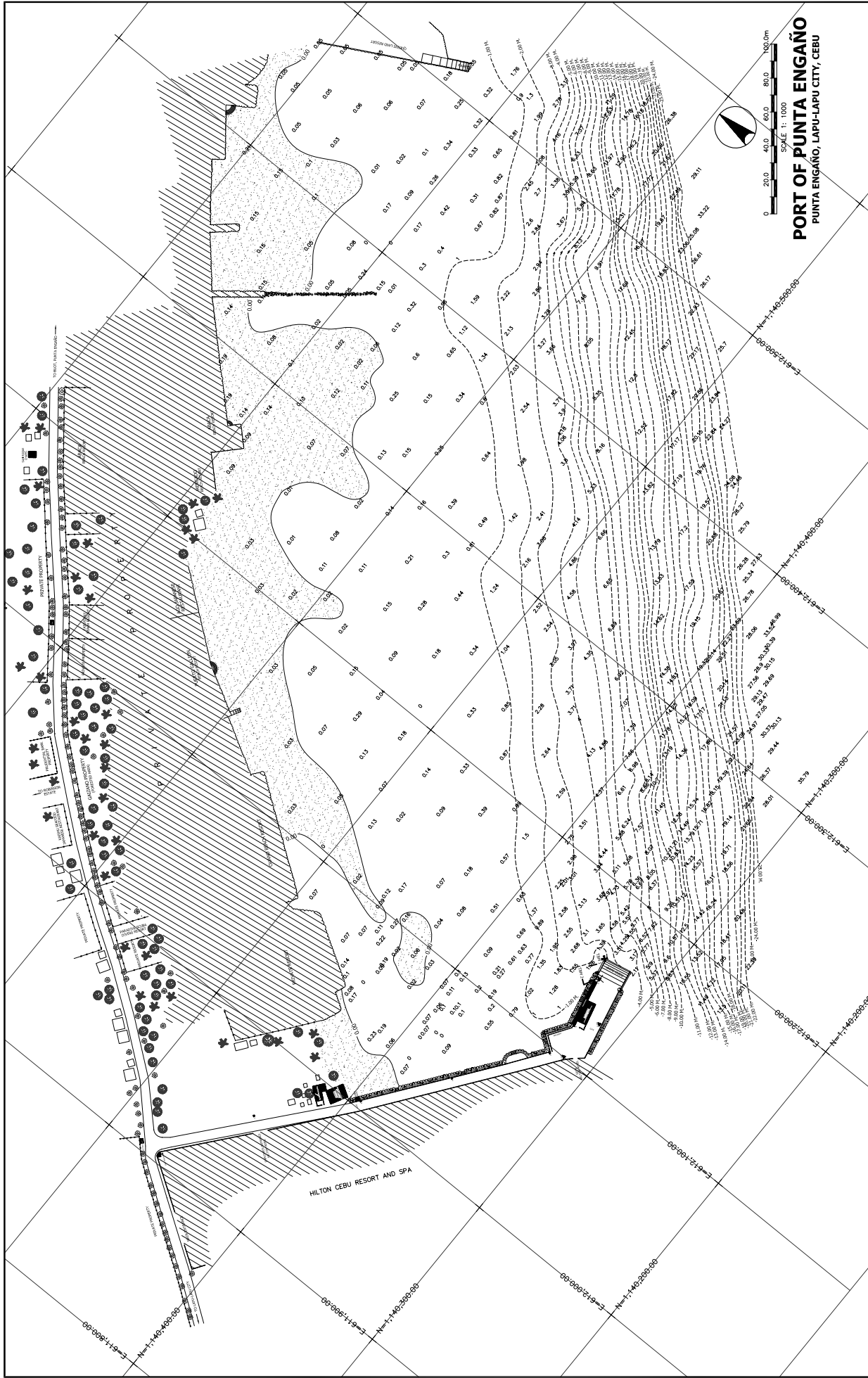


	The Overseas Coastal Area Development of Japan Pacific Consultants International (PCI)	JICA Study Team PROJECT NAME THE FEASIBILITY STUDY ON THE DEVELOPMENT OF ROAD ROAD TERMINAL SYSTEM FOR MOBILITY ENHANCEMENT	HYDROGRAPHIC / TOPOGRAPHIC MAP TOLEDO PORT, TOLEDO CITY, CEBU	SUBMITTED BY : ROBERTO R. PASCUA PROJECT TEAM LEADER	APPROVED BY : MASATO SUZUKI SR. PORT ENGINEER / PCI	CONCURRENT BY : HARUTO OKADA TEAM LEADER / OOD	SHEET NO 1
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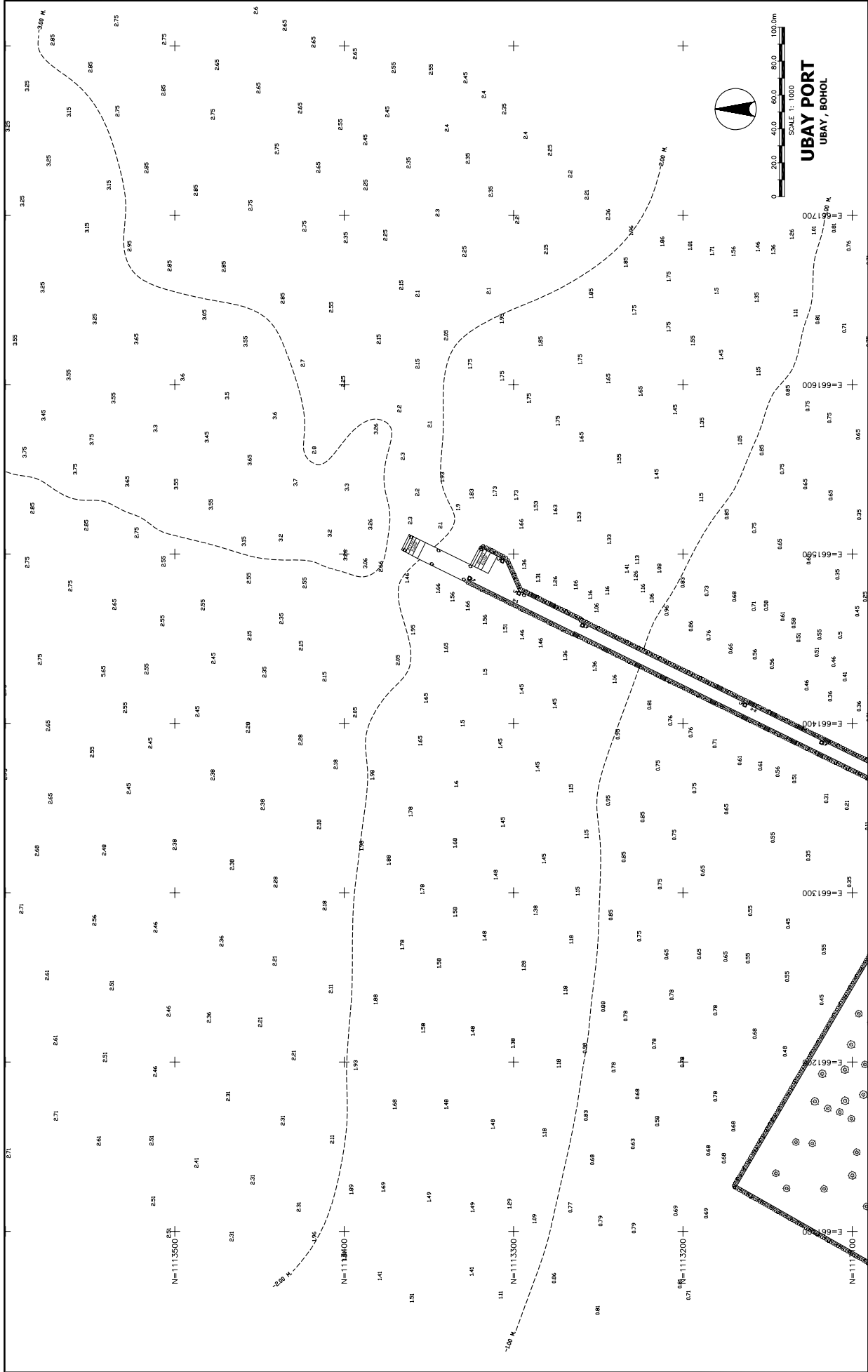
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CONCURRED BY :	APPROVED BY :	SUBMITTED	DRAWING TITLE
 HARTO OKADA TEAM LEADER / CDS	 MASATO SUZUKI SR. PORT ENGINEER / PCI	 ROBERTO R. PASCUA PROJECT TEAM LEADER	HYDROGRAPHIC / TOPOGRAPHIC MAP GETAFE PORT, GETAFE, BOHOL
 The Overseas Coastal Area Development of Japan	 JICA Study Team	PROJECT NAME THE FEASIBILITY STUDY ON THE DEVELOPMENT OF ROAD ROAD TERMINAL SYSTEM FOR MOBILITY ENHANCEMENT	PROJECT TITLE HYDROGRAPHIC / TOPOGRAPHIC MAP GETAFE PORT, GETAFE, BOHOL
Republic of the Philippines DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS	 Pacific Consultants International (PCI)		



PORT OF PUNTA ENGAÑO
 PUNTA ENGAÑO, LAPU-LAPU CITY, CEBU



SHT. NO	CONCURRED BY : HARLO OAZA TEAM LEADER / CDS
APPROVED BY : RODRIGO B. PASCUA SR. PORT ENGINEER / PCI	SUBMITTED
DRAWING TITLE TOPOGRAPHIC & HYDROGRAPHIC SURVEY OF PUNTA ENGAÑO PORT PUNTA ENGAÑO, LAPU-LAPU CITY, CEBU	PROJECT NAME THE FEASIBILITY STUDY ON THE DEVELOPMENT OF ROAD ROAD TERMINAL SYSTEM FOR MOBILITY ENHANCEMENT

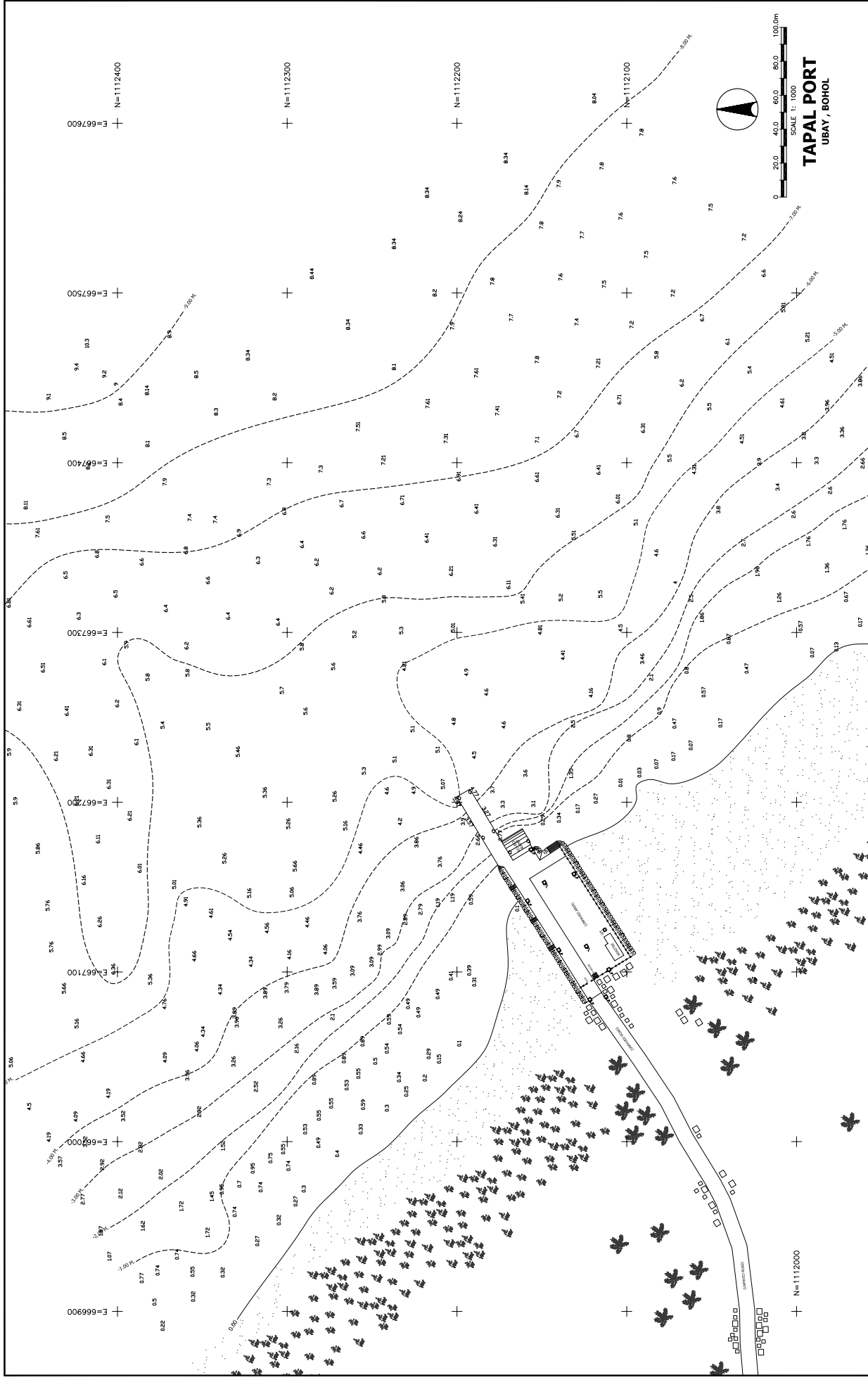


 The Overseas Coastal Area Development of Japan Pacific Consultants International (PCI)	PROJECT NAME THE FEASIBILITY STUDY ON THE DEVELOPMENT OF ROAD ROAD TERMINAL SYSTEM FOR MOBILITY ENHANCEMENT	DRAWING TITLE HYDROGRAPHIC / TOPOGRAPHIC MAP UBAY PORT, UBAY, BOHOL	SUBMITTED	APPROVED BY : MASATO SUZUKI SR. PORT ENGINEER / PCI	CONCURRED BY : HAROLD OADJA TEAM LEADER / OOD	SHEET NO
			PROJECT NAME JICA Study Team The Overseas Coastal Area Development of Japan Pacific Consultants International (PCI)	SUBMITTED	APPROVED BY : MASATO SUZUKI SR. PORT ENGINEER / PCI	CONCURRED BY : HAROLD OADJA TEAM LEADER / OOD

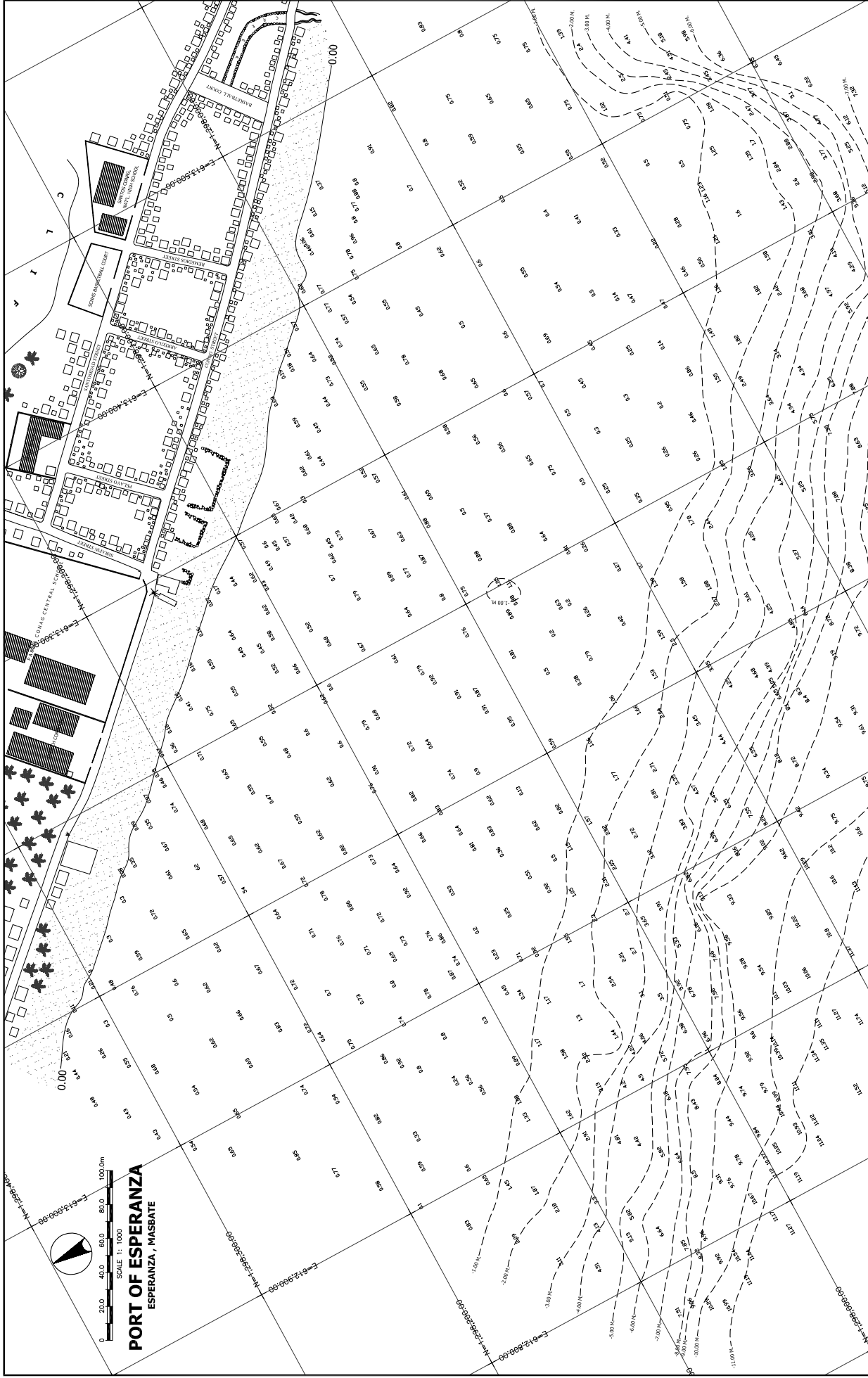







DEPARTMENT OF TRANSPORTATION
 AND COMMUNICATIONS

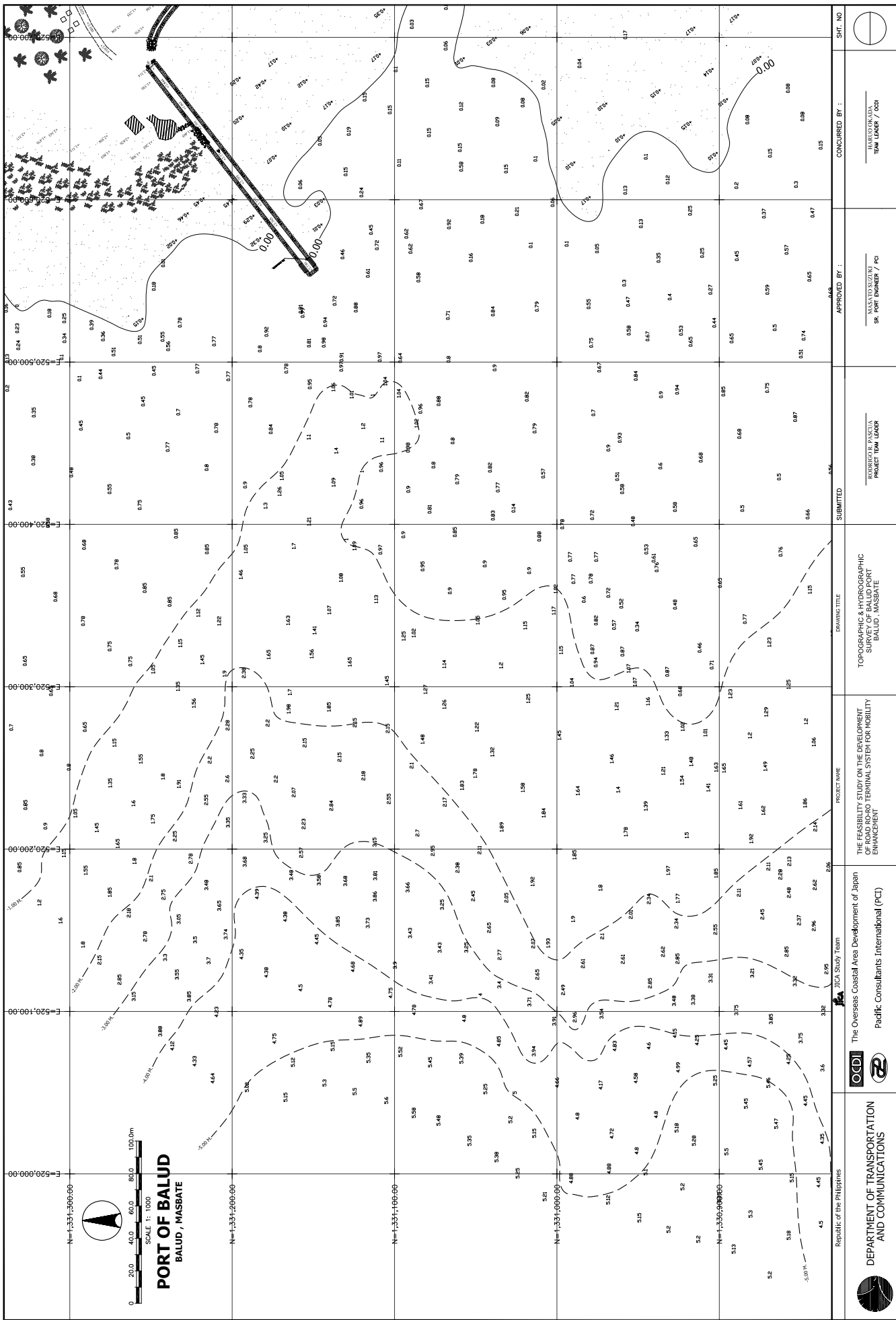
Republic of the Philippines

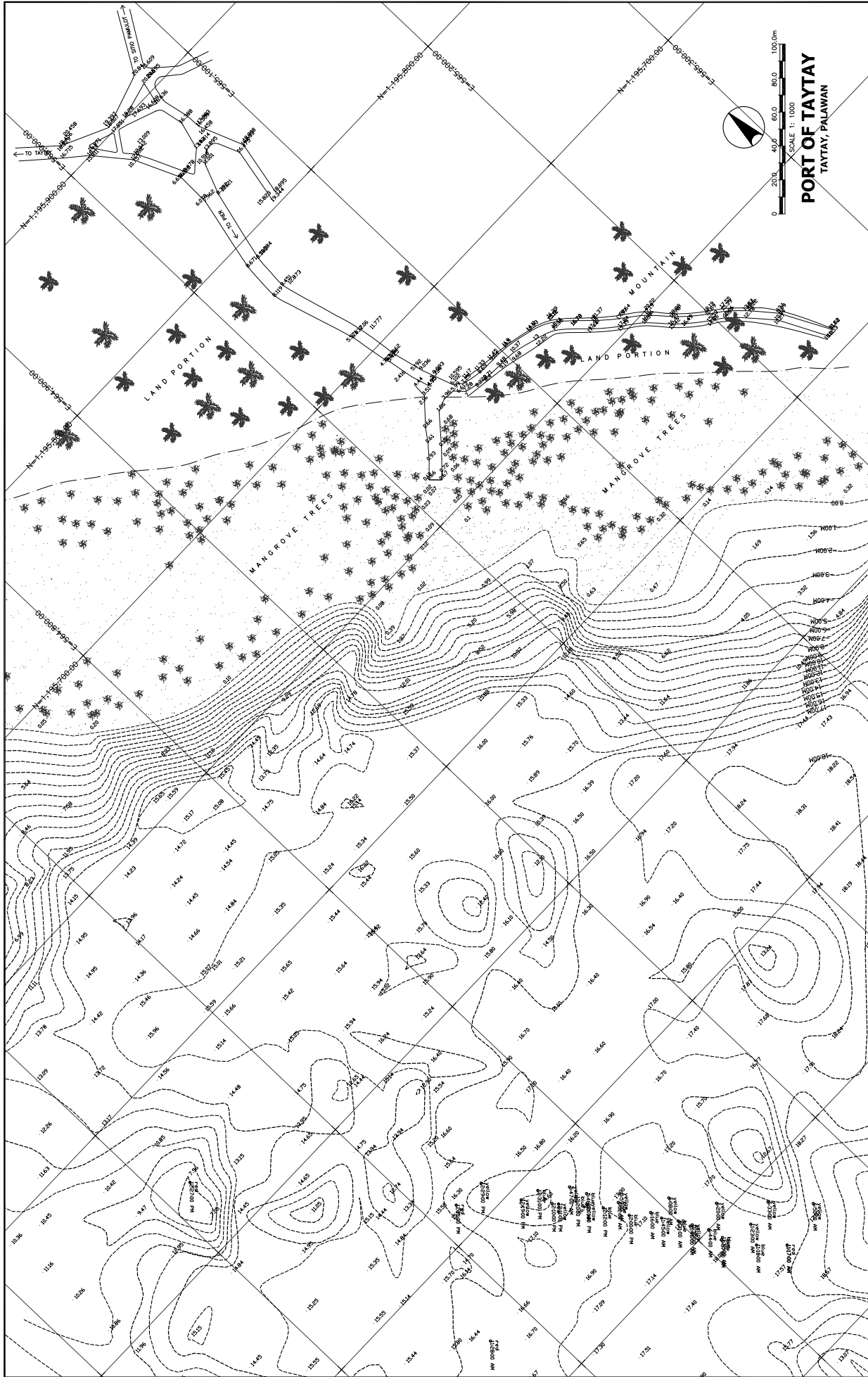


<p>DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS</p>	<p>JICA Study Team</p> <p>The Overseas Coastal Area Development of Japan</p> <p>Pacific Consultants International (PCI)</p>	<p>PROJECT NAME</p> <p>THE FEASIBILITY STUDY ON THE DEVELOPMENT OF ROAD ROAD TERMINAL SYSTEM FOR MOBILITY ENHANCEMENT</p>	<p>DRAWING TITLE</p> <p>HYDROGRAPHIC / TOPOGRAPHIC MAP TAPAL PORT, TAPAL, UBAY, BOHOL</p>	<p>SUBMITTED</p> <p>RODRIGO B. PASCUA PROJECT TEAM LEADER</p>	<p>APPROVED BY :</p> <p>HASATO SUZUKI SR. PORT ENGINEER / PCI</p>	<p>CONCURRED BY :</p> <p>HARUO OKADA TEAM LEADER / JODS</p>	<p>SHT. NO</p> <p>1</p>
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 DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS		 The Overseas Coastal Area Development of Japan		 JICA Study Team		 Pacific Consultants International (PCI)		TOPOGRAPHIC & HYDROGRAPHIC SURVEY OF ESPERANZA PORT ESPERANZA, MASBATE		PROJECT NAME THE FEASIBILITY STUDY ON THE DEVELOPMENT OF ROAD ROORO TERMINAL SYSTEM FOR MOBILITY ENHANCEMENT		DRAWING TITLE		SUBMITTED BY : ROBRICO E. PASCUA PROJECT TEAM LEADER		APPROVED BY : MASA TO SUZUKI SR. PORT ENGINEER / PCI		CONCURRED BY : HARUO OKADA TEAM LEADER / OCEB		SHEET NO 	
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	Republic of the Philippines DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS		The Overseas Coastal Area Development of Japan Pacific Consultants International (PCI)	PROJECT NAME THE FEASIBILITY STUDY ON THE DEVELOPMENT OF ROAD ROAD TERMINAL SYSTEM FOR MOBILITY ENHANCEMENT	DRAWING TITLE TOPOGRAPHIC & HYDROGRAPHIC SURVEY OF TAYTAY PORT TAYTAY, PALAWAN	SUBMITTED ROBERTO R. PASCUA PROJECT TEAM LEADER	APPROVED BY : MASAOTO SUZUKI SR. PORT ENGINEER / PCI	CONCURRED BY : HARUO OKADA TEAM LEADER / OCED	SHIT. NO
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Current Observation Results

CURRENT OBSERVATION REPORT

A. FOREWORD

To obtain the best result in current survey, the observation must be conducted during spring tide: new or full moon. Moreover, the duration must be long - minimum of 15 days continuous observation. This was not the case during these surveys because of the very tight schedule to complete the work. This survey therefore is intended to have a glimpse of the strength of current obtaining in planned RORO port/terminal locations. Allowance must be provided for safety purpose as the data contained herein may not be the maximum velocities.

Every effort was made by the team to follow the instruction provided by the client concerning location of starting points for observation. Tidal observation were made simultaneously in each port location as a matter of requirements.

B. CURRENT SURVEY LOCATION

Current measurements were made in the following ports:

1. Caticlan (Tabon), Aklan
2. Dumangas, Iloilo
3. Kawayan, Biliran
4. Taytay, Palawan
5. Daanbantayan, Cebu
6. Pilar, Sorsogon
7. Balud, Masbate
8. Esperanza, Masbate

Locations of starting points for float releases were chosen by the client. Generally they are near pier or at the middle of the channel.

C. METHODOLOGY

Float tracking method were employed in the survey. Typical configuration of current floats used is shown in Fig 1.

Measurements were made in three (3) levels of water depths: 1. the sea surface, 2. mid. depth 3. full sea depth. An allowance of 1 – 2 meters is provided for the full sea depth length of rope to guard against the float getting entangled with bottom obstruction and seabed during transit. Position of floats were measured by total station theodolite from shore.

As far as practicable, measurements were made during full tidal cycle : low tide – high tide – low tide period.

Survey sequence is as follows:

As the boat proceed to unload the floats at the starting points location, the theodolite is set at a GPS station on shore & orient the telescope with another geodetic control of known coordinates. The instrumentmen then guide the boat to initial point at sea and upon signal, stop and unload/release the floats one at a time. Their position and time of measurement are then determined and recorded.

Subsequent fixes of float position are then made depending on the speed the floats travel. As the float goes beyond the topo/hydro map coverage the float are then hauled on board and brought back to the original starting point. while these exercise is going on, the tide staff reading on shore is being monitored and recorded hourly.

The sequence of events is repeated until the full tidal cycle period is completed.

D. SURVEY RESULT

Detailed observation records are shown in Annex E. A summary of these records highlighting highest current speeds, direction, time and tide conditions may be found in Annex E.1

It is worth mentioning here that generally good weather condition were prevailing at the time of surveys. Winds were light and the sea calm.

For identification purposes in the abovementioned tabulation, flood current is tidal current that attains maximum velocity during the time from low water to high water; it is ebb current when maximum velocity is attained during the time from high water to low water.

Because of the very short survey duration, the results do not provide the necessary constituents needed for an accurate data evaluation and harmonic analysis by the least square method. The result should therefore be treated as raw data at time and date of survey and not necessarily a representative velocity at the site.

Highest bottom velocity of almost 1 mps were obtained in Dumangas port. This may be attributed to the influence of Iloilo strait where current is observed to reach upward of 2.5 mps. This is followed by Esperanza with 0.358 mps and Caticlan with 0.208 mps in that order.

Highest surface current is recorded at Dumangas also with 0.682 mps. Surface current is generally wind generated.

TABULATION OF MAXIMUM CURRENT SPEEDS OBTAINED

	Caticlan 10 June 07	Dumangas 8 June 07	Kawayan 7 July 07	11 Tayaty July 07	Daanbantayan 1 June 07	Pilar 30 May 07	Balud 24 May 07	Esperanza 27 May 07	REMARKS
Highest speed obtained (mps)	15.85	40.94	12.50	4.99	12.00	6.5	11.67	10.83	Surface
	19.70	38.77	3.64	0.52	8.60	8.83	11.00	16.83	Mid. depth
	12.50	56.40	10.91	0.826	8.33	8.50	11.20	21.50	Full depth
Time (Hrs & Min)	1817	1744	1409	1128	1416	0810	0941	0936	Surface
	1815	1346	1348	1201	1425	1034	0952	1010	Mid depth
	1408	1440	1417	1220	1426	1100	0949	0947	Full depth
Tide Condition (Ht. In mtrs.)	Flood (1.26)	Ebb (1.20)	Flood (1.22)	Ebb (0.61)	Ebb (0.40)	Flood (1.20)	Flood (0.80)	Ebb(1.20)	Surface
	Flood (1.26)	Flood (1.04)	Flood (1.18)	Ebb (0.41)	Ebb (0.40)	Flood (1.30)	Flood (0.80)	Ebb(1.05)	Mid depth
	Flood (0.93)	Flood (1.52)	Flood (1.22)	Ebb (0.61)	Ebb (0.40)	Ebb (1.07)	Flood (0.80)	Ebb(1.05)	Full depth
Direction of Current (azimuth)	282° 30'	272° 30'	045° 00'	272° 00'	007° 00'	131° 00'	042° 00'	102° 30'	Surface
	276° 30'	108° 30'	270° 00'	260° 00'	037° 00'	110° 00'	035° 00'	120° 00'	Mid depth
	001° 00'	107° 00'	270° 00'	250° 00'	036° 00'	114° 00'	042° 00'	131° 00'	Full depth