NIPPON KOEI CO.,LTD.

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Light House	**Pay Item No. (BOQ)**	2I-01 07
Quantity Item	Compaction	**Unit**	m^2

Calculation Procedure Applied

Compaction area was computed based on the drawing.

References, Calculation Base and Revisions

See the item of excavation and disposal of light house. (2I-01)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karlo Gonio			Mr. Inoma		Mr. Ando		
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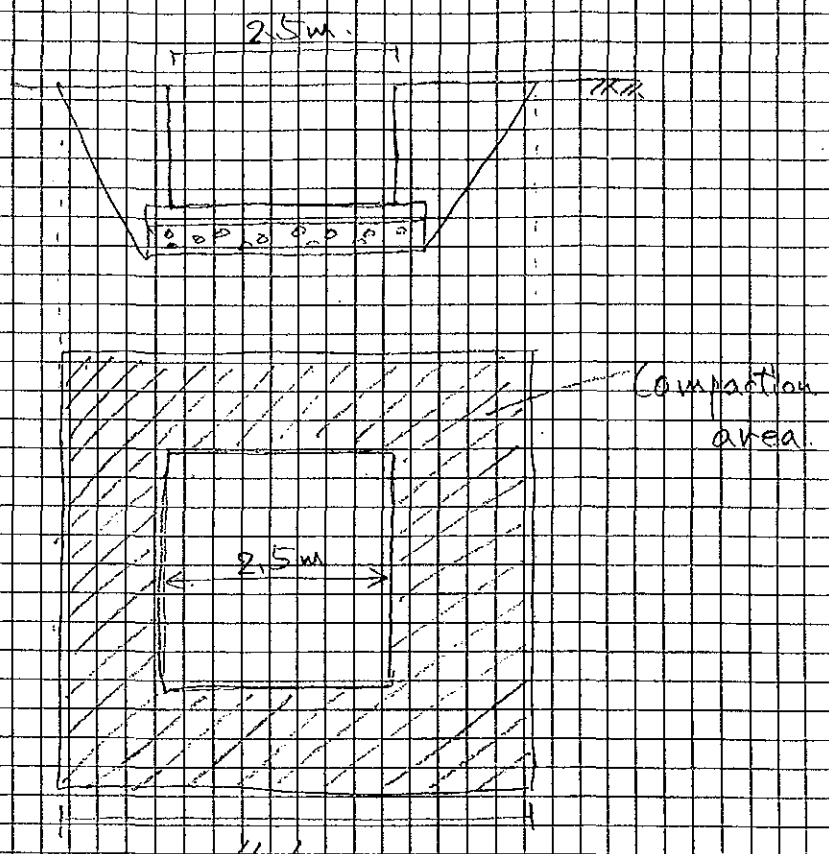
FN : Calculation_Cover_Sheet_020504_seg cover

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Light House	Calc. Index No.	
Subject	Compaction	Page No.	Rev.

References/ Notes



$A = 4.1^2 - 2.5^2$

$= 10.56$

$\simeq \boxed{10.6}\ m^2$

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FN: Calculation_Sheet

NIPPON KOEI CO.,LTD.

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Light House	**Pay Item No. (BOQ)**	2I-0108
Quantity Item	Structure	**Unit**	set

Calculation Procedure Applied

See drawings attached to 2I-01.

References, Calculation Base and Revisions

See the item of excavation and disposal of light house. (2I-01)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Garcia			Mr. Tsuma		Mr. Ando		
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NIPPON KOEI CO.,LTD.

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Light Beacon	**Pay Item No. (BOQ)**	2I-02
Quantity Item	Structure	**Unit**	sets

Calculation Procedure Applied

See drawings attached to 2I-01.

References, Calculation Base and Revisions

none.

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Garcia			Mr. Inoma		Mr. Ando		
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NIPPON KOEI CO.,LTD.

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Channel Entrance Maker Buoy	**Pay Item No. (BOQ)**	2T-0301
Quantity Item	Maker Buoy	**Unit**	sets

Calculation Procedure Applied

Number of channel Maker Buoy was computed based on the drawing.

References, Calculation Base and Revisions

DW-NA-00-001
DW-NA-02-001

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Kaika Garcia			Mr. Inoma		Mr. Ando		
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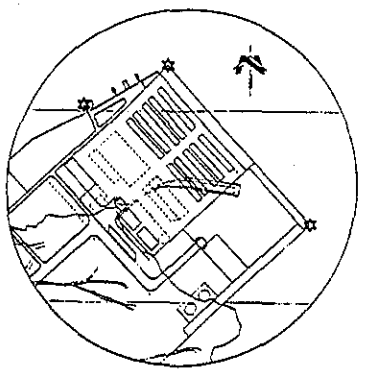
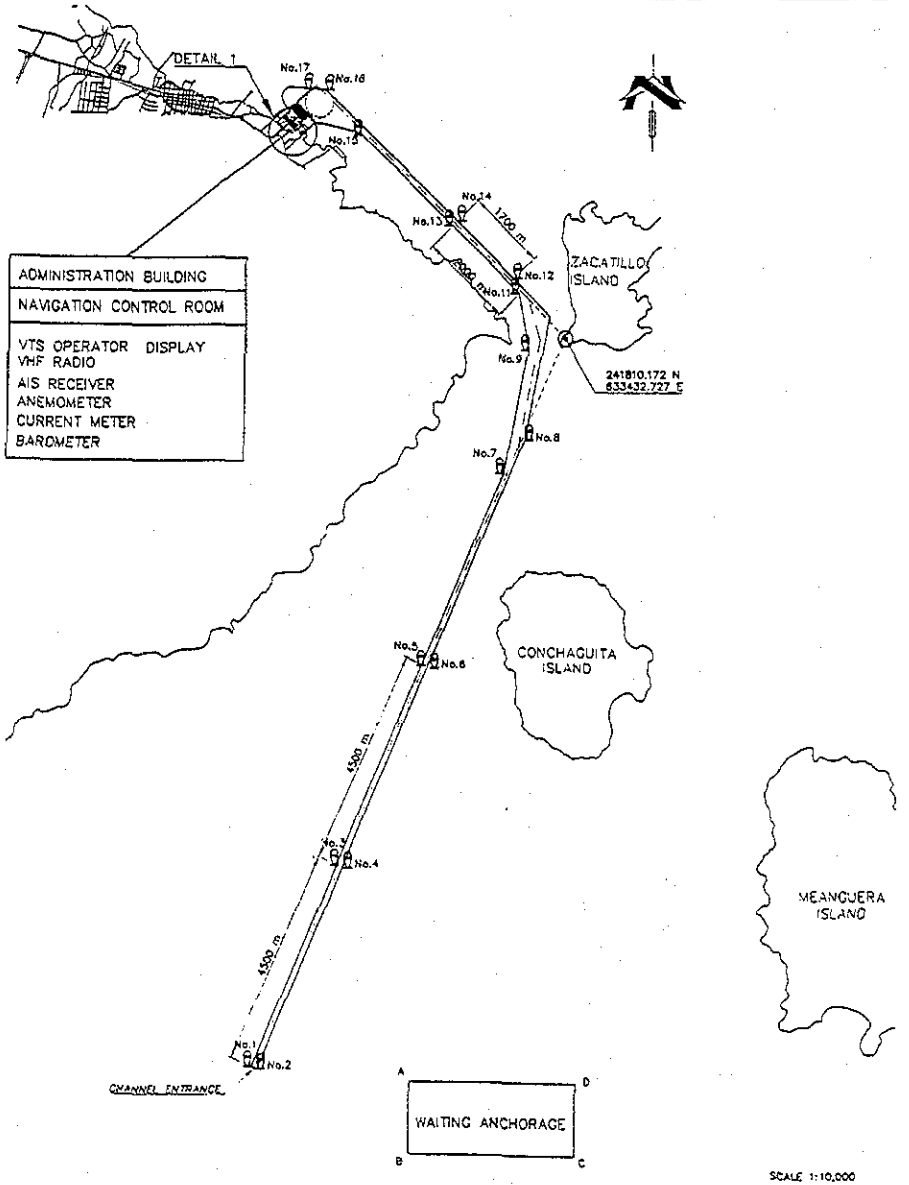


DETAIL 1
SCALE 1:1,250



ADMINISTRATION BUILDING

NAVIGATION CONTROL ROOM

VTS OPERATOR DISPLAY
VHF RADIO
AIS RECEIVER
ANEMOMETER
CURRENT METER
BAROMETER

SCALE 1:10,000

COORDINATES OF WAITING ANCHORAGE

POINT	NORTH	EAST
A	226473.500	630431.700
B	224973.500	630431.700
C	224973.500	633931.700
D	226473.500	633931.700

COORDINATION OF MARKER BUOYS

	NORTH	EAST
CENTER OF ENTRANCE	226678.269	627155.313
No.1	226703.700	627095.500
No.2	226652.900	627215.100
No.3	230845.900	628853.600
No.4	230795.100	628973.300
No.5	234988.200	630611.800
No.6	234937.400	630731.400
No.7	238970.200	632186.700
No.8	239678.600	632620.500
No.9	241547.600	632662.700
~		
No.11	242678.600	632433.700
No.12	242985.100	632319.300
No.13	244068.000	630995.100
No.14	244166.100	631096.500
No.15	245973.200	629012.000
No.16	246916.700	628234.900
No.17	246925.600	627954.800

COORDINATION OF LIGHTHOUSE

LIGHT HOUSE	241810.172	633432.727

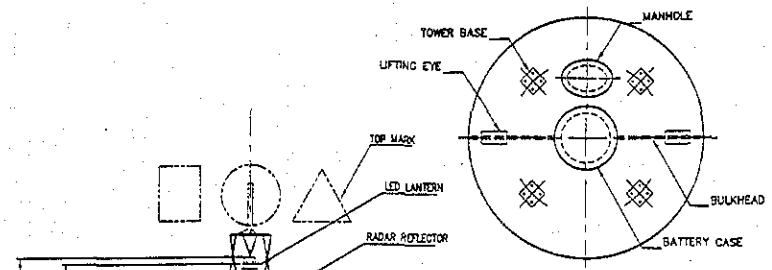
COORDINATION OF LIGHT BEACON

AT THE CORNER OF THE BERTH AND ON THE PLATFORM

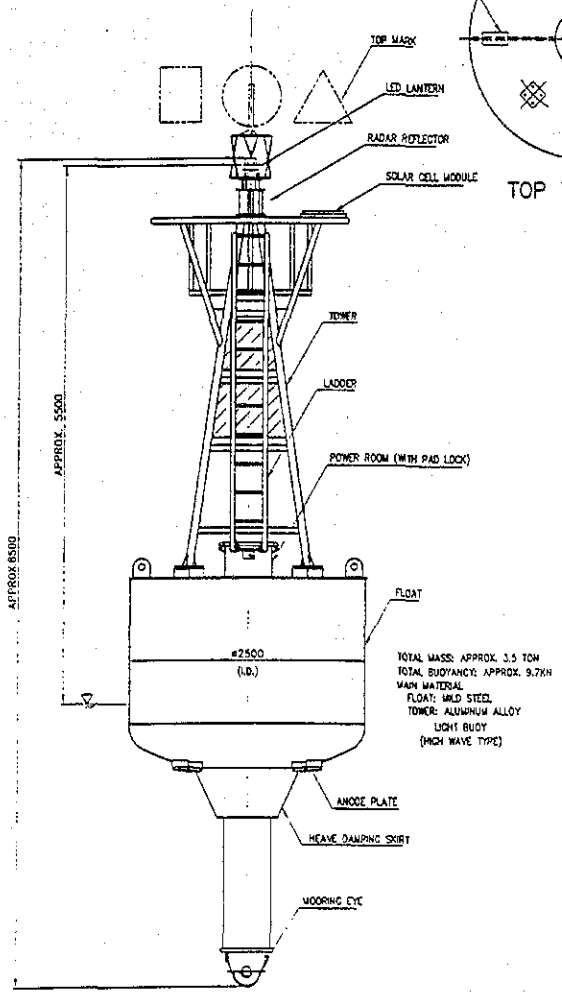
LEGEND

- LIGHTED BUOY : 16 nrs
- LIGHT HOUSE : 1 LOCATION WITH RELAY ANTENNA FOR VHF RADIO AND AIS
- LIGHT BEACONS (JETTY MARKER): 3 nrs

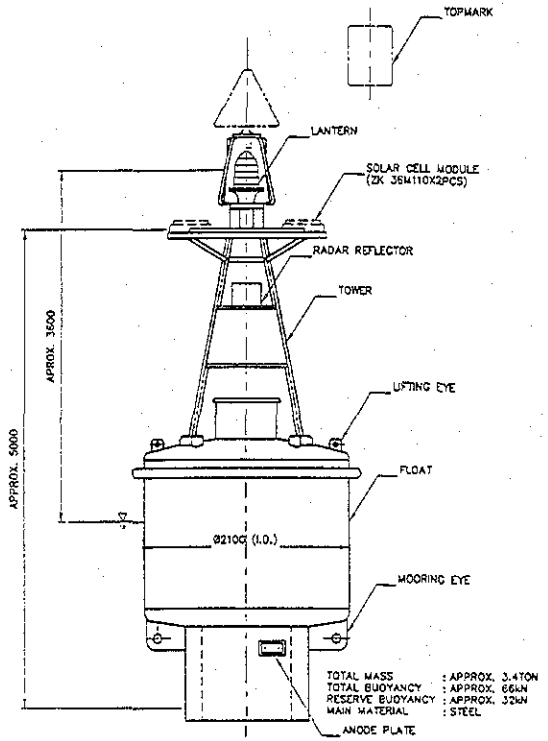
JICA — JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DETAILED DESIGN ON PORT REACTIVATION PROJECT IN LA UNION PROVINCE OF THE REPUBLIC OF EL SALVADOR	SECTION: NAVIGATION AID	DATE: JULY/2002
CEPA — COMISION EJECUTIVA PORTUARIA AUTONOMA (CEPA)	NIPPON KOEI CO., LTD.	SUB-SECTION: GENERAL	SCALE: INDICATE
		TITLE: LAYOUT OF NAVIGATION AID	DRAWING NO.



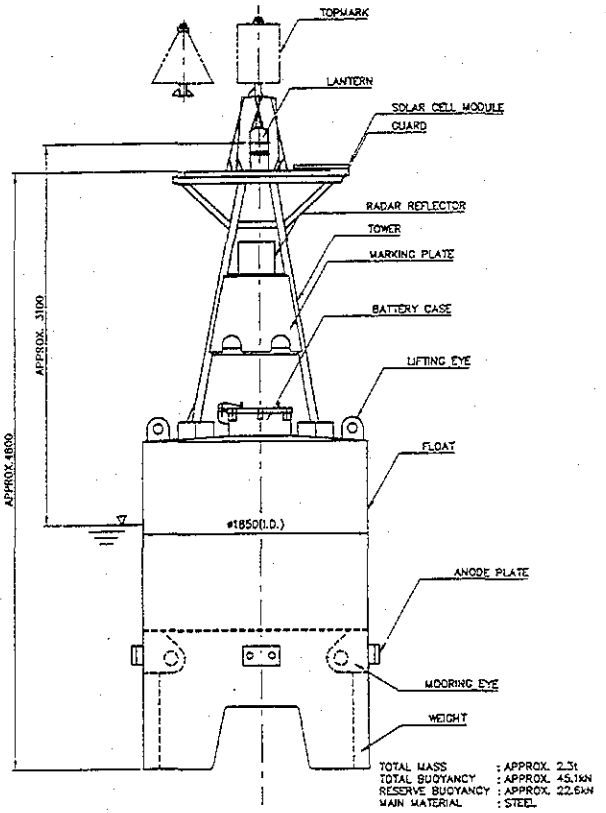
TOP VIEW OF FLOAT



OUTER CHANNEL ENTRANCE MARKER BUOY



INNER CHANNEL MARKER BUOY



BASIN MARKER BUOY

	JICA JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) Cepa COMISION EJECUTIVA PORTUARIA AUTONOMA CEPA	DETAILED DESIGN ON PORT REACTIVATION PROJECT IN LA UNION PROVINCE OF THE REPUBLIC OF EL SALVADOR NIPPON KOEI CO., LTD.	DESIGNED BY : CHECKED BY : APPROVED BY	SECTION : NAVIGATION AIDS SUB-SECTION : MARKER BUOY TITLE : MARKER BUOY	DATE : JULY/2002 SCALE : APPROX. SCALE DRAWING NO. DW-NA-02-001

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Channel Entrance Maker Buoy	Calc. Index No.	
Subject	Maker Buoy	Page No.	Rev.

References/ Notes

2 sets

		Prepared by		Checked by	
			/ /200		/ /200

NIPPON KOEI CO.,LTD.

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Channel Entrance Maker Buoy	**Pay Item No. (BOQ)**	2I-0302
Quantity Item	Form for sinker	**Unit**	m^2

Calculation Procedure Applied

Area of form for sinker was computed based on the drawing.

References, Calculation Base and Revisions

DW-NA-02-002

Rev	Prepared by	Prepared Date	No. of Pages	Checked by	Checked Date	Reviewed by	Reviewed Date	Superseded by Calc No.
0	Karla Garcia			Mr. Inuma		Mr. Ando		
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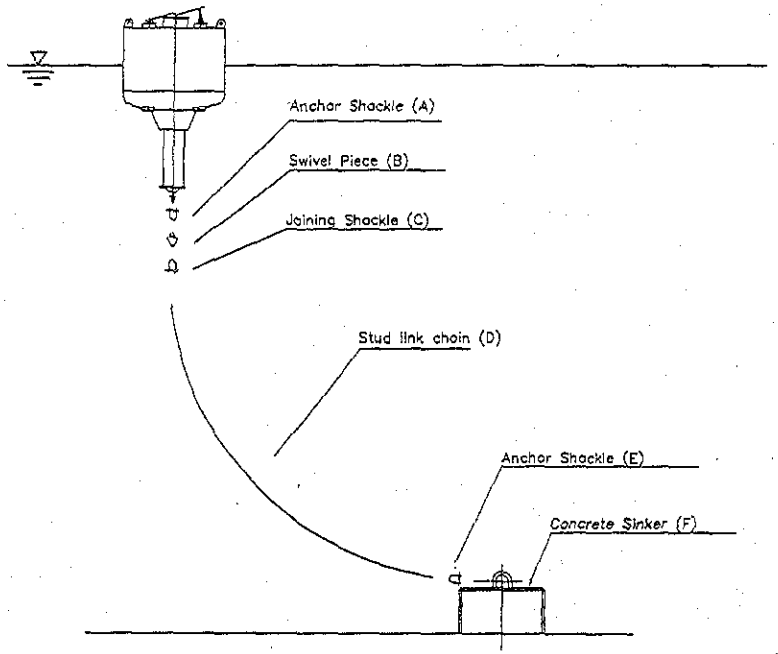
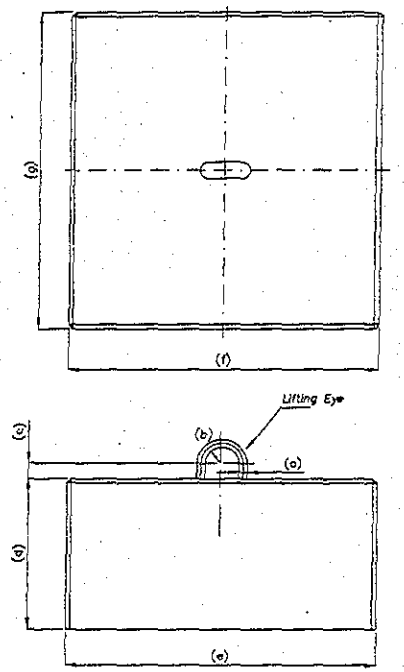




INFORMATION OF ANCHOR, CHAIN AND SINKER

ITEM	A (mm)	B (mm)	C (mm)	D (mm)	WEIGHT OF CONCRETE SINKER (t)
OUTER CHANNEL ENTRANCE MARKER BUOY	ø42	ø42	ø42	ø42	40 TON
INNER CHANNEL MARKER BUOY	ø38	ø38	ø38	ø38	7.3 TON
TURNING BASIN MARKER BUOY	ø38	ø38	ø38	ø38	7.3 TON

NOTE:

1.THE CHAIN IS MADE IN ACCORDANCE WITH JIS (JAPONESE INDUSTRIAL STANDARD), GADE 2, OR EQUIVALENT.

2.END LINKS, WICH ARE EQUIPED TO SWIVEL ENDS AND CHAIN ENDS, SHALL BE SO PROCESSED AS TO CLEAR BODY OF ANCHOR SHACKLE OF THE SAME NOMINAL DIAMETER.

3.ALL THE SHACKLE SHALL BE FIXED BY STAINLESS STELL. IT SHALL BE BENDED, AND SHACKLE PIN SHALL BE WELDED TO THE SHACKLE BODY.

INFORMATION OF CONCRETE SINKER

ITEM	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)	g (mm)	MATERIAL OF LIFTING EYE	SUITABLE SHACKLE
OUTER CHANNEL ENTRANCE MARKER BUOY	100	180	180	1600	3300	3300	3300	S45C	AS48~70
INNER CHANNEL MARKER BUOY	90	160	160	900	1900	1900	1900	S45C	AS40~64
TURNING BASIN MARKER BUOY	90	180	160	900	1900	1900	1900	S45C	AS40~64

Designed average strength after elapsed 28 days

$\sigma ck \geq 18N/mm^2$

Density :
2.3 t/m^3

REV. NO.	DATE	COORDINATE	BY	APPROVED	DATE

JICA JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

CEPA COMISION EJECUTIVA PORTUARIA AUTONOMA (CEPA)

THE DETAILED DESIGN ON PORT REACTIVATION PROJECT IN LA UNION PROVINCE OF THE REPUBLIC OF EL SALVADOR

NIPPON KOEI CO., LTD.

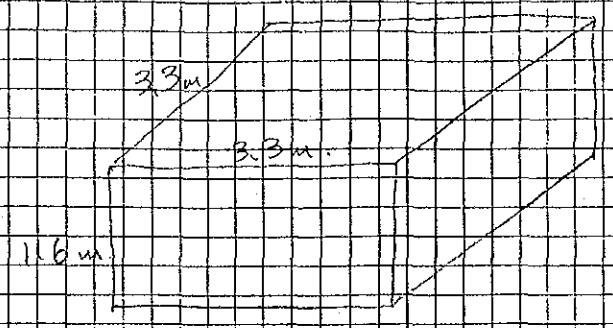
DESIGNED BY :
CHECKED BY :
APPROVED BY :

SECTION : NAVIGATION AID
SUB-SECTION : MARKER BOUY
TITLE : DETAIL OF ANCHOR, CHAIN & SINKER

DATE : AUGUST/2002
SCALE : AS INDICATED
DRAWING NO. NA-02-002

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Channel Entrance Maker Buoy	Calc. Index No.	
Subject	Form for sinker	Page No.	Rev.

References/ Notes



$A_1 = 3.3 \times 4 \times 1.6 = 21.12$

$\simeq 21.2\ m^2$

$N = 2$

$A_T = 21.2 \times 2 = \boxed{42.4}\ m^2$

		Prepared by		Checked by	
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NIPPON KOEI CO.,LTD.

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Channel Entrance Maker Buoy	**Pay Item No. (BOQ)**	2I-0303
Quantity Item	Concrete for sinker	**Unit**	m^3

Calculation Procedure Applied

Concrete volume for sinker was computed based on the drawing.

References. Calculation Base and Revisions

See the last item. (2I-0302)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Garcia			Mr. Inuma		Mr. Ando		
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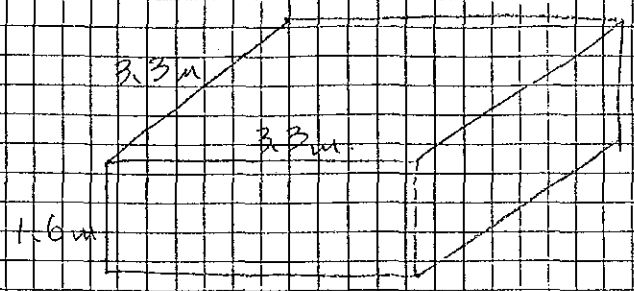
Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Channel Entrance Maker Buoy	Calc. Index No.	
Subject	Concrete for sinker	Page No.	Rev.

References/ Notes



$V_1 = 3.3 \times 3.3 \times 1.6 = 17.424$

$\simeq 17.5\ m^3$

$N = 2$

$V = 17.5 \times 2 = \boxed{35.0}\ m^3$

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NIPPON KOEI CO.,LTD.

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Channel Entrance Maker Buoy	**Pay Item No. (BOQ)**	2I-0304
Quantity Item	Lifting Bar (SUS 304)	**Unit**	kg

Calculation Procedure Applied

Weight of lifting bar was computed by multiplying unit weight by the length. Unit weight of stainless steel was to be 7930 kg/m³.

References. Calculation Base and Revisions

See the item of form for sinker.

(2I - 0302)

Rev	Prepared by	Prepared Date	No. of Pages	Checked by	Checked Date	Reviewed by	Reviewed Date	Superseded by Calc No.
0	Karla Garcia			Mr. Inuma		Mr. Ando		
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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Channel Entrance Maker Buoy	Calc. Index No.	
Subject	Lifting Bar	Page No.	Rev.

References/ Notes

$W_R = \pi \times 0.05^2 \times 1.1 \times 7930$

$= 68.48$

$\fallingdotseq 68.5$ kg

$N = 2$

$W = 68.5 \times 2 = \boxed{137}$ kg

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FN: Calculation_Sheet

NIPPON KOEI CO.,LTD.

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Channel Maker Buoy (high wave)	**Pay Item No. (BOQ)**	2I-0401
Quantity Item	Maker Buoy	**Unit**	sets

Calculation Procedure Applied

Number of channel Maker Buoy was computed based on the drawing.

References, Calculation Base and Revisions

See the item of channel entrance maker buoy.

(2I-0301)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Garcia			Mr. Inuma		Mr. Ando		
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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Channel Maker Buoy (high wave)	Calc. Index No.	
Subject	Maker Buoy	Page No.	Rev.

References/ Notes

17 sets

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FN: Calculation_Sheet

NIPPON KOEI CO.,LTD.

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Channel Maker Buoy (high wave)	**Pay Item No. (BOQ)**	2I-0403
Quantity Item	Form for sinker	**Unit**	m^2

Calculation Procedure Applied

Area of form for sinker was computed on the drawing.

References, Calculation Base and Revisions

See the item of 2I-0302.

Rev	Prepared by	Prepared Date	No. of Pages	Checked by	Checked Date	Reviewed by	Reviewed Date	Superseded by Calc No.
0	Kaila Garcia			Mr. Inuma		Mr. Ando		
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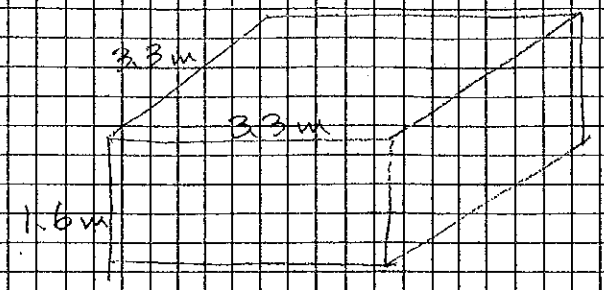
Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Channel Maker Buoy (high wave)	Calc. Index No.	
Subject	Form for sinker	Page No.	Rev.

References/ Notes



$A_1 = 3.3 \times 4 \times 1.6 = 21.12$

$\simeq 21.2\ m^2$

$N = 7$

$A_T = 21.2 \times 7 = 148.4$

$\simeq \boxed{149}\ m^2$

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NIPPON KOEI CO.,LTD.

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Channel Maker Buoy (high wave)	**Pay Item No. (BOQ)**	2I-0403
Quantity Item	Concrete for sinker	**Unit**	m^3

Calculation Procedure Applied

Concrete volume for sinker was computed on the drawing.

References, Calculation Base and Revisions

See the item of 2I-0302.

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Kaila Gonza			Mr. Inuma		Mr. Ando		
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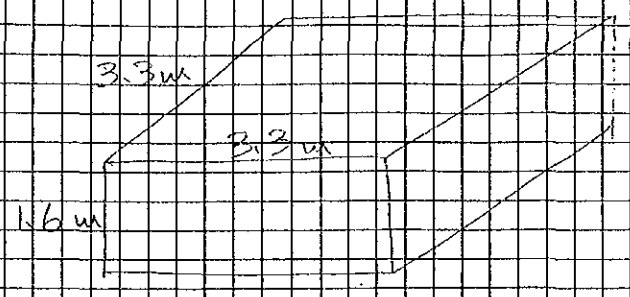
FN : Calculation_Cover_Sheet_020504_seg cover

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Channel Maker Buoy (high wave)	Calc. Index No.	
Subject	Concrete for sinker	Page No.	Rev.

References/ Notes



$V_1 = 3.3 \times 3.3 \times 1.6 = 17.424$

$\simeq 17.5\ m^3$

$N = 7$

$V = 17.5 \times 7 = 122.5$

$\simeq \boxed{123}\ m^3$

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NIPPON KOEI CO.,LTD.

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Channel Maker Buoy (high wave)	**Pay Item No. (BOQ)**	2I-0404
Quantity Item	Lifting Bar (SUS 304)	**Unit**	kg

Calculation Procedure Applied

Weight of lifting bar was computed by multiplying unit weight by the length. Unit weight of stainless steel was to be. 7930 kg/m³.

References, Calculation Base and Revisions

See the item of 2I-0302.

Rev	Prepared by	Prepared Date	No. of Pages	Checked by	Checked Date	Reviewed by	Reviewed Date	Superseded by Calc No.
0	Karla Garcia			Mr. Inoma		Mr. Ando		
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FN : Calculation_Cover_Sheet_020504_seg cover

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Channel Maker Buoy (high wave)	Calc. Index No.	
Subject	Lifting Bar	Page No.	Rev.

References/ Notes

$$W_a = \pi \times 0.05^2 \times 1.1 \times 7850$$

$$= 68.48$$

$$\fallingdotseq 68.5\ kg$$

$$N = 7$$

$$W = 68.5 \times 7 = \boxed{480}\ kg$$

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FN: Calculation_Sheet

NIPPON KOEI CO.,LTD.

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Channel Maker Buoy	**Pay Item No. (BOQ)**	2I-0501
Quantity Item	Maker Buoy	**Unit**	sets

Calculation Procedure Applied

Number of channel maker buoy was computed based on the drawing.

References. Calculation Base and Revisions

See the item of channel entrance maker buoy. (2I-0301)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Garcia			Hr. Inuma		Hr. Ando		
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FN : Calculation_Cover_Sheet_020504_seg cover

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Channel Maker Buoy	Calc. Index No.	
Subject	Maker Buoy	Page No.	Rev.

References/ Notes

$\boxed{5}$ sets.

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NIPPON KOEI CO.,LTD.

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Channel Maker Buoy	**Pay Item No. (BOQ)**	2I-0502
Quantity Item	Form for sinker	**Unit**	m^2

Calculation Procedure Applied

Area of form for sinker was computed by the drawing.

References, Calculation Base and Revisions

See the item of 2I-0302.

Rev	Prepared		No. of	Checked		Reviewed		Superseded
	by	Date	Pages	by	Date	by	Date	by Calc No.
0	Khalid Garcia			Mr. Inuma		Mr. Ando		
1								
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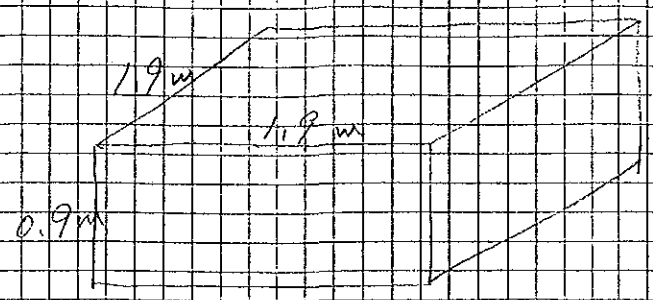
FN : Calculation_Cover_Sheet_020504_seg cover

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Channel Maker Buoy	Calc. Index No.	
Subject	Form for sinker	Page No.	Rev.

References/ Notes



$A_1 = 1.9 \times 4 \times 0.9 = 6.84\ m^2$

$N = 5$

$A = 6.84 \times 5 = \boxed{34.2}\ m^2$

		Prepared by		Checked by	
			/ /200		/ /200

FN: Calculation_Sheet

NIPPON KOEI CO.,LTD.

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Channel Maker Buoy	**Pay Item No. (BOQ)**	2I-0503
Quantity Item	Concrete for sinker	**Unit**	m^3

Calculation Procedure Applied

Concrete volume for sinker was computed by the drawing.

References, Calculation Base and Revisions

See the item of 2I-0302.

Rev	Prepared by	Prepared Date	No. of Pages	Checked by	Checked Date	Reviewed by	Reviewed Date	Superseded by Calc No.
0	Karla Garcia			Mr. Inuma		Mr. Ando		
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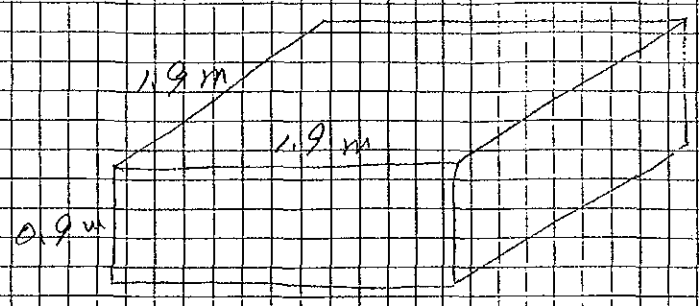
Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Channel Maker Buoy	Calc. Index No.	
Subject	Concrete for sinker	Page No.	Rev.

References/ Notes



$V_1 = 1.9 \times 1.9 \times 0.9$

$= 3.25 \ m^3$

$N = 5$

$V = 3.25 \times 5 = 16.25$

$\simeq \boxed{16.3} \ m^3$

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NIPPON KOEI CO.,LTD.

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Channel Maker Buoy	**Pay Item No. (BOQ)**	2I-0504
Quantity Item	Lifting Bar (SUS 304)	**Unit**	kg

Calculation Procedure Applied

Weight of lifting bar was computed by multiplying unit weight by the length. Unit weight of stainless steel was to be 7930 kg/m³.

References, Calculation Base and Revisions

See the item of 2I-0302.

Rev	Prepared by	Prepared Date	No. of Pages	Checked by	Checked Date	Reviewed by	Reviewed Date	Superseded by Calc No.
0	Karla Garcia			Mr. Inuma		Mr. Ando		
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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Channel Maker Buoy	Calc. Index No.	
Subject	Lifting Bar	Page No.	Rev.

References/ Notes

$W_b = \pi \times 0.045^2 \times 1.0 \times 7850$

$= 50.5$ kg

$N = 5$

$W = 50.5 \times 5 = \boxed{253}$ kg

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Turning Basin Maker Buoy	**Pay Item No. (BOQ)**	2I-0601
Quantity Item	Maker Buoy	**Unit**	sets

Calculation Procedure Applied

Number of turning basin maker buoy was computed based on the drawing.

References, Calculation Base and Revisions

See the item of channel entrance maker buoy. (2I-0301)

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0	Maria Garcia			Mr. Inoma		Mr. Ando		
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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Turning Basin Maker Buoy	Calc. Index No.	
Subject	Maker Buoy	Page No.	Rev.

References/ Notes

2 sets

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Turning Basin Maker Buoy	**Pay Item No. (BOQ)**	2I-0602
Quantity Item	Form for sinker	**Unit**	m^2

Calculation Procedure Applied

Area of form for sinker was computed by the drawing.

References, Calculation Base and Revisions

See the item of 2I-0302.

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0	Kato Gario			Mr. Inuma		Mr. Ando		
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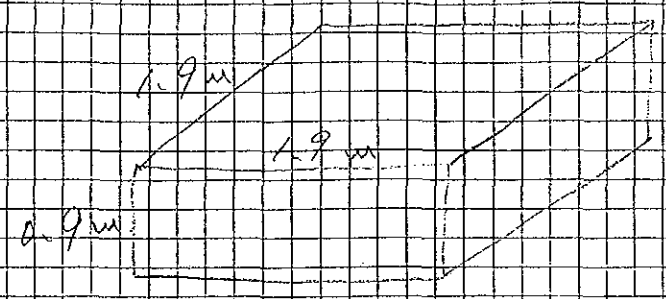
Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Turning Basin Maker Buoy	Calc. Index No.	
Subject	Form for sinker	Page No.	Rev.

References/ Notes



$A_1 = 1.9 \times 4 \times 0.9 = 6.84 m^2$

$N = 2$

$A = 6.84 \times 2 = 13.68$

$= \boxed{13.7} m^2$

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Turning Basin Maker Buoy	**Pay Item No. (BOQ)**	2I-0603
Quantity Item	Concrete for sinker	**Unit**	m^3

Calculation Procedure Applied

Concrete volume for sinker was computed by the drawing.

References, Calculation Base and Revisions

See the item of 2I-0302.

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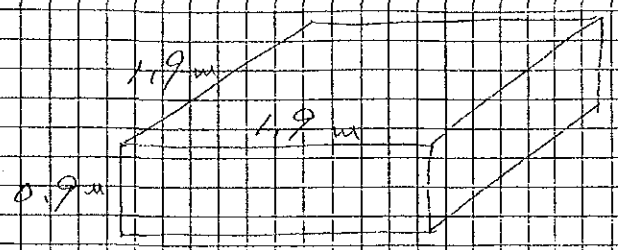
Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Turning Basin Maker Booy	Calc. Index No.	
Subject	Concrete for sinker	Page No.	Rev.

References/ Notes



$V_1 = 1.9 \times 1.9 \times 0.9$

$= 3.25\ m^3$

$N = 2$

$V = 3.25 \times 2 = \boxed{6.5}\ m^3$

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Turning Basin Maker Buoy	**Pay Item No. (BOQ)**	2I-0604
Quantity Item	Lifting Bar (SUS 304)	**Unit**	kg

Calculation Procedure Applied

Weight of lifting bar was computed by multiplying unit weight by the length. Unit weight of stainless steel was to be 7930 kg/m³.

References, Calculation Base and Revisions

See the item of 2I-0302.

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
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0	Karlo Garcia			Mr. Inuma		Mr. Ando		
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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Turning Basin Maker Buoy	Calc. Index No.	
Subject	Lifting Bar	Page No.	Rev.

References/ Notes

$W_b = \pi \times 0.045^2 \times 1.0 \times 7850$

$= 50.5\ kg$

$N = 2$

$W = 50.5 \times 2 = \boxed{101}\ kg$

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NIPPON KOEI CO.,LTD.

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Security Fence	**Pay Item No. (BOQ)**	2J -01
Quantity Item	Excavation	**Unit**	m^3

Calculation Procedure Applied

Volume of excavation for security fence was computed by multiplying unit volume by nombers.

References, Calculation Base and Revisions

DW - RV - 00 - 005

DW - RV - 03 - 006

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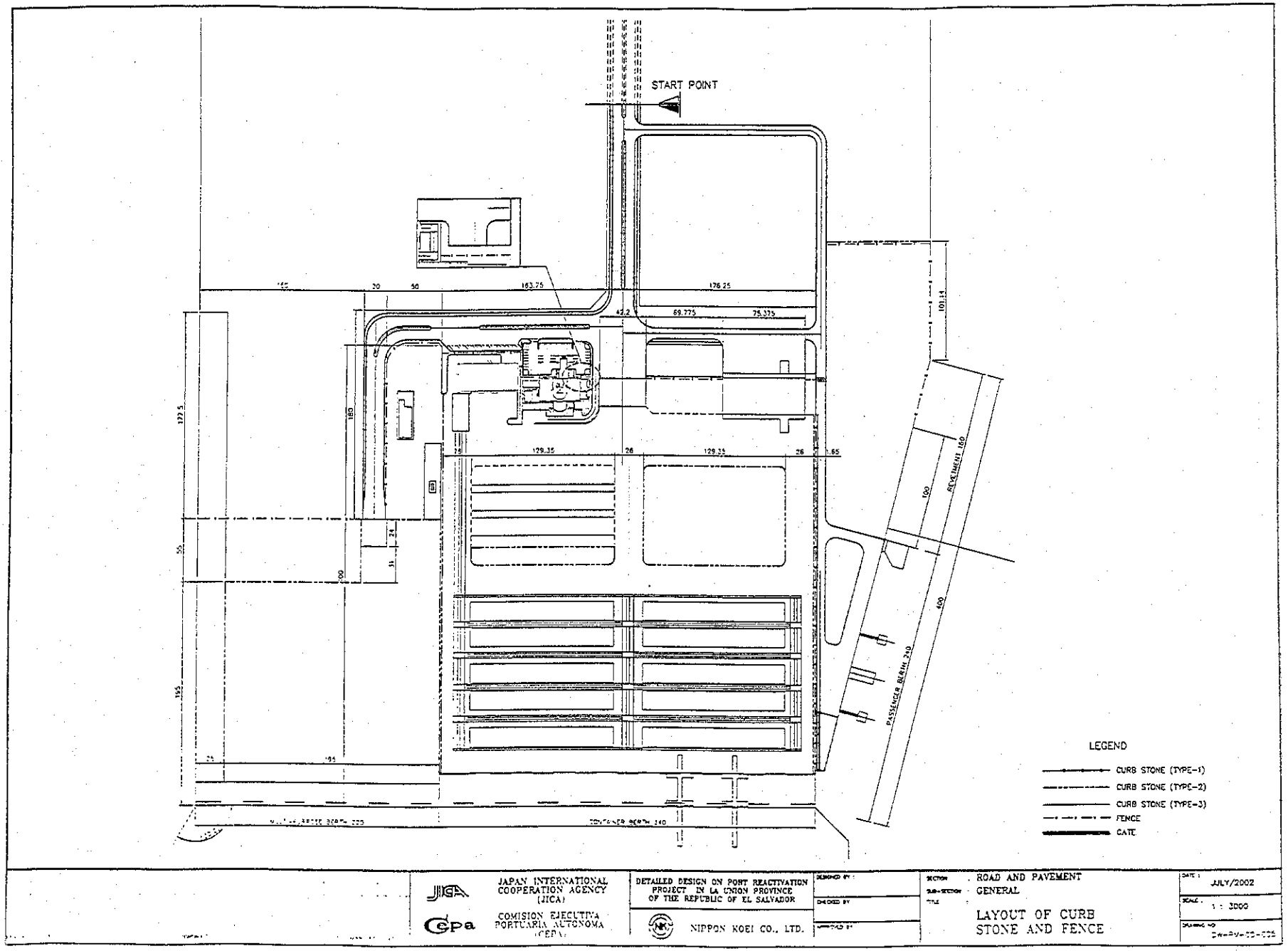
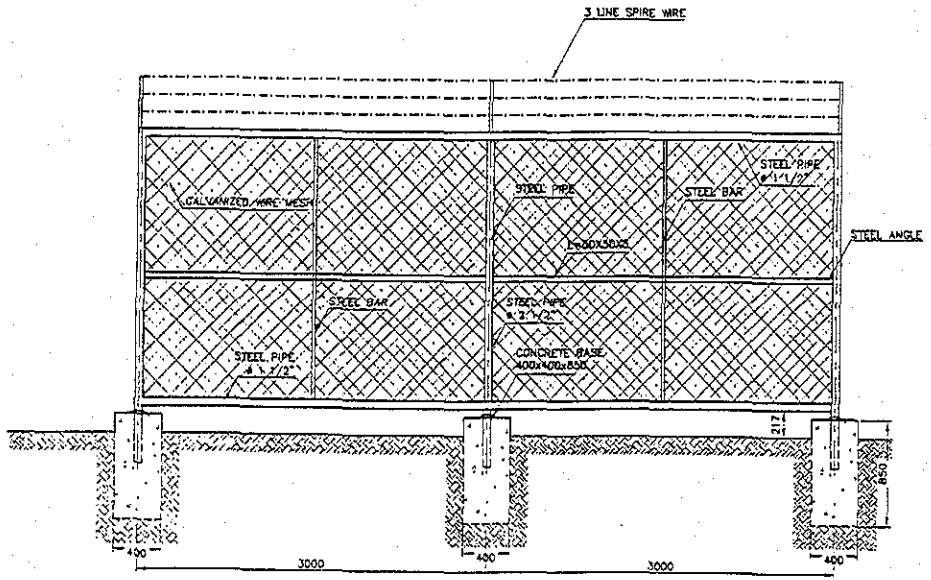
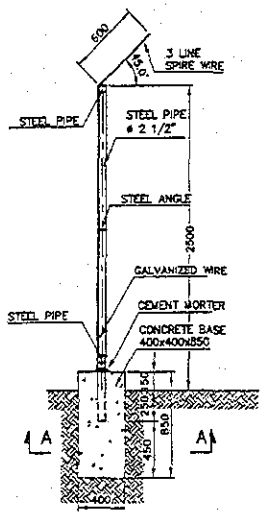
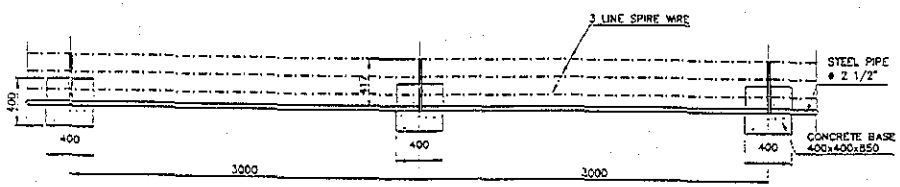

START POINT
LEGEND
CURB STONE (TYPE-1)
CURB STONE (TYPE-2)
CURB STONE (TYPE-3)
FENCE
GATE
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
COMISION EJECUTIVA PORTUARIA AUTONOMA (CEPA)
DETAILED DESIGN ON PORT REACTIVATION PROJECT IN LA UNION PROVINCE OF THE REPUBLIC OF EL SALVADOR
NIPPON KOEI CO., LTD.
SECTION : ROAD AND PAVEMENT
SUB-SECTION : GENERAL
TITLE : LAYOUT OF CURB STONE AND FENCE
DATE : JULY/2002
SCALE : 1 : 3000



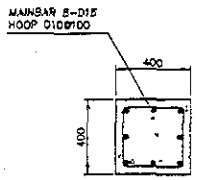
SECURITY FENCE ELEVATION
SCALE 1:40



SECTION
SCALE 1:40



SECURITY FENCE PLAN
SCALE 1:40

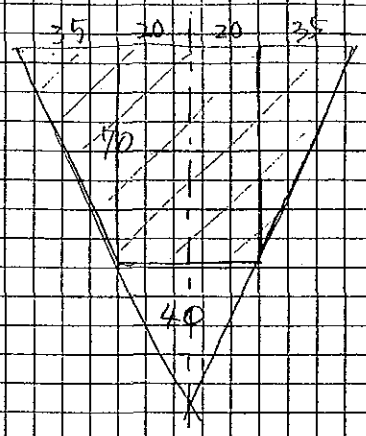


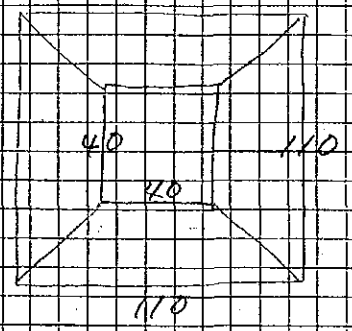
SECTION A–A
SCALE 1:25

JICA / CEPA	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) / COMISION EJECUTIVA PORTUARIA AUTONOMA (CEPA)	DETAILED DESIGN ON PORT REACTIVATION PROJECT IN LA UNION PROVINCE OF THE REPUBLIC OF EL SALVADOR / NIPPON KOEI CO., LTD.	DESIGNED BY / CHECKED BY / APPROVED BY	SECTION : ROAD AND PAVEMENT SUB-SECTION : INCIDENTAL WORK TITLE : DETAIL OF SECURITY FENCE	DATE : JULY/2002 SCALE : INDICATED DRAWING NO : DW-5/-03-776

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Security Fence.	Calc. Index No.	
Subject	Excavation	Page No.	Rev.

References/ Notes





$V_{EX} = 1.1 \times 1.1 \times 1.1 \div 3 - 0.4 \times 0.4 \times 0.4 \div 3$

$= 0.423\ m^3$

$L = \cancel{1320}\ \cancel{m}\ \ 1362\ m$

$N = \cancel{1320} \div 3 = \cancel{440}\ \ 454$

$V = 0.423 \times \cancel{440}\ 454$

$= \boxed{\cancel{192}}\ m^3$

192

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Security Fence	**Pay Item No. (BOQ)**	2J-02
Quantity Item	Concrete	**Unit**	m^3

Calculation Procedure Applied

Volume of concrete for security fence was computed by multiplying unit volume by numbers.

References, Calculation Base and Revisions

See the item of excavation of security fence. (2J-01)

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	by	Date		by	Date	by	Date	
0	Karla Garcia			Mr. Inuma		Mr. Ando		
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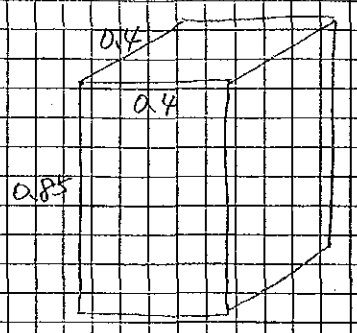
Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Security Fence	Calc. Index No.	
Subject	Concrete	Page No.	Rev.

References/ Notes



$V_1 = 0.4 \times 0.4 \times 0.85 = 0.136$

$\approx 0.14\ m^3$

$L = \frac{1362}{\cancel{1302}}\ m \div 3\ m$

$N = \frac{1362}{\cancel{1302}} \div 3 = \frac{454}{\cancel{434}}$

$V = 0.14 \times \frac{454}{\cancel{434}} = \boxed{\cancel{60.8}\ \ 63.6}\ m^3$

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Security Fence	**Pay Item No. (BOQ)**	2J-03
Quantity Item	Form	**Unit**	m^2

Calculation Procedure Applied

Area of form for security fence was computed by multiplying unit area by numbers.

References, Calculation Base and Revisions

See the item of excavation of security fence. (2J-01)

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0	Karla Garcia			Mr. Inuma		Mr. Ando		
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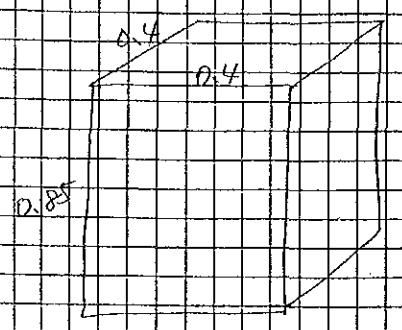
Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Security Fence	Calc. Index No.	
Subject	Form	Page No.	Rev.

References/ Notes



Side

$0.4 \times 4 \times 0.85 = 1.36\ m^2$

bottom $0.4 \times 0.4 = 0.16\ m^2$

$A_1 = 1.36 + 0.16 = 1.52\ m^2$

$N = \cancel{1.362} \div 3 = \cancel{454}$ 454

$A = 1.52 \times \cancel{454}$ 454

$= \boxed{\cancel{690.0}}\ m^2$

690.0

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Security Fence	**Pay Item No. (BOQ)**	2J-04
Quantity Item	Re-Bar	**Unit**	kg

Calculation Procedure Applied

Weight of re-bar was computed for base concrete of security fence by multiplying unit weight by numbers.

References, Calculation Base and Revisions

See the item of excavation of security fence. (2J-01)

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0	Karla Garão			Mr. Inuma		Mr. Ando		
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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Security Fence	Calc. Index No.	
Subject	Re – Bar	Page No.	Rev.

References/ Notes

D16 : 1.56 kg/m × 0.75 m × 8

= 9.36 kg

D10 : 0.56 kg/m × 1.0 m × 9

= 5.04

W_1 = 9.36 + 5.04 = 14.4 kg

N = ~~434~~ 454

W = 14.4 × ~~434~~ 454 = ~~6250~~ kg

6540

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Security Fence	**Pay Item No. (BOQ)**	2J-05
Quantity Item	Backfill	**Unit**	m^3

Calculation Procedure Applied

Volume of backfill sand for Security fence was computed by multiplying unit volume by numbers.

Backfill volume equals excavation volume minus concrete volume below ground level.

References, Calculation Base and Revisions

See the item of excavation of security fence. (2J-01)

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0	Kanto Gorra			Mr. Tsuma		Mr. Sado		
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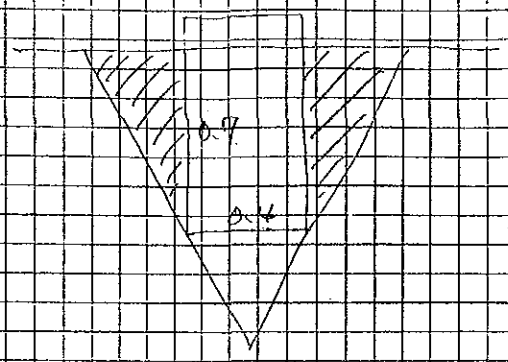
Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Security Fence	Calc. Index No.	
Subject	Backfill	Page No.	Rev.

References/ Notes



Excavation volume 0.423 m^2

Concrete below ground

$0.4 \times 0.4 \times 0.7 = 0.112\ m^3$

Backfill $0.423 - 0.112 = 0.311\ m^3$

$N = \cancel{434}\ 454$

$V = 0.311 \times \cancel{434}\ 454$

$= \boxed{\cancel{135}\ 142}\ m^3$

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Security Fence	**Pay Item No. (BOQ)**	2J-06
Quantity Item	Compaction	**Unit**	m^2

Calculation Procedure Applied

Area of compaction for security fence was computed by multiplying unit area by numbers.

References. Calculation Base and Revisions

See the item of excavation of security fence. (2J-01)

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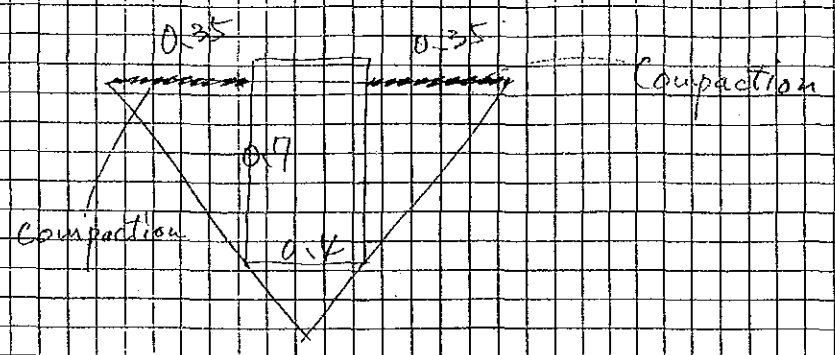
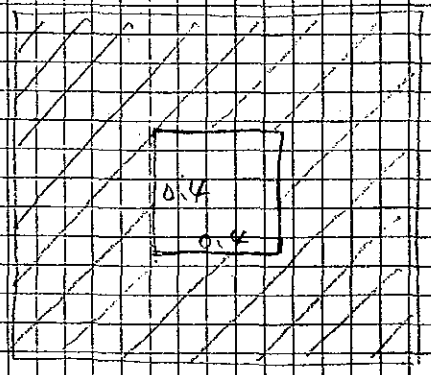
Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Security Fence	Calc. Index No.	
Subject	Compaction	Page No.	Rev.

References/ Notes





1.1

$A_1 = 1.1 \times 1.1 - 0.4 \times 0.4$

$= 1.05\ m^2$

$N = \cancel{434}\ 454$

$A = 1.05 \times \cancel{434}\ 454$

$= \cancel{455.7}\ 476.7$

$\simeq \boxed{\cancel{456}\ 477}\ m^2$

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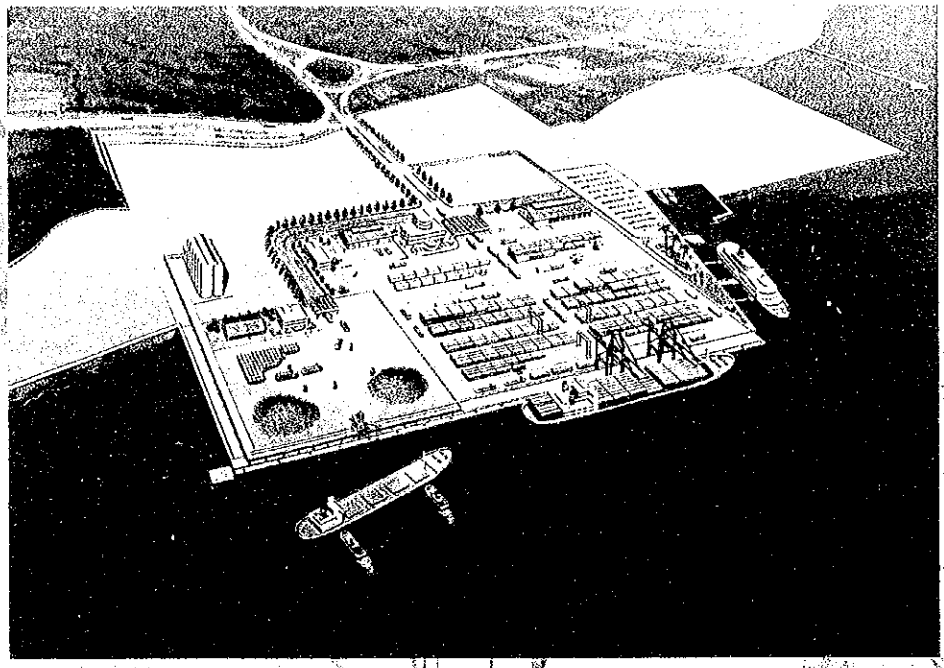

JICA