

QUANTITY CALCULATION COVER SHEET


Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	
Work Section Title	Excavation for reclamation from Zone B	Pay Item No. (BOQ)	
Quantity Item		Unit	cubic meter

Calculation Procedure Applied

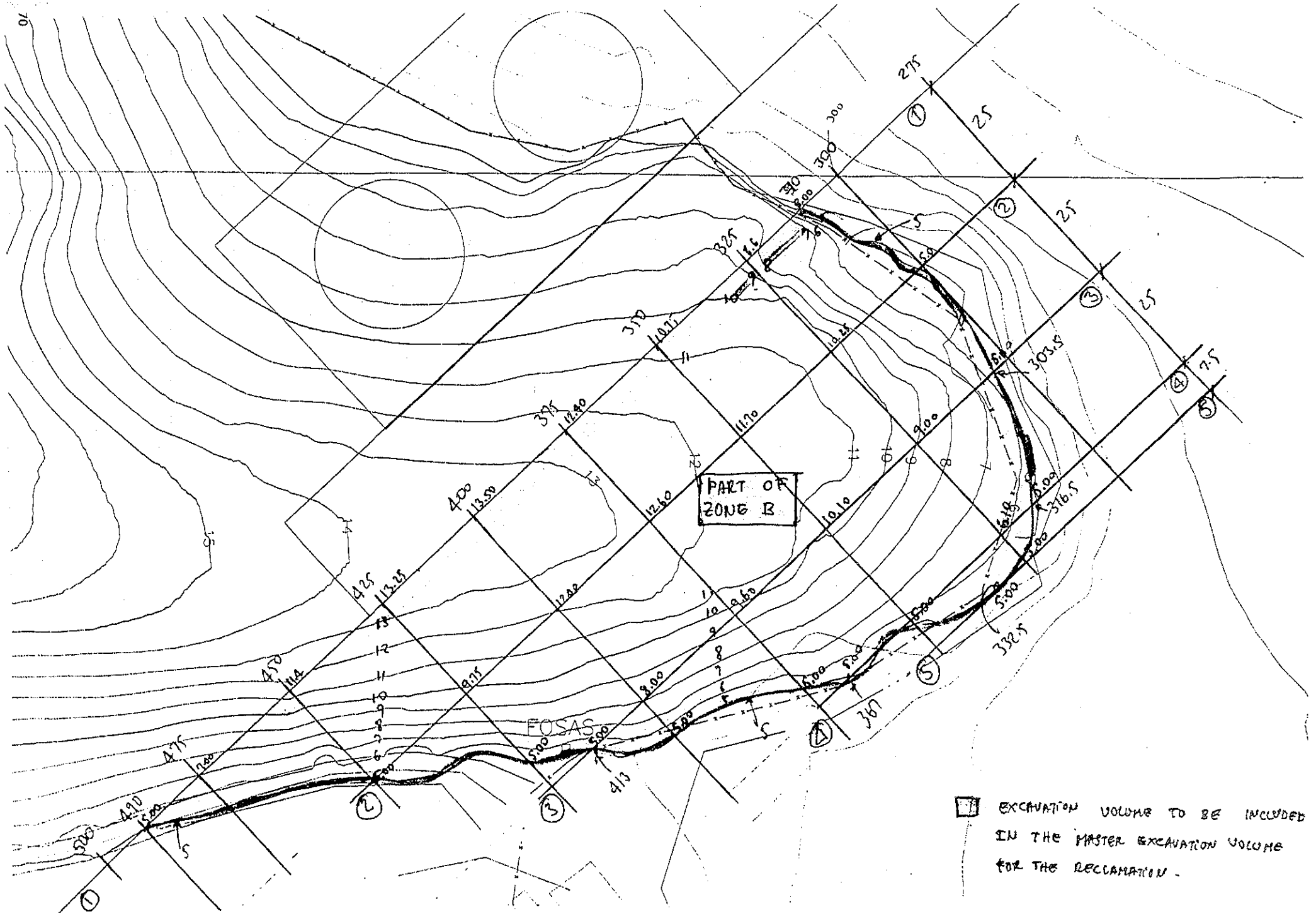
1. Calculation of area of sections (Excel)
2. Average Area of Sections (Excel)
3. Calculation of volume: average of area of sections times distance between sections (Excel)

References, Calculation Base and Revisions

1. Area and Volume have been calculated starting from section 1 to section 5, in accordance to enclosed drawing.
2. The final elevation after excavation shall be +5.00 meters.

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
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0	 jam	18 June 2002	8					
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File in Calc. File



PART OF ZONE B

EXCAVATION VOLUME TO BE INCLUDED IN THE MASTER EXCAVATION VOLUME FOR THE RECLAMATION.

VOLUME OF EXCAVATION FOR RECLAMATION FROM ZONE B
 June 18/2002

SECTION N°	AREA	AVERAGE AREA OF 2 SECTIONS	DISTANCE BETWEEN SECTIONS	VOLUME
1	1,019.50	901.00	25.00	22,525
2	782.50	587.50	25.00	14,688
3	392.50	205.60	25.00	5,140
4	18.70	9.35	7.50	70
5	0.00			

VOLUME OF EXCAVATION FOR RECLAMATION FROM ZONE B: 42,423 m³

Planned elevation	Natural ground elevation	Difference of elevation: $c = b - a$	Average of elevations	Width: d	area: $e = c \cdot d$
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Section N°
1

distance	a	b	c	c'	d	e
310	5.00	5.00	0.00			
				1.80	15.00	27.00
325	5.00	8.60	3.60			
				4.68	25.00	116.88
350	5.00	10.75	5.75			
				6.58	25.00	164.38
375	5.00	12.40	7.40			
				7.95	25.00	198.75
400	5.00	13.50	8.50			
				8.38	25.00	209.38
425	5.00	13.25	8.25			
				7.33	25.00	183.13
450	5.00	11.40	6.40			
				4.20	25.00	105.00
475	5.00	7.00	2.00			
				1.00	15.00	15.00
490	5.00	5.00	0.00			

AREA OF SECTION: 1,019.50 m²

Planned elevation	Natural ground elevation	Difference of elevation: $c = b - a$	Average of elevations	Width: d	area: $e = c \cdot d$
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Section N°
2

distance	a	b	c	c'	d	e
300	5.00	5.00	0.00			
				2.63	25.00	65.63
325	5.00	10.25	5.25			
				5.98	25.00	149.38
350	5.00	11.70	6.70			
				7.15	25.00	178.75
375	5.00	12.60	7.60			
				7.30	25.00	182.50
400	5.00	12.00	7.00			
				5.88	25.00	146.88
425	5.00	9.75	4.75			
				2.38	25.00	59.38
450	5.00	5.00	0.00			

AREA OF SECTION: 782.50 m²

Planned elevation	Natural ground elevation	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c*d
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Section N°
3

distance	a	b	c	c'	d	e
303.5	5.00	5.00	0.00			
				2.00	21.50	43.00
325	5.00	9.00	4.00			
				4.55	25.00	113.75
350	5.00	10.10	5.10			
				4.85	25.00	121.25
375	5.00	9.60	4.60			
				3.80	25.00	95.00
400	5.00	8.00	3.00			
				1.50	13.00	19.50
413	5.00	5.00	0.00			

AREA OF SECTION: 392.50 m²

Planned elevation	Natural ground elevation	Difference of elevation: $c = b - a$	Average of elevations	Width: d	area: $e = c \cdot d$
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Section N°
4

distance	a	b	c	c'	d	e
316.5	5.00	5.00	0.00			
				0.55	9.00	4.95
325	5.00	6.10	1.10			
				0.55	25.00	13.75
350	5.00	5.00	0.00			
				0.00	25.00	0.00
367	5.00	5.00	0.00			


AREA OF SECTION: 18.70 m²

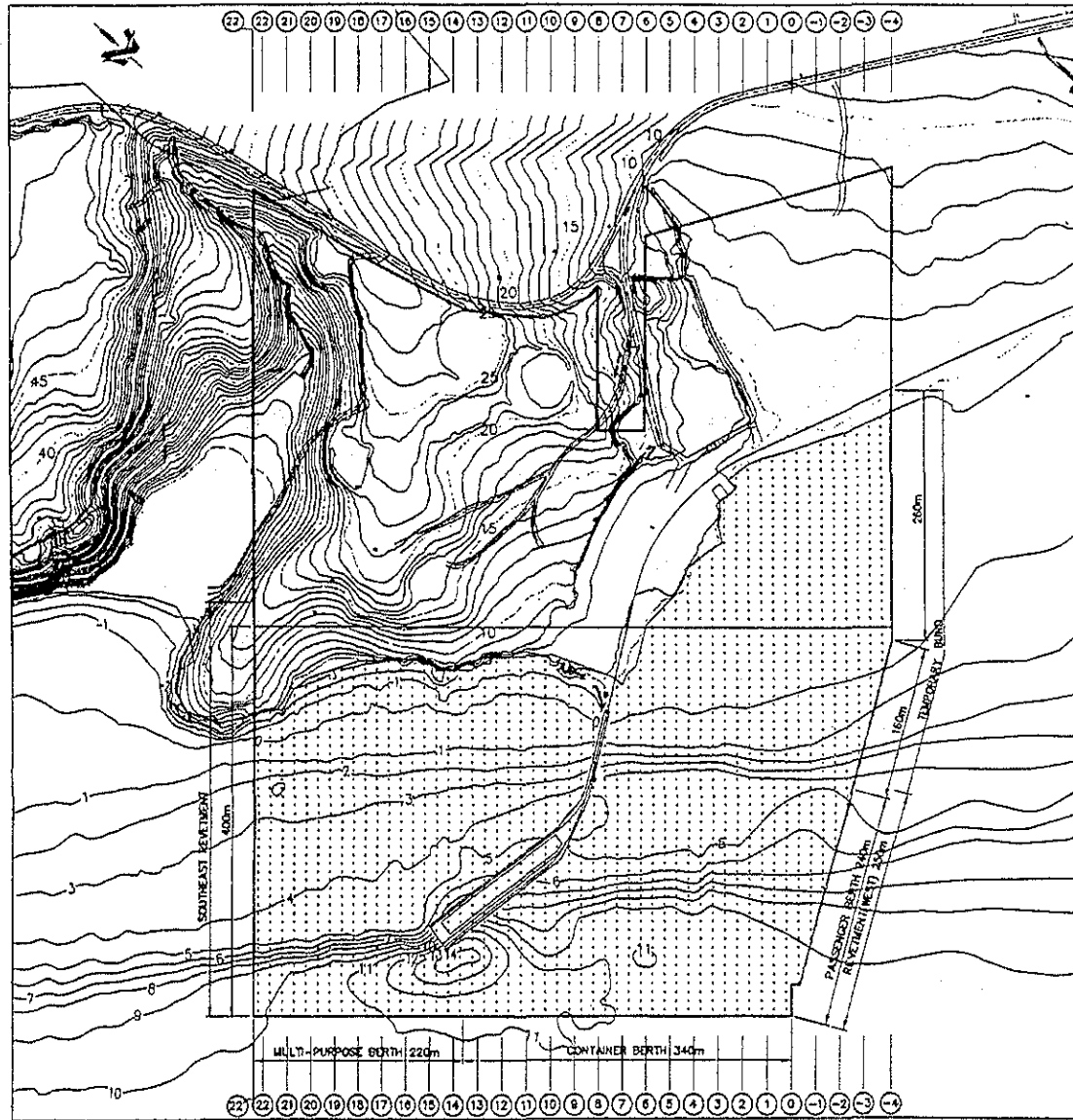
Planned elevation	Natural ground elevation	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c*d
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Section N°
5

distance	a	b	c	c'	d	e
325	5.00	5.00	0.00			
				0.00	24.00	0.00
332.5	5.00	5.00	0.00			

AREA OF SECTION: 0.00 m²


QUANTITY CALCULATION COVER SHEET								
Project	Detailed Design on Port Reactivation Project in La Union Province			Project Code	JC1N004/2N001			
Work Section Title	Land Reclamation			Pay Item No. (BOQ)				
Quantity Item	Removal of Surface Soil			Unit	m ³ .			
Calculation Procedure Applied								
<p>Removal of Surface Soil was computed for Excavation area. The area was computed in AutoCAD and multiplied by 0.35m.</p>								
References, Calculation Base and Revisions								
<p>DW - DR - 00 - 005</p>								
Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
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LEGEND:
 RECLAMATION AREA

DATE	COORDINATE	BY	APPROVED	DATE

JICA
 JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
Cpa
 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 : DREGING AND RECLAMATION WORK
 SUB-SECTION : GENERAL
 TITLE : PLAN OF RECLAMATION

DATE : JUNE/2002
 SCALE : 1 : 5,000
 DRAWING NO : DW-DR-00-005

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section		Calc. Index No.	
Subject	Removal of Surface Soil	Page No.	Rev.
<p>Removal Area</p> $A = 239,501.50 \text{ m}^2$ $V = 239,501.50 \times 0.35$ $= 83,825.53$ $\approx 84,000 \text{ m}^3$			References/Notes
		Prepared by	
		/ /200	Checked by
			/ /200

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Land Reclamation	Pay Item No. (BOQ)	2F-0201
Quantity Item	Reclamation Area	Unit	m ³

Calculation Procedure Applied (by Dredged material.)

Excavated material and dredged material will be used for land reclamation. So, reclamation volume by dredged material was computed as the deduction of excavated volume from reclamation volume.

References, Calculation Base and Revisions

See the last item of fill material supply (2F-01)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Land Reclamation	Calc. Index No.	
Subject	Reclamation Area	Page No.	Rev.
Reclamation volume		References/Notes	
below #45m	3070.000 m ³		
above #45m	68.000 m ³		
Embankment of road	9.300 m ³		
	3,105,250 m ³		
Substructure			
West Revetment	55,000 m ³		
East Revetment	40,500 m ³		
West Bund	3,200 m ³		
East Bund	1,000 m ³		
Actual volume	0,000,000 m ³		
Fill Material (Land excavation)	1,510,000 m ³		
Imported Material	1,527,000 m ³		
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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	
Work Section Title	Reclamation Work	Pay Item No. (BOQ)	
Quantity Item	Land reclamation	Unit	cubic meter

Calculation Procedure Applied

1. Calculation of Area of sections (Excel).
2. Average Area of Sections (Excel).
3. Calculation of volume: Average of area of sections times distance between sections (Excel).
4. Three groups of volumes (as described below) were calculated to obtain the final volume of reclamation.

References. Calculation Base and Revisions

1. Area and Volume have been calculated starting from section -4 to section 22', in accordance with the Reclamation and Excavation Plan No. DW-RD-00-05.
2. Design Information:
Height of reclamation: +4.50 meters
3. The major Volume of Reclamation was calculated starting at 50 meters measured from the side of the Caissons that touches the sea towards in-land.
4. The next volume of reclamation was calculated between the Caissons up to 50 meters towards in-land.

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	
Work Section Title	Reclamation Work	Pay Item No. (BOQ)	
Quantity Item	Land reclamation	Unit	cubic meter

Calculation Procedure Applied

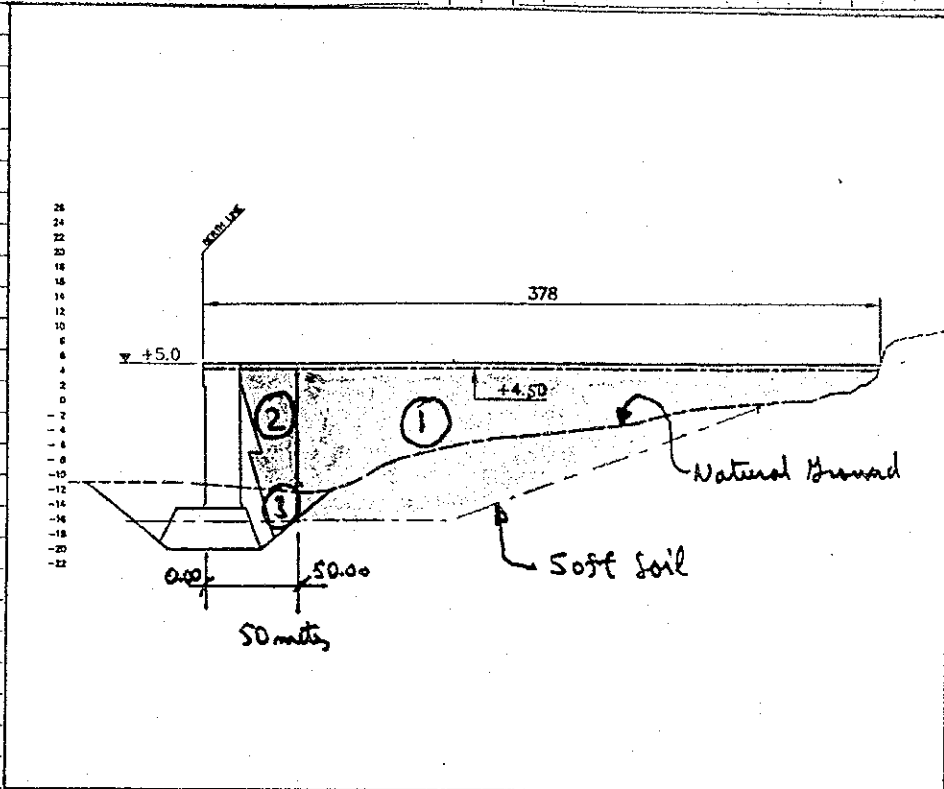
References. Calculation Base and Revisions

5. Also the volume of reclamation below natural ground (excavation to be done for construction purpose of caissons) behind caissons was calculated.

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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Detail of Reclamation Volume.	Calc. Index No.	
Subject		Page No.	Rev.



References/
Notes

- 1. Volume reclamation area from 50.00 towards the land.
- 2. Volume behind caissons up to natural ground from 0.00 up to 50.00 meters towards the land.
- 3. Volume below natural ground up to bottom of soft soil from 0.00 up to 50.00 meters behind caissons.

Prepared by		Checked by	
JAM	28 / 12 / 2002		/ / 200

VOLUME RECLAMATION AREA
JULY 10/2002 INCLUDING SOFT SOIL RECLAMATION

SECTION N°	AREA	AVERAGE AREA OF 2 SECTIONS	DISTANCE BETWEEN SECTIONS	VOLUME
-4	941.46			
		1,488.75	28.78	42,846
-3	2,036.05			
		2,778.12	25.00	69,453
-2	3,520.19			
		4,406.00	25.00	110,150
-1	5,291.80			
		6,044.88	25.00	151,122
0	6,797.96			
		6,624.91	25.00	165,623
1	6,451.87			
		6,347.48	25.00	158,687
2	6,243.10			
		6,112.55	25.00	152,814
3	5,982.00			
		5,930.79	25.00	148,270
4	5,879.58			
		5,352.69	25.00	133,817
5	4,825.80			
		4,364.39	25.00	109,110
6	3,902.97			
		3,861.08	25.00	96,527
7	3,819.18			
		3,715.97	25.00	92,899
8	3,612.75			
		3,669.38	25.00	91,734
9	3,726.00			
		3,805.81	25.00	95,145
10	3,885.63			
		3,901.13	25.00	97,528
11	3,916.63			
		4,001.67	25.00	100,042
12	4,086.72			
		4,172.37	25.00	104,309
13	4,258.02			
		4,274.17	25.00	106,854
14	4,290.32			
		4,179.25	25.00	104,481
15	4,068.19			
		3,899.12	25.00	97,478
16	3,730.05			
		3,604.73	25.00	90,118
17	3,479.40			
		3,397.95	25.00	84,949
18	3,316.50			
		3,279.14	25.00	81,978
19	3,241.78			
		3,222.55	25.00	80,564
20	3,203.33			
		3,219.42	25.00	80,485
21	3,235.51			
		3,274.32	25.00	81,858
22	3,313.13			
		3,785.81	10.00	37,858
22'	4,258.49			

VOLUME RECLAMATION AREA (from 50.00 towards in-land) :	2,766,700 m ³
PLUS VOLUME BEHIND CAISSONS (up to natural ground from 0.00 up to 50.00 towards in-land):	207,389 m ³
VOLUME BELOW NATURAL GROUND UP TO BOTTOM OF SOF SOIL FROM 0.00-50.00 BEHIND CAISSONS:	57,553 m ³
MINUS VOLUME OF WEST REVETMENT THAT GOES INTO RECLAMATION AREA:	0 m ³
MINUS VOLUME OF EAST REVETMENT THAT GOES INTO RECLAMATION AREA:	0 m ³
GRAN TOTAL:	3,031,642 m³

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c'd
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Section N°
-4

distance	a	b	c	c'	d	e
385	-1.62	4.50	6.12			
400	-0.84	4.50	5.34	5.73	15.00	85.95
425	-0.38	4.63	5.01	5.18	25.00	129.38
450	0.00	4.75	4.75	4.88	25.00	122.00
475	0.83	4.88	4.05	4.40	25.00	110.00
500	1.73	5.00	3.27	3.66	25.00	91.50
525	1.99	5.13	3.14	3.21	25.00	80.13
550	1.38	5.25	3.87	3.51	25.00	87.63
575	1.85	5.38	3.53	3.70	25.00	92.50
600	2.82	5.50	2.68	3.11	25.00	77.63
625	4.30	5.63	1.33	2.01	25.00	50.13
647	5.74	5.74	0.00	0.67	22.00	14.63

AREA OF SECTION: 941.46 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c*d
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Section N°
-3

distance	a	b	c	c'	d	e
280	-11.00	4.50	15.50			
				14.71	20.00	294.20
300	-9.42	4.50	13.92			
				12.55	25.00	313.63
325	-6.67	4.50	11.17			
				9.80	25.00	244.88
350	-3.92	4.50	8.42			
				7.42	25.00	185.50
375	-1.92	4.50	6.42			
				5.88	25.00	147.00
400	-0.84	4.50	5.34			
				5.18	25.00	129.38
425	-0.38	4.63	5.01			
				4.88	25.00	122.00
450	0.00	4.75	4.75			
				4.40	25.00	110.00
475	0.83	4.88	4.05			
				3.66	25.00	91.50
500	1.73	5.00	3.27			
				3.21	25.00	80.13
525	1.99	5.13	3.14			
				3.51	25.00	87.63
550	1.38	5.25	3.87			
				3.70	25.00	92.50
575	1.85	5.38	3.53			
				3.11	25.00	77.63
600	2.82	5.50	2.68			
				2.01	25.00	50.13
625	4.30	5.63	1.33			
				0.67	15.00	9.98
640	5.70	5.70	0.00			

AREA OF SECTION: 2,036.05 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c'd
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Section N°
-2.00

distance	a	b	c	c'	d	e
187	-15.35	4.50	19.85			
				19.68	13.00	255.78
200	-15.00	4.50	19.50			
				18.84	25.00	470.88
225	-13.67	4.50	18.17			
				17.51	25.00	437.75
250	-12.35	4.50	16.85			
				16.19	25.00	404.63
275	-11.02	4.50	15.52			
				14.86	25.00	371.50
300	-9.70	4.50	14.20			
				12.31	25.00	307.75
325	-5.92	4.50	10.42			
				8.54	25.00	213.38
350	-2.15	4.50	6.65			
				6.12	25.00	152.88
375	-1.08	4.50	5.58			
				5.33	25.00	133.25
400	-0.58	4.50	5.08			
				4.98	25.00	124.38
425	-0.12	4.75	4.87			
				4.26	25.00	106.38
450	1.24	4.88	3.64			
				3.37	25.00	84.13
475	1.91	5.00	3.09			
				3.03	25.00	75.63
500	2.17	5.13	2.96			
				3.28	25.00	81.88
525	1.66	5.25	3.59			
				3.71	25.00	92.75
550	1.55	5.38	3.83			
				3.59	25.00	89.75
575	2.15	5.50	3.35			
				2.84	25.00	71.00
600	3.30	5.63	2.33			
				1.81	25.00	45.25
625	4.46	5.75	1.29			
				0.65	2.00	1.29
627	5.64	5.64	0.00			

AREA OF SECTION: 3,520.19 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c*d
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Section N°
-1

distance	a	b	c	c'	d	e
93	-18.41	4.50	22.91			
125	-17.38	4.50	21.88	22.40	32.00	716.64
150	-16.53	4.50	21.03	21.46	25.00	536.38
175	-15.35	4.50	19.85	20.44	25.00	511.00
200	-14.18	4.50	18.68	19.27	25.00	481.63
225	-13.01	4.50	17.51	18.10	25.00	452.38
250	-11.84	4.50	16.34	16.93	25.00	423.13
275	-10.67	4.50	15.17	15.76	25.00	393.88
300	-9.50	4.50	14.00	14.59	25.00	364.63
325	-4.23	4.50	8.73	11.37	25.00	284.13
350	-2.13	4.50	6.63	7.68	25.00	192.00
375	-0.77	4.50	5.27	5.95	25.00	148.75
400	-0.40	4.50	4.90	5.09	25.00	127.13
425	0.19	4.63	4.44	4.67	25.00	116.75
450	2.14	4.75	2.61	3.53	25.00	88.13
475	2.42	4.88	2.46	2.54	25.00	63.38
500	1.79	5.00	3.21	2.84	25.00	70.88
525	1.31	5.13	3.82	3.52	25.00	87.88
550	1.82	5.25	3.43	3.63	25.00	90.63
575	2.45	5.38	2.93	3.18	25.00	79.50
600	4.11	5.50	1.39	2.16	25.00	54.00
613	5.57	5.57	0.00	0.70	13.00	9.04

AREA OF SECTION: 5,291.80 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c'd
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Section N°
0

distance	a	b	c	c'	d	e
50	-18.66	4.50	23.16			
75	-18.33	4.50	22.83	23.00	25.00	574.88
100	-18.41	4.50	22.91	22.87	25.00	571.75
125	-18.29	4.50	22.79	22.85	25.00	571.25
150	-18.00	4.50	22.50	22.65	25.00	566.13
175	-17.00	4.50	21.50	22.00	25.00	550.00
200	-16.00	4.50	20.50	21.00	25.00	525.00
225	-15.00	4.50	19.50	20.00	25.00	500.00
250	-14.00	4.50	18.50	19.00	25.00	475.00
275	-13.00	4.50	17.50	18.00	25.00	450.00
300	-12.00	4.50	16.50	17.00	25.00	425.00
325	-7.61	4.50	12.11	14.31	25.00	357.63
350	-3.23	4.50	7.73	9.92	25.00	248.00
375	-0.14	4.50	4.64	6.19	25.00	154.63
400	0.18	4.50	4.32	4.48	25.00	112.00
425	0.23	4.63	4.40	4.36	25.00	109.00
450	0.73	4.75	4.02	4.21	25.00	105.25
475	0.86	4.88	4.02	4.02	25.00	100.50
500	1.14	5.00	3.86	3.94	25.00	98.50
525	1.55	5.13	3.58	3.72	25.00	93.00
550	1.96	5.25	3.29	3.44	25.00	85.88
575	2.55	5.38	2.83	3.06	25.00	76.50
600	4.88	5.50	0.62	1.73	25.00	43.13
616	5.59	5.59	0.00	0.31	16.00	4.96

AREA OF SECTION: 6,797.96 m²

Bottom elevation including soft soil = a	Final Elevation; b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e=c*d
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Section N°
1

distance	a	b	c	c'	d	e
50	-18.75	4.50	23.25			
75	-18.66	4.50	23.16	23.21	25.00	580.13
100	-18.58	4.50	23.08	23.12	25.00	578.00
125	-18.49	4.50	22.99	23.04	25.00	575.88
150	-18.40	4.50	22.90	22.95	25.00	573.63
175	-18.00	4.50	22.50	22.70	25.00	567.50
200	-16.46	4.50	20.96	21.73	25.00	543.25
225	-14.18	4.50	18.68	19.82	25.00	495.50
250	-11.89	4.50	16.39	17.54	25.00	438.38
275	-9.60	4.50	14.10	15.25	25.00	381.13
300	-7.31	4.50	11.81	12.96	25.00	323.88
325	-4.93	4.50	9.43	10.62	25.00	265.50
350	-2.49	4.50	6.99	8.21	25.00	205.25
375	-0.05	4.50	4.55	5.77	25.00	144.25
400	0.31	4.50	4.19	4.37	25.00	109.25
425	0.83	4.63	3.80	4.00	25.00	99.88
450	0.57	4.75	4.18	3.99	25.00	99.75
475	1.01	4.88	3.87	4.03	25.00	100.63
500	1.44	5.00	3.56	3.72	25.00	92.88
525	1.88	5.13	3.25	3.41	25.00	85.13
550	2.23	5.25	3.02	3.14	25.00	78.38
575	2.40	5.38	2.98	3.00	25.00	75.00
601	5.51	5.51	0.00	1.49	26.00	38.74

AREA OF SECTION: 6,451.87 m²

Bottom elevation including soft soil = a	Final Elevation; b	Difference of elevation; c= b-a	Average of elevations	Width; d	area: e= c*d
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Section N°
2

distance	a	b	c	c'	d	e
50	-18.80	4.50	23.30			
				23.32	25.00	582.88
75	-18.83	4.50	23.33			
				23.31	25.00	582.75
100	-18.79	4.50	23.29			
				23.27	25.00	581.63
125	-18.74	4.50	23.24			
				23.22	25.00	580.50
150	-18.70	4.50	23.20			
				23.18	25.00	579.50
175	-18.66	4.50	23.16			
				23.14	25.00	578.38
200	-18.61	4.50	23.11			
				21.89	25.00	547.25
225	-16.17	4.50	20.67			
				18.66	25.00	466.38
250	-12.14	4.50	16.64			
				14.61	25.00	365.25
275	-8.08	4.50	12.58			
				10.56	25.00	263.88
300	-4.03	4.50	8.53			
				6.84	25.00	170.88
325	-0.64	4.50	5.14			
				4.77	25.00	119.13
350	0.11	4.50	4.39			
				4.32	25.00	108.00
375	0.25	4.50	4.25			
				4.22	25.00	105.38
400	0.32	4.50	4.18			
				4.21	25.00	105.25
425	0.39	4.63	4.24			
				4.09	25.00	102.25
450	0.81	4.75	3.94			
				3.70	25.00	92.38
475	1.43	4.88	3.45			
				3.27	25.00	81.75
500	1.91	5.00	3.09			
				2.95	25.00	73.75
525	2.32	5.13	2.81			
				2.77	25.00	69.13
550	2.53	5.25	2.72			
				2.72	25.00	67.88
575	2.67	5.38	2.71			
				1.36	14.00	18.97
589	5.45	5.45	0.00			

AREA OF SECTION: 6,243.10 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c*d
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Section N°
3

distance	a	b	c	c'	d	e
50	-18.94	4.50	23.44			
				23.38	25.00	584.38
75	-18.81	4.50	23.31			
				23.30	25.00	582.50
100	-18.79	4.50	23.29			
				23.27	25.00	581.63
125	-18.74	4.50	23.24			
				23.22	25.00	580.50
150	-18.70	4.50	23.20			
				23.18	25.00	579.50
175	-18.66	4.50	23.16			
				23.14	25.00	578.38
200	-18.61	4.50	23.11			
				21.84	25.00	545.88
225	-16.06	4.50	20.56			
				18.45	25.00	461.13
250	-11.83	4.50	16.33			
				13.95	25.00	348.63
275	-7.06	4.50	11.56			
				9.72	25.00	243.00
300	-3.38	4.50	7.88			
				6.17	25.00	154.13
325	0.05	4.50	4.45			
				4.42	25.00	110.38
350	0.12	4.50	4.38			
				4.38	25.00	109.50
375	0.12	4.50	4.38			
				4.30	25.00	107.38
400	0.29	4.50	4.21			
				4.08	25.00	102.00
425	0.68	4.63	3.95			
				3.85	25.00	96.25
450	1.00	4.75	3.75			
				3.19	25.00	79.75
475	2.25	4.88	2.63			
				2.42	25.00	60.38
500	2.80	5.00	2.20			
				2.11	25.00	52.63
525	3.12	5.13	2.01			
				1.01	24.00	24.12
549	5.25	5.25	0.00			

AREA OF SECTION: 5,982.00 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c*d
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Section N°
4

distance	a	b	c	c'	d	e
50	-18.87	4.50	23.37			
75	-18.83	4.50	23.33	23.35	25.00	583.75
100	-18.79	4.50	23.29	23.31	25.00	582.75
125	-18.74	4.50	23.24	23.27	25.00	581.63
150	-18.70	4.50	23.20	23.22	25.00	580.50
175	-18.66	4.50	23.16	23.18	25.00	579.50
200	-18.61	4.50	23.11	23.14	25.00	578.38
225	-16.06	4.50	20.56	21.84	25.00	545.88
250	-11.83	4.50	16.33	18.45	25.00	461.13
275	-7.60	4.50	12.10	14.22	25.00	355.38
300	-3.38	4.50	7.88	9.99	25.00	249.75
325	-0.33	4.50	4.83	6.36	25.00	158.88
350	0.06	4.50	4.44	4.64	25.00	115.88
375	0.48	4.50	4.02	4.23	25.00	105.75
400	0.48	4.50	4.02	4.02	25.00	100.50
425	0.57	4.63	4.06	4.04	25.00	101.00
450	1.11	4.75	3.64	3.85	25.00	96.25
475	2.02	4.88	2.86	3.25	25.00	81.25
490	5.00	5.00	0.00	1.43	15.00	21.45

AREA OF SECTION: 5,879.58 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevallons	Width: d	area: e= c*d
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Section N°
5

distance	a	b	c	c'	d	e
50	-16.07	4.50	20.57			
75	-16.21	4.50	20.71	20.64	25.00	516.00
100	-16.35	4.50	20.85	20.78	25.00	519.50
125	-16.49	4.50	20.99	20.92	25.00	523.00
150	-16.63	4.50	21.13	21.06	25.00	526.50
175	-16.77	4.50	21.27	21.20	25.00	530.00
200	-14.08	4.50	18.58	19.93	25.00	498.13
225	-10.68	4.50	15.18	16.88	25.00	422.00
250	-7.29	4.50	11.79	13.49	25.00	337.13
275	-3.89	4.50	8.39	10.09	25.00	252.25
300	-0.50	4.50	5.00	6.70	25.00	167.38
325	-0.06	4.50	4.56	4.78	25.00	119.50
350	0.40	4.50	4.10	4.33	25.00	108.25
375	0.40	4.50	4.10	4.10	25.00	102.50
400	0.86	4.50	3.64	3.87	25.00	96.75
425	1.90	4.63	2.73	3.19	25.00	79.63
445	4.73	4.73	0.00	1.37	20.00	27.30

AREA OF SECTION: 4,825.80 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c*d
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Section N°
6

distance	a	b	c	c'	d	e
50	-14.07	4.50	18.57			
				18.37	25.00	459.25
75	-13.67	4.50	18.17			
				18.39	25.00	459.75
100	-14.11	4.50	18.61			
				18.83	25.00	470.75
125	-14.55	4.50	19.05			
				18.98	25.00	474.38
150	-14.40	4.50	18.90			
				17.66	25.00	441.50
175	-11.92	4.50	16.42			
				15.18	25.00	379.38
200	-9.43	4.50	13.93			
				12.69	25.00	317.25
225	-6.95	4.50	11.45			
				10.21	25.00	255.25
250	-4.47	4.50	8.97			
				7.73	25.00	193.25
275	-1.99	4.50	6.49			
				5.42	25.00	135.38
300	0.16	4.50	4.34			
				4.18	25.00	104.50
325	0.48	4.50	4.02			
				3.70	25.00	92.50
350	1.12	4.50	3.38			
				2.94	25.00	73.38
375	2.01	4.50	2.49			
				1.41	25.00	35.25
400	4.17	4.50	0.33			
				0.38	25.00	9.50
425	4.20	4.63	0.43			
				0.22	8.00	1.72
433	4.67	4.67	0.00			

AREA OF SECTION: 3,902.97 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c = b-a	Average of elevations	Width: d	area: e = c*d
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Section N°
7

distance	a	b	c	c'	d	e
50	-13.91	4.50	18.41			
				18.33	25.00	458.13
75	-13.74	4.50	18.24			
				18.45	25.00	461.13
100	-14.15	4.50	18.65			
				18.86	25.00	471.50
125	-14.57	4.50	19.07			
				18.99	25.00	474.63
150	-14.40	4.50	18.90			
				17.66	25.00	441.50
175	-11.92	4.50	16.42			
				15.18	25.00	379.38
200	-9.43	4.50	13.93			
				12.69	25.00	317.25
225	-6.95	4.50	11.45			
				10.21	25.00	255.25
250	-4.47	4.50	8.97			
				7.73	25.00	193.25
275	-1.99	4.50	6.49			
				5.50	25.00	137.50
300	-0.01	4.50	4.51			
				4.37	25.00	109.25
325	0.27	4.50	4.23			
				3.38	25.00	84.50
350	1.97	4.50	2.53			
				1.37	25.00	34.25
375	4.29	4.50	0.21			
				0.11	16.00	1.68
391	4.50	4.50	0.00			

AREA OF SECTION: 3,819.18 m²

Bottom elevation including soft soil = a	Final Elevation; b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c*d
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Section N°
8

distance	a	b	c	c'	d	e
50	-13.72	4.50	18.22			
				18.27	25.00	456.63
75	-13.81	4.50	18.31			
				18.51	25.00	462.63
100	-14.20	4.50	18.70			
				18.89	25.00	472.25
125	-14.58	4.50	19.08			
				18.99	25.00	474.75
150	-14.40	4.50	18.90			
				17.66	25.00	441.50
175	-11.92	4.50	16.42			
				15.18	25.00	379.38
200	-9.43	4.50	13.93			
				12.69	25.00	317.25
225	-6.95	4.50	11.45			
				10.21	25.00	255.25
250	-4.47	4.50	8.97			
				7.74	25.00	193.38
275	-2.00	4.50	6.50			
				4.06	25.00	101.38
300	2.89	4.50	1.61			
				1.56	25.00	38.88
325	3.00	4.50	1.50			
				0.75	26.00	19.50
351	4.50	4.50	0.00			

AREA OF SECTION: 3,612.75 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c*d
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Section N°
9

distance	a	b	c	c'	d	e
50	-13.38	4.50	17.88			
75	-13.78	4.50	18.28	18.08	25.00	452.00
100	-14.18	4.50	18.68	18.48	25.00	462.00
125	-14.58	4.50	19.08	18.88	25.00	472.00
150	-14.42	4.50	18.92	19.00	25.00	475.00
175	-12.02	4.50	16.52	17.72	25.00	443.00
200	-9.62	4.50	14.12	15.32	25.00	383.00
225	-7.23	4.50	11.73	12.93	25.00	323.13
250	-4.83	4.50	9.33	10.53	25.00	263.25
275	-2.43	4.50	6.93	8.13	25.00	203.25
300	-0.78	4.50	5.28	6.11	25.00	152.63
325	3.58	4.50	0.92	3.10	25.00	77.50
350	4.00	4.50	0.50	0.71	25.00	17.75
356	4.50	4.50	0.00	0.25	6.00	1.50

AREA OF SECTION: 3,726.00 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c'd
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Section N°
10

distance	a	b	c	c'	d	e
50	-15.47	4.50	19.97			
				19.91	25.00	497.63
75	-15.34	4.50	19.84			
				19.78	25.00	494.38
100	-15.21	4.50	19.71			
				19.64	25.00	491.00
125	-15.07	4.50	19.57			
				19.08	25.00	477.00
150	-14.09	4.50	18.59			
				17.46	25.00	436.38
175	-11.82	4.50	16.32			
				15.19	25.00	379.75
200	-9.56	4.50	14.06			
				12.93	25.00	323.13
225	-7.29	4.50	11.79			
				10.66	25.00	266.50
250	-5.03	4.50	9.53			
				8.40	25.00	209.88
275	-2.76	4.50	7.26			
				5.91	25.00	147.63
300	-0.05	4.50	4.55			
				3.70	25.00	92.38
325	1.66	4.50	2.84			
				2.17	25.00	54.25
350	3.00	4.50	1.50			
				0.75	21.00	15.75
371	4.50	4.50	0.00			

AREA OF SECTION: 3,885.63 m²

Bottom elevation Including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c*d
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Section N°
11

distance	a	b	c	c'	d	e
50	-13.57	4.50	18.07			
				18.29	25.00	457.13
75	-14.00	4.50	18.50			
				18.69	25.00	467.25
100	-14.38	4.50	18.88			
				19.07	25.00	476.75
125	-14.76	4.50	19.26			
				18.93	25.00	473.13
150	-14.09	4.50	18.59			
				17.46	25.00	436.38
175	-11.82	4.50	16.32			
				15.19	25.00	379.75
200	-9.56	4.50	14.06			
				12.93	25.00	323.13
225	-7.29	4.50	11.79			
				10.66	25.00	266.50
250	-5.03	4.50	9.53			
				8.40	25.00	209.88
275	-2.76	4.50	7.26			
				6.13	25.00	153.25
300	-0.50	4.50	5.00			
				4.75	25.00	118.63
325	0.01	4.50	4.49			
				4.22	25.00	105.50
350	0.55	4.50	3.95			
				1.98	25.00	49.38
375	4.50	4.50	0.00			

AREA OF SECTION: 3,916.63 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c'd
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Section N°
12

distance	a	b	c	c'	d	e
50	-15.64	4.50	20.14			
				20.05	25.00	501.25
75	-15.46	4.50	19.96			
				19.87	25.00	496.75
100	-15.28	4.50	19.78			
				19.69	25.00	492.25
125	-15.10	4.50	19.60			
				19.12	25.00	478.00
150	-14.14	4.50	18.64			
				17.36	25.00	434.00
175	-11.58	4.50	16.08			
				15.23	25.00	380.75
200	-9.88	4.50	14.38			
				13.32	25.00	332.88
225	-7.75	4.50	12.25			
				11.18	25.00	279.50
250	-5.61	4.50	10.11			
				9.05	25.00	226.13
275	-3.48	4.50	7.98			
				6.92	25.00	172.88
300	-1.35	4.50	5.85			
				5.23	25.00	130.75
325	-0.11	4.50	4.61			
				4.04	25.00	101.00
350	1.03	4.50	3.47			
				2.35	25.00	58.75
375	3.27	4.50	1.23			
				0.62	3.00	1.85
378	4.50	4.50	0.00			

AREA OF SECTION: 4,086.72 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c*d
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Section N°
13

distance	a	b	c	c'	d	e
50	-17.58	4.50	22.08			
75	-16.86	4.50	21.36	21.72	25.00	543.00
100	-16.14	4.50	20.64	21.00	25.00	525.00
125	-15.43	4.50	19.93	20.29	25.00	507.13
150	-14.72	4.50	19.22	19.58	25.00	489.25
175	-14.00	4.50	18.50	18.87	25.00	471.38
200	-13.29	4.50	17.79	18.16	25.00	453.50
225	-12.58	4.50	17.08	17.45	25.00	435.63
250	-11.87	4.50	16.37	16.74	25.00	417.75
275	-11.16	4.50	15.66	16.03	25.00	400.00
300	-10.45	4.50	14.95	15.32	25.00	382.25
325	-9.74	4.50	14.24	14.61	25.00	364.50
350	-9.03	4.50	13.53	13.90	25.00	346.75
373	-8.32	4.50	12.82	13.19	23.00	329.00

AREA OF SECTION: 4,258.02 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e=c*d
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Section N°
14

distance	a	b	c	c'	d	e
50	-17.65	4.50	22.15			
75	-16.91	4.50	21.41	21.78	25.00	544.50
100	-16.17	4.50	20.67	21.04	25.00	526.00
125	-15.44	4.50	19.94	20.31	25.00	507.63
150	-14.14	4.50	18.64	19.29	25.00	482.25
175	-12.00	4.50	16.50	17.57	25.00	439.25
200	-9.85	4.50	14.35	15.43	25.00	385.63
225	-7.71	4.50	12.21	13.28	25.00	332.00
250	-5.57	4.50	10.07	11.14	25.00	278.50
275	-3.70	4.50	8.20	9.14	25.00	228.38
300	-3.15	4.50	7.65	7.93	25.00	198.13
325	-2.21	4.50	6.71	7.18	25.00	179.50
350	-1.01	4.50	5.51	6.11	25.00	152.75
363	4.50	4.50	0.00	2.76	13.00	35.82

AREA OF SECTION: 4,290.32 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c*d
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Section N°
15

distance	a	b	c	c'	d	e
50	-17.15	4.50	21.65			
				20.90	25.00	522.50
75	-15.65	4.50	20.15			
				19.70	25.00	492.50
100	-14.75	4.50	19.25			
				21.30	25.00	532.38
125	-18.84	4.50	23.34			
				20.34	25.00	508.50
150	-12.84	4.50	17.34			
				16.20	25.00	405.00
175	-10.56	4.50	15.06			
				14.08	25.00	352.00
200	-8.60	4.50	13.10			
				12.13	25.00	303.13
225	-6.65	4.50	11.15			
				10.17	25.00	254.25
250	-4.69	4.50	9.19			
				8.61	25.00	215.25
275	-3.53	4.50	8.03			
				7.81	25.00	195.25
300	-3.09	4.50	7.59			
				7.12	25.00	177.88
325	-2.14	4.50	6.64			
				3.32	33.00	109.56
358	4.50	4.50	0.00			

AREA OF SECTION: 4,068.19 m²

Bottom elevation Including soft soil = a	Final Elevation: b	Difference of elevation: c = b - a	Average of elevations	Width: d	area: e = c' * d
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Section N°
16

distance	a	b	c	c'	d	e
50	-15.57	4.50	20.07			
				19.51	25.00	487.63
75	-14.44	4.50	18.94			
				18.38	25.00	459.38
100	-13.31	4.50	17.81			
				17.24	25.00	431.00
125	-12.17	4.50	16.67			
				16.00	25.00	399.88
150	-10.82	4.50	15.32			
				14.48	25.00	361.88
175	-9.13	4.50	13.63			
				12.79	25.00	319.63
200	-7.44	4.50	11.94			
				11.10	25.00	277.38
225	-5.75	4.50	10.25			
				9.40	25.00	235.00
250	-4.05	4.50	8.55			
				8.21	25.00	205.13
275	-3.36	4.50	7.86			
				7.61	25.00	190.13
300	-2.85	4.50	7.35			
				6.91	25.00	172.63
325	-1.96	4.50	6.46			
				5.91	25.00	147.63
350	-0.85	4.50	5.35			
				2.68	16.00	42.80
366	4.5	4.50	0			

AREA OF SECTION: 3,730.05 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c*d
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Section N°
17

distance	a	b	c	c'	d	e
50	-15.50	4.50	20.00			
				18.76	25.00	468.88
75	-13.01	4.50	17.51			
				16.89	25.00	422.13
100	-11.76	4.50	16.26			
				16.09	25.00	402.25
125	-11.42	4.50	15.92			
				14.82	25.00	370.38
150	-9.21	4.50	13.71			
				12.99	25.00	324.63
175	-7.76	4.50	12.26			
				11.53	25.00	288.25
200	-6.30	4.50	10.80			
				10.08	25.00	251.88
225	-4.85	4.50	9.35			
				8.65	25.00	216.25
250	-3.45	4.50	7.95			
				7.88	25.00	196.88
275	-3.30	4.50	7.80			
				7.53	25.00	188.13
300	-2.75	4.50	7.25			
				6.78	25.00	169.38
325	-1.80	4.50	6.30			
				5.83	25.00	145.63
350	-0.85	4.50	5.35			
				2.68	13.00	34.78
363	4.50	4.50	0.00			

AREA OF SECTION: 3,479.40 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c*d
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Section N°
18

distance	a	b	c	c'	d	e
50	-15.50	4.50	20.00			
				18.25	25.00	456.25
75	-12.00	4.50	16.50			
				16.00	25.00	400.00
100	-11.00	4.50	15.50			
				15.38	25.00	384.38
125	-10.75	4.50	15.25			
				13.63	25.00	340.75
150	-7.51	4.50	12.01			
				11.41	25.00	285.25
175	-6.31	4.50	10.81			
				10.21	25.00	255.25
200	-5.11	4.50	9.61			
				9.06	25.00	226.38
225	-4.00	4.50	8.50			
				8.22	25.00	205.50
250	-3.44	4.50	7.94			
				7.83	25.00	195.63
275	-3.21	4.50	7.71			
				7.41	25.00	185.25
300	-2.61	4.50	7.11			
				6.73	25.00	168.25
325	-1.85	4.50	6.35			
				5.86	25.00	146.50
350	-0.87	4.50	5.37			
				2.69	25.00	67.13
375	4.50	4.50	0.00			

AREA OF SECTION: 3,316.50 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c*d
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Section N°
19

distance	a	b	c	c'	d	e
50	-13.47	4.50	17.97			
				17.07	25.00	426.75
75	-11.67	4.50	16.17			
				15.73	25.00	393.25
100	-10.79	4.50	15.29			
				14.99	25.00	374.63
125	-10.18	4.50	14.68			
				13.35	25.00	333.63
150	-7.51	4.50	12.01			
				11.41	25.00	285.25
175	-6.31	4.50	10.81			
				10.21	25.00	255.25
200	-5.11	4.50	9.61			
				9.01	25.00	225.13
225	-3.90	4.50	8.40			
				8.17	25.00	204.25
250	-3.44	4.50	7.94			
				7.74	25.00	193.50
275	-3.04	4.50	7.54			
				7.28	25.00	182.00
300	-2.52	4.50	7.02			
				6.76	25.00	169.00
325	-2.00	4.50	6.50			
				5.87	25.00	146.75
350	-0.74	4.50	5.24			
				2.62	20.00	52.40
370	4.50	4.50	0.00			

AREA OF SECTION: 3,241.78 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation; c= b-a	Average of elevations	Width: d	area: e= c*d
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Section N°
20

distance	a	b	c	c'	d	e
50	-13.30	4.50	17.80			
				16.96	25.00	423.88
75	-11.61	4.50	16.11			
				15.54	25.00	388.38
100	-10.46	4.50	14.96			
				14.52	25.00	363.00
125	-9.58	4.50	14.08			
				13.05	25.00	326.13
150	-7.51	4.50	12.01			
				11.41	25.00	285.25
175	-6.31	4.50	10.81			
				10.21	25.00	255.25
200	-5.11	4.50	9.61			
				9.01	25.00	225.13
225	-3.90	4.50	8.40			
				8.15	25.00	203.63
250	-3.39	4.50	7.89			
				7.68	25.00	192.00
275	-2.97	4.50	7.47			
				7.28	25.00	182.00
300	-2.59	4.50	7.09			
				6.78	25.00	169.38
325	-1.96	4.50	6.46			
				5.76	25.00	143.88
350	-0.55	4.50	5.05			
				2.53	18.00	45.45
368	4.50	4.50	0.00			

AREA OF SECTION: 3,203.33 m²

COASTAL RECLAMATION AREA WITH AVERAGE HEIGHTS INCLUDING SOFT SOIL RECLAMATION IN JULY 2002

Bottom elevation Including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c*d
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Section N°
21

distance	a	b	c	c'	d	e
50	-14.47	4.50	18.97			
				20.78	25.00	519.50
75	-18.09	4.50	22.59			
				19.40	25.00	485.00
100	-11.71	4.50	16.21			
				15.52	25.00	387.88
125	-10.32	4.50	14.82			
				14.10	25.00	352.50
150	-8.88	4.50	13.38			
				12.87	25.00	321.63
175	-7.85	4.50	12.35			
				11.34	25.00	283.38
200	-5.82	4.50	10.32			
				9.56	25.00	238.88
225	-4.29	4.50	8.79			
				8.02	25.00	200.50
250	-2.75	4.50	7.25			
				6.49	25.00	162.13
275	-1.22	4.50	5.72			
				5.38	25.00	134.38
300	-0.53	4.50	5.03			
				4.14	25.00	103.38
325	1.26	4.50	3.24			
				1.83	25.00	45.75
350	4.08	4.50	0.42			
				0.21	3.00	0.63
353	4.50	4.50	0.00			

AREA OF SECTION: 3,235.51 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c*d
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Section N°
22

distance	a	b	c	c'	d	e
50	-15.54	4.50	20.04			
				19.47	25.00	486.75
75	-14.40	4.50	18.90			
				18.34	25.00	458.38
100	-13.27	4.50	17.77			
				17.20	25.00	430.00
125	-12.13	4.50	16.63			
				16.07	25.00	401.63
150	-11.00	4.50	15.50			
				14.55	25.00	363.75
175	-9.10	4.50	13.60			
				12.65	25.00	316.25
200	-7.20	4.50	11.70			
				10.76	25.00	268.88
225	-5.31	4.50	9.81			
				8.86	25.00	221.50
250	-3.41	4.50	7.91			
				6.96	25.00	174.00
275	-1.51	4.50	6.01			
				5.44	25.00	136.00
300	-0.37	4.50	4.87			
				2.44	23.00	56.01
323	4.50	4.50	0.00			

AREA OF SECTION: 3,313.13 m²

Bottom elevation including soft soil = a	Final Elevation: b	Difference of elevation: c= b-a	Average of elevations	Width: d	area: e= c*d
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Section N°
22'

distance	a	b	c	c'	d	e
50	-18.10	4.50	22.60			
				22.60	25.00	565.00
75	-18.10	4.50	22.60			
				22.11	25.00	552.75
100	-17.12	4.50	21.62			
				21.14	25.00	528.38
125	-16.15	4.50	20.65			
				20.16	25.00	504.00
150	-15.17	4.50	19.67			
				19.18	25.00	479.50
175	-14.19	4.50	18.69			
				17.55	25.00	438.75
200	-11.91	4.50	16.41			
				15.11	25.00	377.75
225	-9.81	4.50	13.81			
				12.51	25.00	312.75
250	-6.71	4.50	11.21			
				9.91	25.00	247.75
275	-4.11	4.50	8.61			
				7.31	25.00	182.75
300	-1.51	4.50	6.01			
				3.01	23.00	69.12
323	4.50	4.50	0.00			

AREA OF SECTION: 4,258.49 m²

VOLUME BEHIND CAISSONS UP TO 50 mt.(up to natural ground)

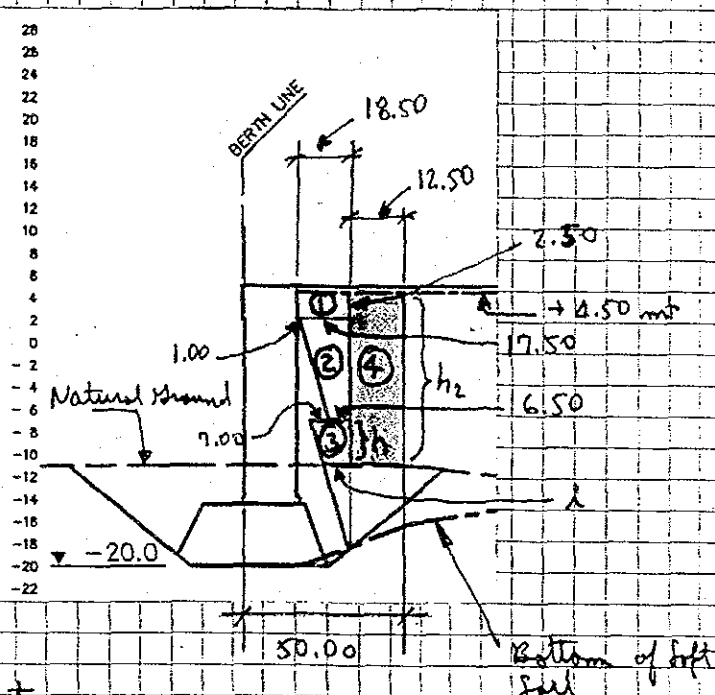
June 6/2002

New Elevation: 4.5 meters

SECTION N°	AREA	AVERAGE AREA OF 2 SECTIONS	DISTANCE BETWEEN SECTIONS	VOLUME
1	370.75			
		370.75	25.00	9,269
2	370.75			
		376.59	25.00	9,415
3	382.44			
		385.22	25.00	9,630
4	388.00			
		390.25	25.00	9,756
5	392.50			
		392.50	25.00	9,813
6	392.50			
		392.50	25.00	9,813
7	392.50			
		392.50	25.00	9,813
8	392.50			
		392.50	25.00	9,813
9	392.50			
		392.50	25.00	9,813
10	392.50			
		392.50	25.00	9,813
11	392.50			
		402.75	25.00	10,069
12	413.00			
		402.75	25.00	10,069
13	392.50			
		392.50	25.00	9,813
14	392.50			
		392.50	25.00	9,813
15	392.50			
		392.50	25.00	9,813
16	392.50			
		392.50	25.00	9,813
17	392.50			
		392.50	25.00	9,813
18	392.50			
		390.25	25.00	9,756
19	388.00			
		385.22	25.00	9,630
20	382.44			
		376.59	25.00	9,415
21	370.75			
		358.88	25.00	8,972
22	347.00			
		347.00	10.00	3,470
22'	347.00			

VOLUME BEHIND CAISSONS UP TO 50 mt.: 207,389 m³
 (up to natural ground)

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Reclamation	Calc. Index No.	
Subject	Volume behind caisson up to 50 mt (up to natural ground)	Page No.	Rev.



Sample Calculations:

Area 1: $2.50 \times 18.50 = 46.25 \text{ m}^2$

Area 2: $\frac{17.50 + 6.50}{2} \times 9 = 108 \text{ m}^2$

Area 3: $\frac{13.50 + 11.50}{2} \times 4 = 50 \text{ m}^2$

Area 4: $12.50 \times 15.5 = 194 \text{ m}^2$

Total : 398 m^2

Prepared by		Checked by	
JAM	6 / VI / 2002		1 / 200

Section N° 1			
area 1:	46.25		
area 2:	108.00		
area 3:	35.25	height = h = 3.00	width = i = 10.00
area 4:	181.25	height = h ₂ = 14.50	
370.75 m ²			

o.k.

Section N° 2			
area 1:	46.25		
area 2:	108.00		
area 3:	35.25	height = h = 3.00	width = i = 10.00
area 4:	181.25	height = h ₂ = 14.50	
370.75 m ²			

o.k.

Section N° 3			
area 1:	46.25		
area 2:	108.00		
area 3:	40.69	height = h = 3.50	width = i = 9.75
area 4:	187.50	height = h ₂ = 15.00	
382.44 m ²			

o.k.

Section N° 4			
area 1:	46.25		
area 2:	108.00		
area 3:	43.13	height = h = 3.75	width = i = 9.50
area 4:	190.63	height = h ₂ = 15.25	
388.00 m ²			

o.k.

Section N° 5			
area 1:	46.25		
area 2:	108.00		
area 3:	44.50	height = h = 4.00	width = i = 8.75
area 4:	193.75	height = h ₂ = 15.50	
392.50 m ²			

o.k.

Section N° 6			
area 1:	46.25		
area 2:	108.00		
area 3:	44.50	height = h = 4.00	width = i = 8.75
area 4:	193.75	height = h ₂ = 15.50	
		<hr/>	
392.50 m ²			

o.k.

Section N° 7			
area 1:	46.25		
area 2:	108.00		
area 3:	44.50	height = h = 4.00	width = i = 8.75
area 4:	193.75	height = h ₂ = 15.50	
		<hr/>	
392.50 m ²			

o.k.

Section N° 8			
area 1:	46.25		
area 2:	108.00		
area 3:	44.50	height = h = 4.00	width = i = 8.75
area 4:	193.75	height = h ₂ = 15.50	
		<hr/>	
392.50 m ²			

o.k.

Section N° 9			
area 1:	46.25		
area 2:	108.00		
area 3:	44.50	height = h = 4.00	width = i = 8.75
area 4:	193.75	height = h ₂ = 15.50	
		<hr/>	
392.50 m ²			

o.k.

Section N° 10			
area 1:	46.25		
area 2:	108.00		
area 3:	44.50	height = h = 4.00	width = i = 8.75
area 4:	193.75	height = h ₂ = 15.50	
		<hr/>	
392.50 m ²			

o.k.

Section N° 11			
area 1:	46.25		
area 2:	108.00		
area 3:	44.50	height = h = 4.00	width = i = 8.75
area 4:	193.75	height = h ₂ = 15.50	
		392.50 m ²	

o.k.

Section N° 12			
area 1:	46.25		
area 2:	108.00		
area 3:	52.50	height = h = 5.00	width = i = 7.50
area 4:	206.25	height = h ₂ = 16.50	
		413.00 m ²	

o.k.

Section N° 13			
area 1:	46.25		
area 2:	108.00		
area 3:	44.50	height = h = 4.00	width = i = 8.75
area 4:	193.75	height = h ₂ = 15.50	
		392.50 m ²	

o.k.

Section N° 14			
area 1:	46.25		
area 2:	108.00		
area 3:	44.50	height = h = 4.00	width = i = 8.75
area 4:	193.75	height = h ₂ = 15.50	
		392.50 m ²	

o.k.

Section N° 15			
area 1:	46.25		
area 2:	108.00		
area 3:	44.50	height = h = 4.00	width = i = 8.75
area 4:	193.75	height = h ₂ = 15.50	
		392.50 m ²	

o.k.

Section N° 16			
area 1:	46.25		
area 2:	108.00		
area 3:	44.50	height = h = 4.00	width = i = 8.75
area 4:	193.75	height = h ₂ = 15.50	
		<hr/>	
		392.50 m ²	

Section N° 17			
area 1:	46.25		
area 2:	108.00		
area 3:	44.50	height = h = 4.00	width = i = 8.75
area 4:	193.75	height = h ₂ = 15.50	
		<hr/>	
		392.50 m ²	

Section N° 18			
area 1:	46.25		
area 2:	108.00		
area 3:	44.50	height = h = 4.00	width = i = 8.75
area 4:	193.75	height = h ₂ = 15.50	
		<hr/>	
		392.50 m ²	

Section N° 19			
area 1:	46.25		
area 2:	108.00		
area 3:	43.13	height = h = 3.75	width = i = 9.50
area 4:	190.63	height = h ₂ = 15.25	
		<hr/>	
		388.00 m ²	

Section N° 20			
area 1:	46.25		
area 2:	108.00		
area 3:	40.69	height = h = 3.50	width = i = 9.75
area 4:	187.50	height = h ₂ = 15.00	
		<hr/>	
		382.44 m ²	

Section N° 21			
area 1:	46.25		
area 2:	108.00		
area 3:	35.25	height = h = 3.00	width = i = 10.00
area 4:	181.25	height = h ₂ = 14.50	
<u>370.75 m²</u>			

o.k.

Section N° 22			
area 1:	46.25		
area 2:	108.00		
area 3:	24.00	height = h = 2.00	width = i = 10.50
area 4:	168.75	height = h ₂ = 13.50	
<u>347.00 m²</u>			

o.k.

Section N° 22'			
area 1:	46.25		
area 2:	108.00		
area 3:	24.00	height = h = 2.00	width = i = 10.50
area 4:	168.75	height = h ₂ = 13.50	
<u>347.00 m²</u>			

o.k.

RECLAMATION BELOW NATURAL GROUND: FROM 0.00 UP TO 50.00 METERS
 (BEGINNING FROM FACE OF CAISSONS TOWARDS IN-LAND)
 28-May-02

SECTION N°	AREA	AVERAGE AREA OF 2 SECTIONS	DISTANCE BETWEEN SECTIONS	VOLUME
-4				
-3				
-2				
-1				
0	150.63	150.63	25.00	3,766
1	150.63	150.63	25.00	3,766
2	150.63	150.63	25.00	3,766
3	150.63	148.24	25.00	3,706
4	145.85	122.30	25.00	3,058
5	98.75	86.88	25.00	2,172
6	75.00	68.91	25.00	1,723
7	62.81	62.03	25.00	1,551
8	61.25	54.38	25.00	1,359
9	47.50	65.94	25.00	1,649
10	84.38	72.82	25.00	1,820
11	61.25	71.26	25.00	1,781
12	81.26	101.01	25.00	2,525
13	120.75	122.00	25.00	3,050
14	123.25	117.25	25.00	2,931
15	111.25	105.63	25.00	2,641
16	100.00	100.00	25.00	2,500
17	100.00	100.00	25.00	2,500
18	100.00	83.44	25.00	2,086
19	66.88	69.76	25.00	1,744
20	72.63	100.44	25.00	2,511
21	128.25	136.00	25.00	3,400
22	143.75	154.94	10.00	1,549
22'	166.13			

VOLUME OF RECLAMATION BELOW NATURAL GROUND (FROM 0.00 UP TO 50.00 BEHIND CAISSONS) 57,553 m³