

QUANTITY CALCULATION COVER SHEET								
Project	Detailed Design on Port Reactivation Project in La Union Province			Project Code	JC1N004/2N001			
Work Section Title	West Revetment			Pay Item No. (BOQ)	2F-0204			
Quantity Item	Sand Replacement			Unit	m <sup>3</sup>			
<b>Calculation Procedure Applied</b>								
<ol style="list-style-type: none"> <li>1. Calculation of Areas of Sections (Excel)</li> <li>2. Average of Areas of Sections (Excel)</li> <li>3. Calculation of Volume : Average of Areas of Sections times distance between Sections (Excel)</li> </ol>								
<b>References, Calculation Base and Revisions</b>								
<p>See the item of office drawing of west revetment. (2A-10)</p>								
Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Y. G. G. G.			Mr. Inuma		Mr. Ando		
1								
2								
3								

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	West Revetment	Calc. Index No.	
Subject	Sand Replacement	Page No.	Rev.
		References/Notes	
harbor side	33,910.22 m <sup>3</sup>		
sea side	76,747.47 m <sup>3</sup>		
total		109,657.69 m <sup>3</sup>	
		$\approx$ 110,000 m <sup>3</sup>	
harbor side	22,250.82 m <sup>3</sup>		
sea side	62,205.22 m <sup>3</sup>		
additional	13,782.18		
	57,999.4		
		156,341.4	
		$\approx$ 156,400 m <sup>3</sup>	
Prepared by		Checked by	
		/ 1200	/ 1200

West Revetment

3. Sand Replacement (harbor side)

Section No.	Area (m <sup>2</sup> )	Average Area of 2 Sections (m <sup>2</sup> )	Distance Between Sections (m)	Volume (m <sup>3</sup> )
No.0-49.20	0.00	44.37	44.20	1,960.93
No.0-5.00	88.73	88.73	5.00	443.65
No.0'	88.73	65.09	0.00	0.00
No.0	41.44	41.12	0.61	25.08
No.0+0.61	40.80	46.31	7.06	326.95
No.1	51.82	46.31	7.06	326.95
No.2+0.43'	40.80	62.80	0.00	0.00
No.2+0.43	84.80	98.95	8.86	876.65
No.2+9.29	118.09	120.80	6.21	750.17
No.2+15.50	128.51	118.53	2.00	237.06
No.2+17.50	108.55	108.55	7.50	814.13
No.3	108.55	108.55	25.00	2,713.75
No.4	108.55	108.55	9.80	1,063.79
No.4+9.80	108.55	120.65	9.00	1,085.85
No.4+14.86	132.75	132.75	10.14	1,346.09
No.5	132.75	132.75	15.00	1,991.25
No.5+15.00	132.75	120.65	2.00	241.30
No.5+17.00	108.55	108.55	8.00	868.40
No.6	108.55	108.55	25.00	2,713.75
No.7	108.55	108.55	15.00	1,628.25
No.7+15.00	108.55	78.25	6.00	469.50
No.7+21.00	47.95	47.95	4.00	191.80
No.8	47.95	47.95	25.00	1,198.75
No.9	47.95	47.95	25.00	1,198.75
No.10	47.95	47.95	10.00	479.50
No.10+10.00	47.95	43.69	6.00	262.14
No.10+16.00	39.43	56.62	9.00	509.54
No.11	73.80	117.66	12.50	1,470.75
No.11+12.50	161.52	161.52	5.30	856.06
No.11+17.80	161.52	140.16	3.00	420.48
No.11+20.80	118.80	118.80	4.20	498.96
No.12	118.80	118.80	25.00	2,970.00
No.13	118.80	118.80	11.00	1,306.80
No.13+11.00	118.80	118.80	14.00	1,663.20
No.14	118.80	118.80	1.00	118.80

Section No.	Area (m <sup>2</sup> )	Average Area of 2 Sections (m <sup>2</sup> )	Distance Between Sections (m)	Volume (m <sup>3</sup> )
No. 14+1.00	118.80			
		118.80	8.60	1,021.68
No. 14+9.60	118.80			
		118.80	8.40	997.92
No. 14+18.00	118.80			
		59.40	27.50	1,633.50
No. 14+45.50	0.00			
Total			367.44	32,910.22

22,278.88

○West Revetment

4. Sand Replacement (sea side)

Section No.	Area (m <sup>2</sup> )	Average Area of 2 Sections (m <sup>2</sup> )	Distance Between Sections (m)	Volume (m <sup>3</sup> )
No.0	19.00			
		19.00	0.61	11.59
No.0+0.61	19.00			
		21.47	8.13	174.51
No.1	23.93			
		105.17	8.13	854.99
No.2+0.43	186.40			
		268.34	8.86	2,377.49
No.2+9.29	350.28			
		368.31	6.21	2,287.17
No.2+15.50	386.33			
		346.73	2.00	693.46
No.2+17.50	307.13			
		307.13	7.50	2,303.48
No.3	307.13			
		307.13	25.00	7,678.25
No.4	307.13			
		307.13	9.80	3,009.87
No.4+9.80	307.13			
		334.37	9.00	3,009.33
No.4+14.86	361.61			
		362.00	10.14	3,670.63
No.5	362.38			
		362.38	15.00	5,435.70
No.5+15.00	362.38			
		329.88	2.00	659.76
No.5+17.00	297.38			
		297.38	8.00	2,379.04
No.6	297.38			
		297.38	25.00	7,434.50
No.7	297.38			
		297.38	15.00	4,460.70
No.7+15.00	297.38			
		214.88	6.00	1,289.28
No.7+21.00	132.38			
		132.38	4.00	529.52
No.8	132.38			
		132.38	25.00	3,309.50
No.9	132.38			
		132.38	25.00	3,309.50
No.10	132.38			
		132.38	10.00	1,323.80
No.10+10.00	132.38			
		107.71	6.00	646.23
No.10+16.00	83.03			
		120.83	9.00	1,087.47
No.11	158.63			
		224.55	12.50	2,806.88
No.11+12.50	290.47			
		290.49	5.30	1,539.57
No.11+17.80	290.50			
		220.19	3.00	660.57
No.11+20.80	149.88			
		149.88	4.20	629.50
No.12	149.88			
		156.56	25.00	3,913.88
No.13	163.23			
		163.23	11.00	1,795.53
No.13+11.00	163.23			
		163.23	14.00	2,285.22
No.14	163.23			
		163.23	1.00	163.23



Section No.	Area (m <sup>2</sup> )	Average Area of 2 Sections (m <sup>2</sup> )	Distance Between Sections (m)	Volume (m <sup>3</sup> )
No.14+1.00	163.23			
No.14+9.60	163.23	163.23	8.60	1,403.78
No.14+18.00	163.23	163.23	8.40	1,371.13
No.14+45.50	0.00	81.62	27.50	2,244.41
Total			365.88	76,749.47

62,282.<sup>22</sup>







<b>QUANTITY CALCULATION COVER SHEET</b>								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>		JC1N004/2N001		
<b>Work Section Title</b>	East Revetment			<b>Pay Item No. (BOQ)</b>		2F-0205		
<b>Quantity Item</b>	Sand Replacement			<b>Unit</b>		m <sup>3</sup> .		
<b>Calculation Procedure Applied</b>								
<ol style="list-style-type: none"> <li>1. Calculation of Areas of Sections (Excel)</li> <li>2. Average of Areas of Sections (Excel)</li> <li>3. Calculation of Volume : Average of Areas of Sections times distance between Sections (Excel)</li> </ol>								
<b>References, Calculation Base and Revisions</b>								
See the item of offshore dumping of east revetment. (2A-11)								
Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Garcia			Mr. Truma		Mr. Ando		
1								
2								
3								

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	East Revetment	Calc. Index No.	
Subject	Sand Replacement	Page No.	Rev.
	References/ Notes	harbor side	28,576.74 m <sup>3</sup>
sea side		total	83,699.28 m <sup>3</sup>
			= [83,600] m <sup>3</sup>
Prepared by		Checked by	
	/ /200		/ /200

○East Revetment

3. Sand Replacement (harbor side)

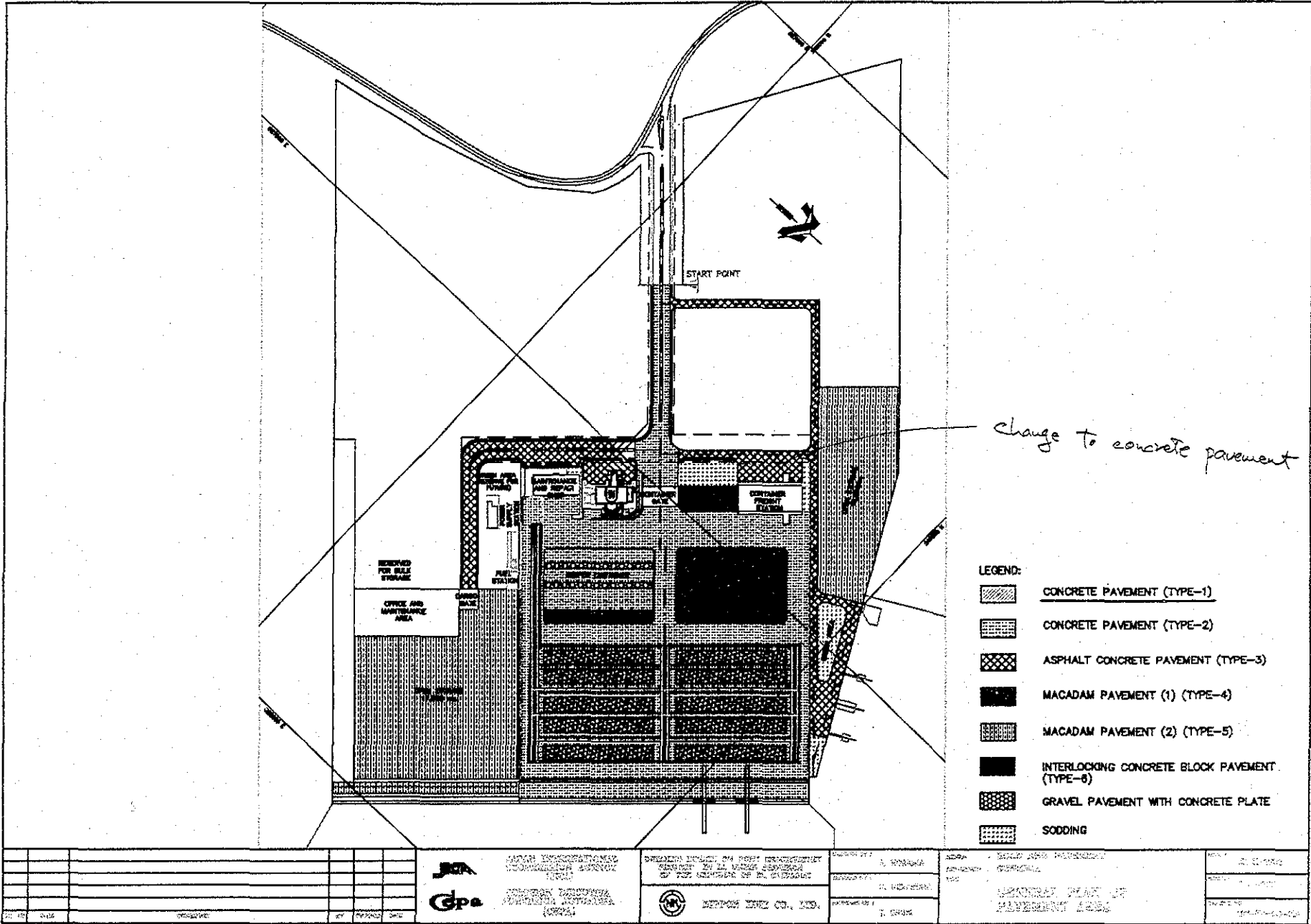
Section No.	Area (m <sup>2</sup> )	Average Area of 2 Sections (m <sup>2</sup> )	Distance Between Sections (m)	Volume (m <sup>3</sup> )
No.0+3.00	0.00	12.78	2.00	25.56
No.1	25.56	91.60	9.00	824.40
No.1+9.00	157.64	169.84	6.60	1,120.94
No.1+15.60	182.04	200.59	9.40	1,885.55
No.2	219.14	221.20	1.00	221.20
No.2+1.00	223.25	199.63	4.00	798.50
No.2+5.00	176.00	176.00	10.50	1,848.00
No.2+15.50	176.00	124.00	8.00	992.00
No.2+23.50	72.00	72.00	1.50	108.00
No.3	72.00	72.00	25.00	1,800.00
No.4	72.00	72.00	3.00	216.00
No.4+3.00	72.00	96.00	10.00	960.00
No.4+13.00	120.00	120.00	12.00	1,440.00
No.5	120.00	120.00	18.00	2,160.00
No.5+18.00	120.00	139.18	7.00	974.26
No.6	158.36	167.18	3.00	501.54
No.6+3.00	176.00	176.00	22.00	3,872.00
No.7	176.00	176.00	8.00	1,408.00
No.7+8.00	176.00	182.06	2.00	364.11
No.7+10.00	188.11	160.36	8.00	1,282.84
No.7+18.00	132.60	132.60	7.00	928.20
No.8	132.60	132.60	23.00	3,049.80
No.8+23.00	132.60	119.05	2.00	238.10
No.9	105.50	70.85	6.00	425.10
No.9+6.00	36.20	36.20	19.00	687.80
No.10	36.20	36.20	11.00	398.20
No.10+11.00	36.20	18.10	4.00	72.40
No.10+15.00	0.00			
Total			242.00	28,576.94

○East Revetment

4. Sand Replacement (Sea side)

Section No.	Area (m <sup>2</sup> )	Average Area of 2 Sections (m <sup>2</sup> )	Distance Between Sections (m)	Volume (m <sup>3</sup> )
No.0+3.00	0.00			
		51.96	2.00	103.91
No.1	103.91			
		239.79	9.00	2,158.07
No.1+9.00	375.66			
		405.13	6.60	2,673.86
No.1+15.60	434.60			
		479.51	9.40	4,507.35
No.2	524.41			
		529.40	1.00	529.40
No.2+1.00	534.38			
		459.19	4.00	1,836.76
No.2+5.00	384.00			
		384.00	10.50	4,032.00
No.2+15.50	384.00			
		268.00	8.00	2,144.00
No.2+23.50	152.00			
		152.00	1.50	228.00
No.3	152.00			
		152.00	25.00	3,800.00
No.4	152.00			
		152.00	3.00	456.00
No.4+3.00	152.00			
		191.50	10.00	1,915.00
No.4+13.00	231.00			
		231.00	12.00	2,772.00
No.5	231.00			
		231.00	18.00	4,158.00
No.5+18.00	231.00			
		263.13	7.00	1,841.91
No.6	295.26			
		309.63	3.00	928.89
No.6+3.00	324.00			
		324.00	22.00	7,128.00
No.7	324.00			
		324.00	8.00	2,592.00
No.7+8.00	324.00			
		336.30	2.00	672.60
No.7+10.00	348.60			
		273.30	8.00	2,186.40
No.7+18.00	198.00			
		198.00	7.00	1,386.00
No.8	198.00			
		198.00	23.00	4,554.00
No.8+23.00	198.00			
		175.25	2.00	350.50
No.9	152.50			
		99.25	6.00	595.50
No.9+6.00	46.00			
		46.00	19.00	874.00
No.10	46.00			
		46.00	11.00	506.00
No10+11.00	46.00			
		23.00	4.00	92.00
No10+15.00	0.00			
Total			242.00	55,022.14

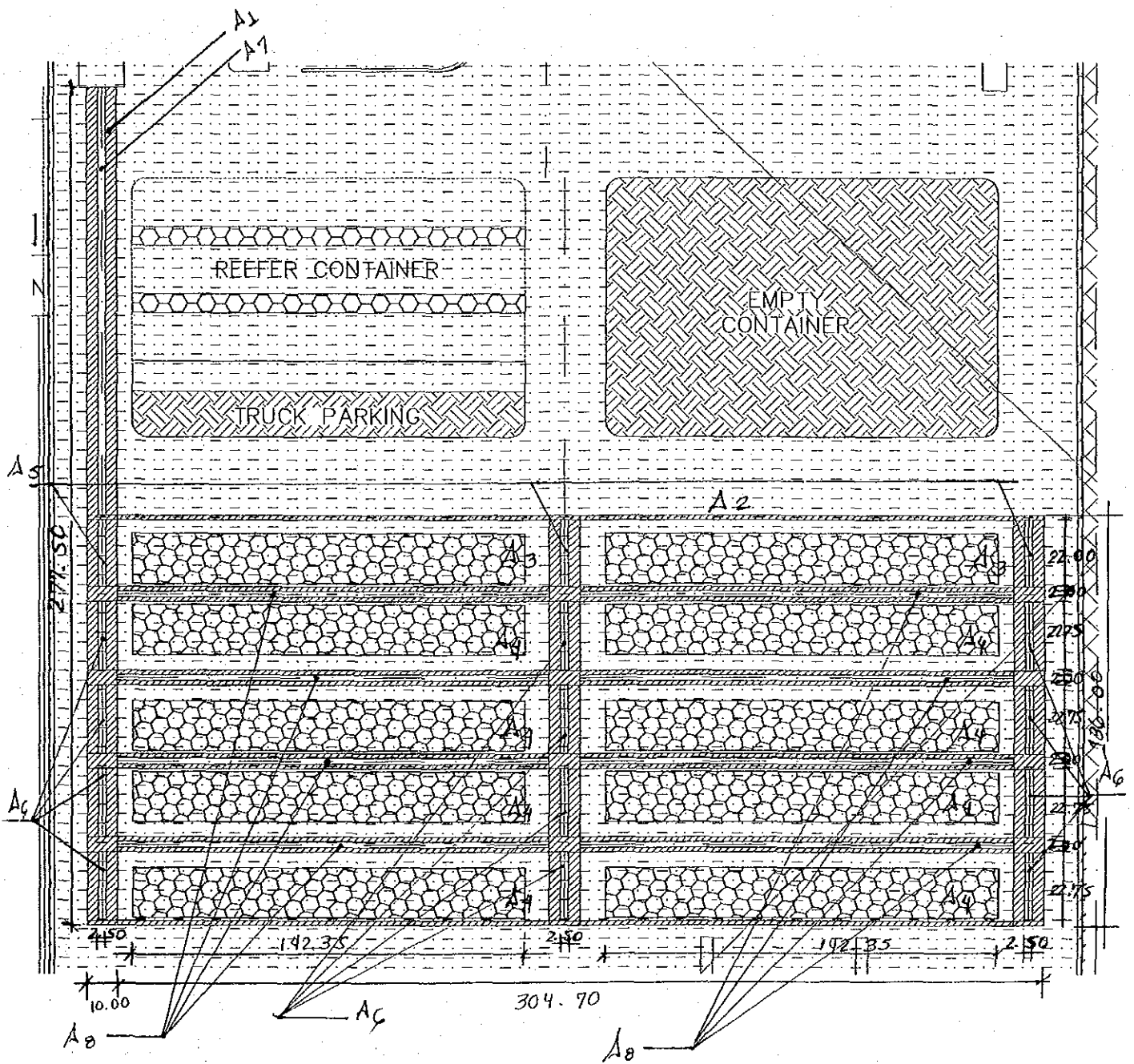
QUANTITY CALCULATION COVER SHEET								
Project	Detailed Design on Port Reactivation Project in La Union Province			Project Code	JC1N004/2N001			
Work Section Title	CONCRETE PAVEMENT (TYPE 1)			Pay Item No. (BOQ)	2G-0101			
Quantity Item	SUBGRADE PREPARATION			Unit	m <sup>2</sup>			
<b>Calculation Procedure Applied</b>								
<p>Pavement area was computed using geometric formulas.</p> <p>The area was computed with two decimal for section area and zero decimal for total.</p>								
<b>References, Calculation Base and Revisions</b>								
<p>References: Tender Drawings:</p> <p>DW - PV - 00 - 001 General Plan of Pavement Area</p>								
Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Garcia	26 June 2002		M. Inuma		Mr. Ando		
1	<del> </del>							
2								
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*change to concrete pavement*

- LEGEND:
- CONCRETE PAVEMENT (TYPE-1)
  - CONCRETE PAVEMENT (TYPE-2)
  - ASPHALT CONCRETE PAVEMENT (TYPE-3)
  - MACADAM PAVEMENT (1) (TYPE-4)
  - MACADAM PAVEMENT (2) (TYPE-5)
  - INTERLOCKING CONCRETE BLOCK PAVEMENT (TYPE-6)
  - GRAVEL PAVEMENT WITH CONCRETE PLATE
  - SODDING

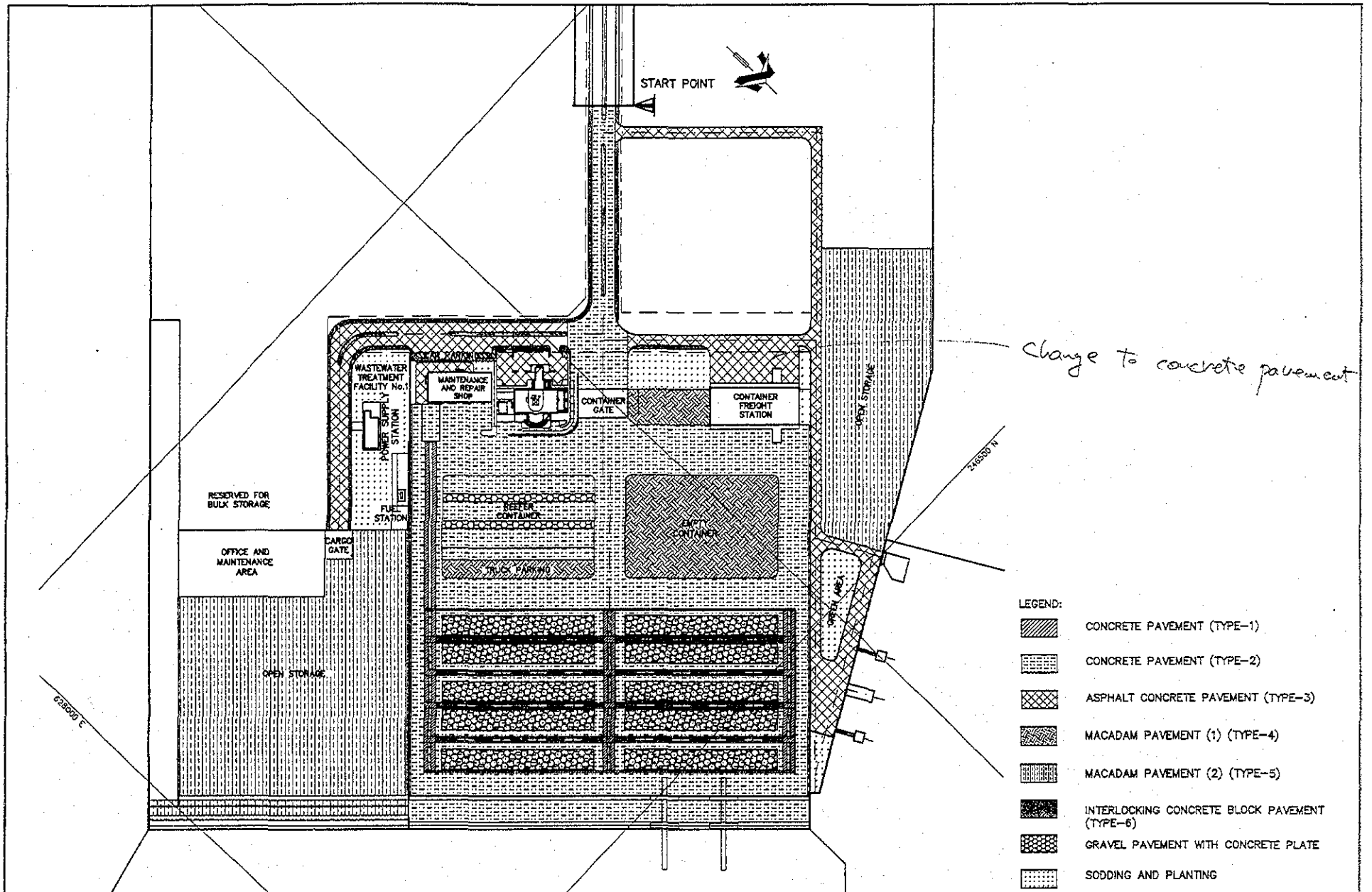
			DOKUMENTAAR BEPLANNING TECHNISCHE Afdeling ROTTERDAM			DINGENHOUTENBURG ROTTERDAM			1964		
			DE WERKMAATSCHAPPY VAN 'T BUREAU VAN 'T BUREAU VAN 'T BUREAU			1. VERBODEN 2. VERBODEN 3. VERBODEN			1. VERBODEN 2. VERBODEN 3. VERBODEN		
10 20 30 40 50 60 70 80 90 100			10 20 30 40 50 60 70 80 90 100			10 20 30 40 50 60 70 80 90 100			10 20 30 40 50 60 70 80 90 100		



Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	CONCRETE PAVEMENT (TYPE 1)	Calc. Index No.	
Subject	SUBGRADE PREPARATION	Page No.	Rev.
		References/ Notes	
$A_1 = (277.50\text{ m})(10\text{ m}) = 2,775.00\text{ m}^2$			
$A_2 = (186\text{ m})(304.70\text{ m}) = 41,439.20\text{ m}^2$		49,272	
$A_3 = (22\text{ m})(142.35\text{ m})(2) = 6,263.40\text{ m}^2$		44,212-70	
$A_4 = (22.75\text{ m})(142.35\text{ m})(8) = 25,907.70\text{ m}^2$			
$A_5 = (2.50\text{ m})(22\text{ m})(3) = 165.00\text{ m}^2$			
$A_6 = (2.50\text{ m})(22.75\text{ m})(12) = 682.50\text{ m}^2$			
$A_7 = (2.50\text{ m})(141.55\text{ m}) = 353.88\text{ m}^2$			
$A_8 = (2.0\text{ m})(142.35\text{ m})(8) = 2,277.60\text{ m}^2$			
$A = (A_1 + A_2) - (A_3 + A_4 + A_5 + A_6 + A_7 + A_8)$			
$A = (2,775\text{ m}^2 + 41,439.20\text{ m}^2) - (6,263.40 + 25,907.70\text{ m}^2 +$			
$165.00\text{ m}^2 + 682.50\text{ m}^2 + 353.88\text{ m}^2 + 2,277.60\text{ m}^2)$			
$A = 8,584.12\text{ m}^2 \approx 8,600\text{ m}^2$		$A = 8,600\text{ m}^2$	2
Prepared by		Checked by	
Karlo G.		24 / June / 2002	
		1 / 200	

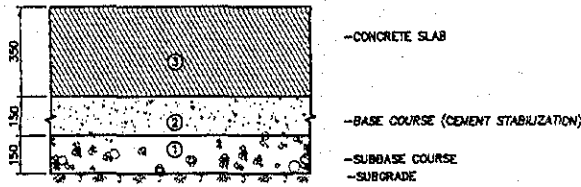


<b>QUANTITY CALCULATION COVER SHEET</b>								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>	JC1N004/2N001			
<b>Work Section Title</b>	CONCRETE PAVEMENT (TYPE 1)			<b>Pay Item No. (BOQ)</b>	2G-0102			
<b>Quantity Item</b>	SUBBASE COURSE			<b>Unit</b>	m <sup>3</sup>			
<b>Calculation Procedure Applied</b>								
<p>Pavement area was computed using geometric formulas.                      Pavement volume was obtained multiplying the area                      to the thickness of each type of course.                      The volume was computed with zero decimal for                      total.</p>								
<b>References, Calculation Base and Revisions</b>								
<p>References: Tender Drawings:</p> <p>DW - PV - 00 - 001 General Plan of Pavement Area                      RW - PV - 00 - 004 Typical Section of Pavement and Road</p>								
Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Garcia	26 June 2002		Mr. Truma		Mr. Ando		
1	<del>_____</del>							
2								
3								

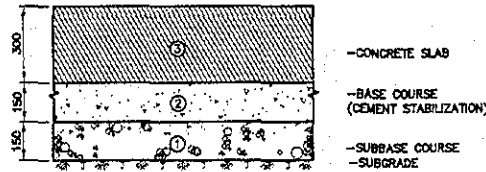


REV. NO.		DATE	COORDINATE	BY	APPROVED	DATE	JICA JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	COMISION EJECUTIVA PORTUARIA AUTONOMA (CEPA)	NIPPON KOEI CO., LTD.	DESIGNED BY:	SECTION: ROAD AND PAVEMENT	DATE: JULY/2002
										ORDERED BY:	SUB-SECTION: GENERAL	SCALE: 1 : 3000
										TITLE: GENERAL PLAN OF PAVEMENT AREA	DRAWING NO: DW-PV-00-001	

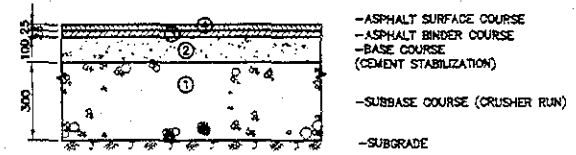
TYPICAL SECTION OF PAVEMENT  
SCALE: 1:20



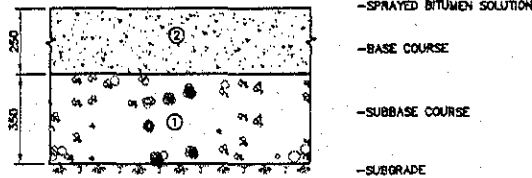
TYPE 1 CONCRETE PAVEMENT  
(FOR R.T.G. TRAFFIC LANE)



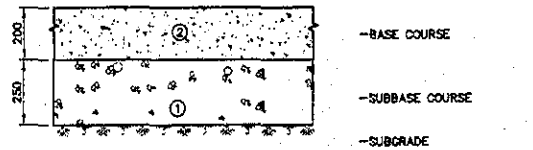
TYPE 2 CONCRETE PAVEMENT



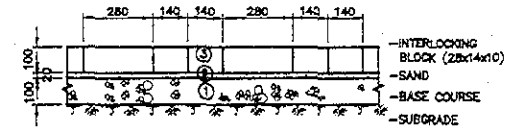
TYPE 3 ASPHALT CONCRETE PAVEMENT



TYPE 4 MACADAM PAVEMENT (1)

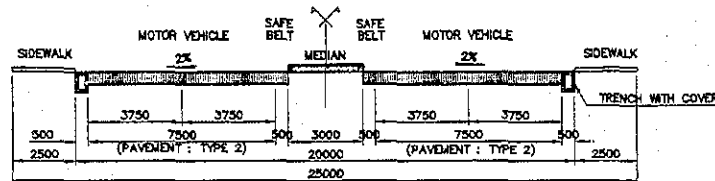


TYPE 5 MACADAM PAVEMENT (2)

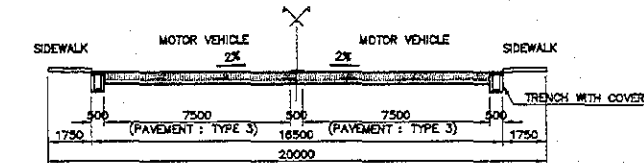


TYPE 6 INTERLOCKING CONCRETE BLOCK PAVEMENT  
(FOR SIDEWALK)

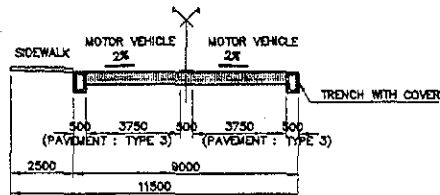
TYPICAL SECTION ROADS  
SCALE: 1:200



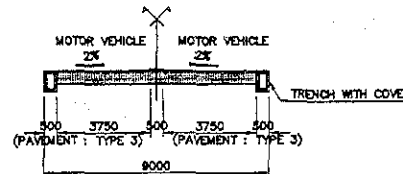
TYPICAL SECTION OF MAIN ROAD (TYPE A)



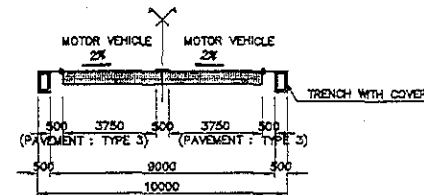
TYPICAL SECTION OF SUB-TRUNK ROAD (TYPE B)



TYPICAL SECTION OF BRANCH ROAD (TYPE C)



TYPICAL SECTION OF BRANCH ROAD (TYPE D)



TYPICAL SECTION OF BRANCH ROAD (TYPE E)

REV. NO.	DATE	COORDINATE	BY	APPROVED	DATE	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 :	SECTION :	DATE :
								CHECKED BY :	ROAD AND PAVEMENT	JULY/2002
								TITLE :	SCALE :	INDICATE
								TYPICAL SECTION OF PAVEMENT AND ROAD	DRAWING NO. :	DW-PV-00-004

<b>Project</b>	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
<b>Section</b>	CONCRETE PAVEMENT (TYPE J)	Calc. Index No.	
<b>Subject</b>	SUBBASE COURSE	Page No.	Rev.
$A = 8,600 \text{ m}^2$ $t = 15 \text{ cm}$ $V = (8,600 \text{ m}^2)(0.15 \text{ m})$ $V = 1,290 \text{ m}^3 \approx 1,300 \text{ m}^3$		References/Notes	
		$V = 1,300 \text{ m}^3$	
Prepared by		Checked by	
Karla G.		26 / June / 2002	
		/ / 200	

<b>QUANTITY CALCULATION COVER SHEET</b>								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>	JC1N004/2N001			
<b>Work Section Title</b>	CONCRETE PAVEMENT (TYPE I)			<b>Pay Item No. (BOQ)</b>	EG - 0103			
<b>Quantity Item</b>	BASE COURSE			<b>Unit</b>	M <sup>3</sup>			
<b>Calculation Procedure Applied</b>								
<p>Pavement area was computed using geometric formulas                      Pavement Volume was obtained multiplying the area                      to the thickness of each type of course.                      The volume was computed with zero decimal for                      total.</p>								
<b>References, Calculation Base and Revisions</b>								
<p>References : Tender Drawings :</p> <p>DW - PV - 00 - 001 General Plan of Pavement Area                      DW - PV - 00 - 004 Typical Section of Pavement and Road.                      (Same as "Subbase Course")</p>								
Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Gorcia	26 June 2002		Mr. Inuma		Mr. Ando		
1	<del>KA</del>							
2								
3								

<b>Project</b>	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
<b>Section</b>	CONCRETE PAVEMENT	Calc. Index No.	
<b>Subject</b>	BASE COURSE	Page No.	Rev.
		References/ Notes	
$A = 8,600 \text{ m}^2$ $t = 15 \text{ cm}$ $V = (8,600 \text{ m}^2) (0.15 \text{ m})$ $V = 1,290 \text{ m}^3 \approx 1,300 \text{ m}^3$		$V = 1,300 \text{ m}^3$	
Prepared by		Checked by	
/ /200		/ /200	

**QUANTITY CALCULATION COVER SHEET**

<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province	<b>Project Code</b>	JC1N004/2N001
<b>Work Section Title</b>	CONCRETE PAVEMENT (TYPE 1)	<b>Pay Item No. (BOQ)</b>	2G-0104
<b>Quantity Item</b>	PRIME COATING	<b>Unit</b>	m <sup>2</sup>

Calculation Procedure Applied

Pavement area was computed using geometric formulas.

The area was computed with zero decimal for total.

References, Calculation Base and Revisions

References : Tender Drawings:

SW - PV - 00 - 001 General Plan of Pavement Area.

(Some as "Subbase Course")

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Garcia	26 June 2002		Mr. Truma		Mr. Ando		
1	<del>Karla Garcia</del>							
2								
3								

<b>Project</b>	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
<b>Section</b>	CONCRETE PAVEMENT (TYPE 1)	Calc. Index No.	
<b>Subject</b>	PRIME COATING	Page No.	Rev.
$A = 8,600 \text{ m}^2$		References/Notes	
		$A = 8,600 \text{ m}^2$	
Prepared by		Checked by	
Kaila G.		24 / June / 2002	
		1 / 200	



**QUANTITY CALCULATION COVER SHEET**

<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province	<b>Project Code</b>	JC1N004/2N001
<b>Work Section Title</b>	CONCRETE PAVEMENT (TYPE 1)	<b>Pay Item No. (BOQ)</b>	2G-010501
<b>Quantity Item</b>	CONCRETE SLAB	<b>Unit</b>	m <sup>3</sup>

**Calculation Procedure Applied**

Pavement area was computed using geometric formulas.  
 Pavement volume was computed multiplying the area to  
 the thickness of each type of course.  
 The volume was computed with zero decimal for totals.

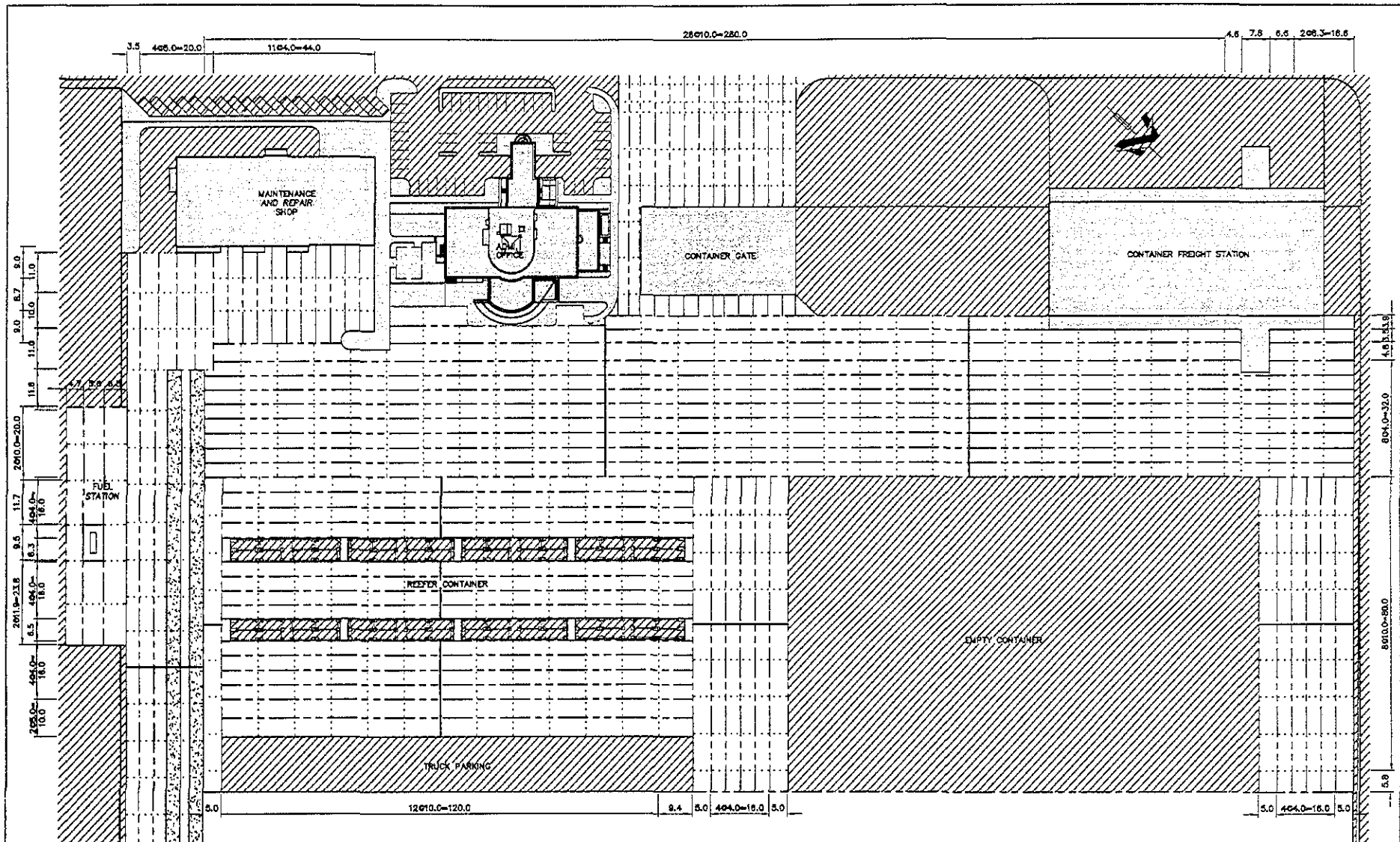
**References, Calculation Base and Revisions**

References: Tender Drawings:  
 DW - PV - 00 - 001 General Plan of Pavement Area  
 DW - PV - 00 - 004 Typical Section of Pavement and Road  
 (Same as "Subbase Course")

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Garcia	26 June 2002		Mr. Inuma		Mr. Ando		
1	<del>KA</del>							
2								
3								

<b>Project</b>	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
<b>Section</b>	CONCRETE PAVEMENT (TYPE I)	Calc. Index No.	
<b>Subject</b>	CONCRETE SLAB	Page No.	Rev.
		References/ Notes	
$A = 8,600 \text{ m}^2$ $t = 35 \text{ cm}$ $V = (8,600 \text{ m}^2) (35 \text{ cm})$ $V = 3010 \text{ m}^3 \approx 3,020 \text{ m}^3$		$V = 3,020 \text{ m}^3$	
Prepared by		Checked by	
Kala G.		26 June/2002	
		1 /200	

QUANTITY CALCULATION COVER SHEET								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>	JC1N004/2N001			
<b>Work Section Title</b>	CONCRETE PAVEMENT (TYPE -J)			<b>Pay Item No. (BOQ)</b>	2G-010502			
<b>Quantity Item</b>	REINFORCEMENT AND JOINT BAR			<b>Unit</b>	Kg			
<b>Calculation Procedure Applied</b>								
<p>Reinforcement and joint bar was computer for container pavement.</p> <p>Reinforcement length was computed summarizing all the distances of the reinforcement.</p>								
<b>References, Calculation Base and Revisions</b>								
<p>References : Tender Drawings :</p> <p>DW - PV - 01 - 005 Joint Arrangement of Concrete Pavement (1)</p> <p>DW - PV - 01 - 006 Joint Arrangement of Concrete Pavement (2)</p> <p>DW - PV - 01 - 008 Joint Arrangement of Concrete Pavement (4)</p>								
Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Kyla Garcia	1 July 2002		Mr. Inuma		Mr. Ando		
1								
2								
3								



LEGEND:   
 [Hatched Box] CONCRETE PAVEMENT (TYPE-1)   
 [White Box] CONCRETE PAVEMENT (TYPE-2)   
 [Diagonal Lines] BUILDING AND OTHERS   
 [Cross-hatched Box] WITHOUT CONCRETE PAVEMENT   
 [Dashed Line] LONGITUDINAL CONSTRUCTION JOINT   
 [Dotted Line] CONTRACTION JOINT   
 [Solid Line] EXPANSION JOINT

REV. NO.	DATE	COORDINATE	BY	APPROVED	DATE

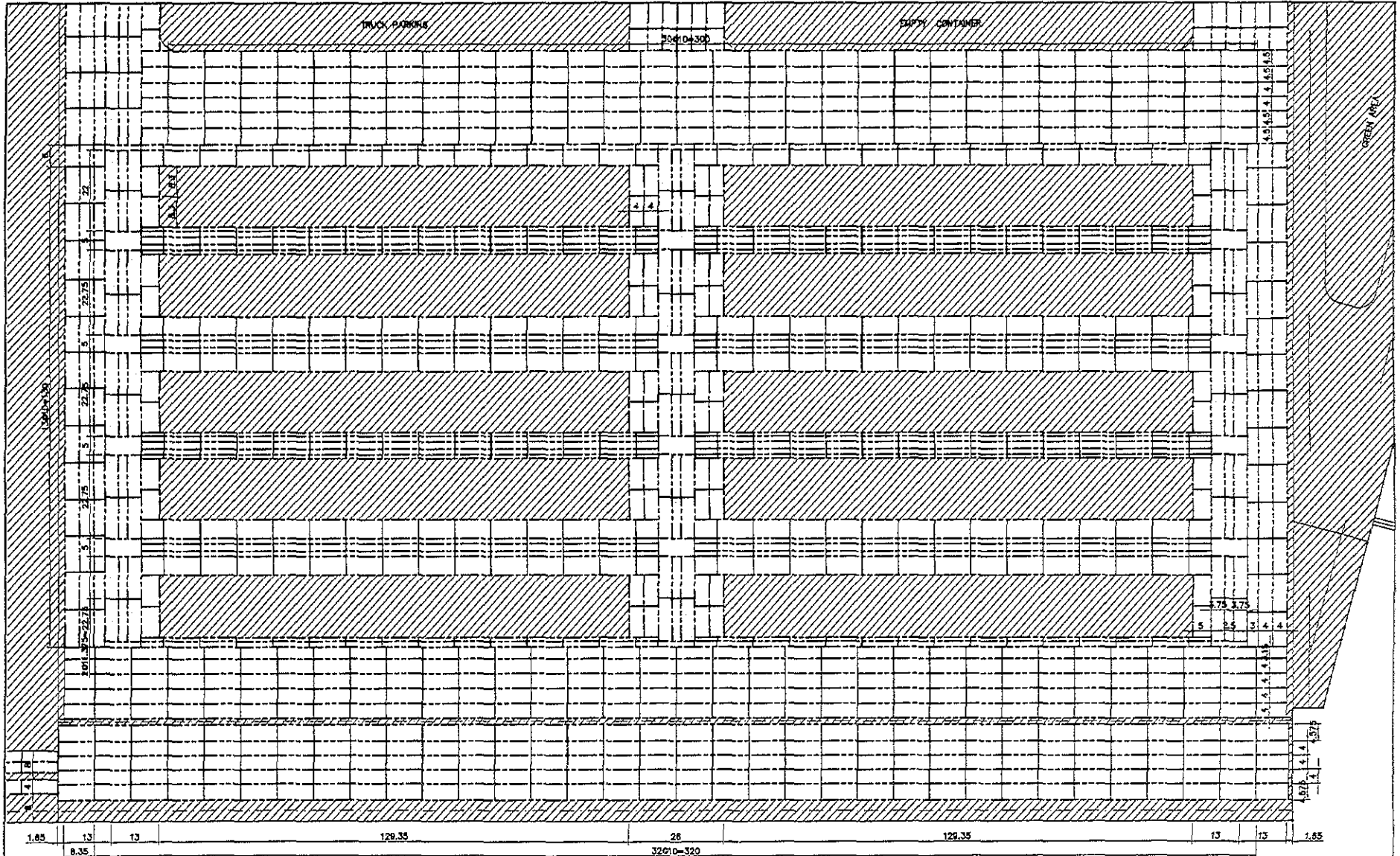
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)   
 COMISION EJECUTIVA PORTUARIA AUTONOMA (CEPA)

DETAILED DESIGN ON PORT REACTIVATION PROJECT IN LA UNJON PROVINCE OF THE REPUBLIC OF EL SALVADOR   
 NIPPON KOKI CO., LTD.

DESIGNED BY:   
 CHECKED BY:   
 APPROVED BY:

SECTION : ROAD AND PAVEMENT   
 SUB-SECTION : PORT SERVICE ROAD AND CONTAINER YARD PAVEMENT.   
 TITLE : JOINT ARRANGEMENT OF CONCRETE PAVEMENT -(1)

DATE : JULY/2002   
 SCALE : 1 : 1000   
 DRAWING NO. : DW-PV-01-005



LEGEND:

- LONGITUDINAL CONSTRUCTION
- CONTRACTION
- EXPANSION
- CONCRETE PAVEMENT (TYPE-1)
- CONCRETE PAVEMENT (TYPE-2)
- WITHOUT CONCRETE PAVEMENT

REV. NO.	DATE	COORDINATE	BY	APPROVED	DATE

JICA  
 JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Gpa  
 COMISION EJECUTIVA PORTUARIA AUTONOMA (CEPA)

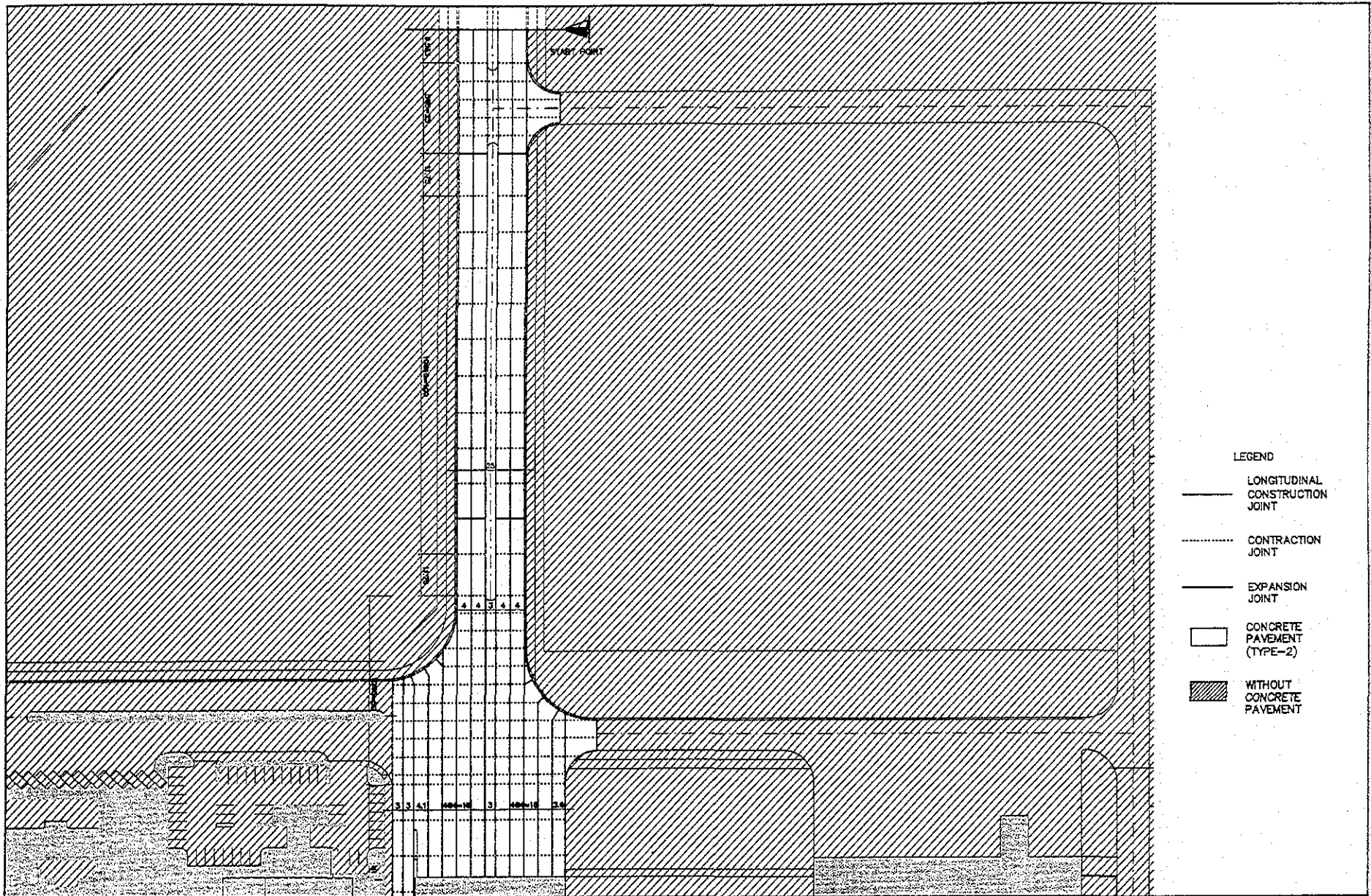
DETAILED DESIGN ON PORT REACTIVATION PROJECT IN LA UNION PROVINCE OF THE REPUBLIC OF EL SALVADOR

NIPPON KOEI CO., LTD.

DESIGNED BY: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_  
 APPROVED BY: \_\_\_\_\_

SECTION: ROAD AND PAVEMENT  
 SUB-SECTION: PORT SERVICE ROAD AND CONTAINER YARD PAVEMENT.  
 TITLE: JOINT ARRANGEMENT OF CONCRETE PAVEMENT -(2)



DATE: JULY/2002  
 SCALE: 1 : 1000  
 DRAWING NO: DW-PV-01-006




LEGEND

- LONGITUDINAL CONSTRUCTION JOINT
- ..... CONTRACTION JOINT
- EXPANSION JOINT
- CONCRETE PAVEMENT (TYPE-2)
- ▨ WITHOUT CONCRETE PAVEMENT

REV. NO.	DATE	COORDINATE	BY	APPROVED	DATE

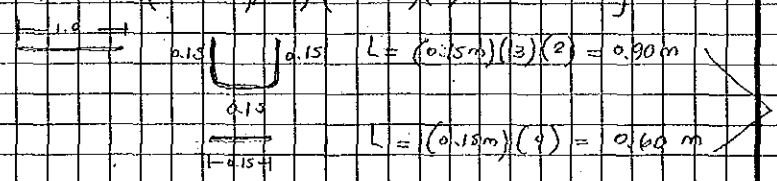

**JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)**  

**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 : PORT SERVICE ROAD AND CONTAINER YARD PAVEMENT  
 TITLE : JOINT ARRANGEMENT OF CONCRETE PAVEMENT--(4)

DATE : JULY/2002  
 SCALE : 1 : 1000  
 DRAWING NO. : DW-PV-01-008

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	CONCRETE PAYEMENT (TYPE - I)	Calc. Index No.	
Subject	REINFORCEMENT AND JOINT BAR	Page No.	Rev.
Container Yard Pavement :		References/Notes	
1. Longitudinal Construction Joint :			
1.1 length (m) :			
$L = (142.35m)(18)(2) + 309.70m + (10m)(31) + (22m)(12) + (22.75m)(48) + (148.55m)(2)$ $= 7,677.10m \approx 7,678m$			
1.2 Total Re-Bar (Kg)			
$0.32 \Rightarrow w = (6.23 \text{ Kg/m})(1.00m) = 6.23 \text{ Kg}$			
$0.13 \Rightarrow w = (0.995 \text{ Kg/m})(1.50m)(2) = 2.99 \text{ Kg}$			
 $L = (0.15m)(3)(2) = 0.90m$ $L = (0.15m)(4) = 0.60m$		$L = 1.50m$	
$W = 6.23 \text{ Kg} + 2.99 \text{ Kg} = 9.22 \text{ Kg}$			
No sets = 7,678			
$W_T = (9.22 \text{ Kg})(7,678) = 70,791.16 \text{ Kg}$ $\approx 70,792 \text{ Kg}$		$W_1 = 70,792 \text{ Kg}$	
2. Contraction Joint			
2.1 length (m) :			
$L = (3.95m)(54) + (1.50m)(272) + (5m)(24) = 730.31m$ $\approx 731m$			
2.2 Total Re-bar			
$w = 9.22 \text{ Kg}$			
No sets = 731			
$W_T = (9.22 \text{ Kg})(731) = 6,739.82 \text{ Kg} \approx 6,740 \text{ Kg}$		$W_2 = 6,740 \text{ Kg}$	
Prepared by		Checked by	
Kalo G.		4 July 2002	
		1 / 200	

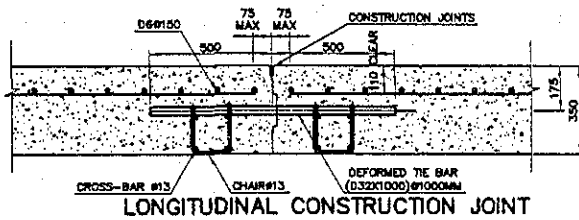
Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	CONCRETE PAVEMENT (TYPE -1)	Calc. Index No.	
Subject	REINFORCEMENT AND JOINT BAR	Page No.	Rev.
3. Expansion Joint.		References/ Notes	
3.1 Length (m)			
$L = (1.50m)(2) + (3.75m)(2) = 37.50 m \approx 38 m$			
3.2 Total Re-bar (Kg)			
$D32 \Rightarrow w = (6.23 \text{ kg/m})(0.60m) = 3.74 \text{ kg}$			
$D13 \Rightarrow w = (0.993 \text{ kg/m})(1.50m)(2) = 2.99 \text{ kg}$			
$w = 3.74 \text{ kg} + 2.99 \text{ kg} = 6.73 \text{ kg}$			
No. Sets = 38			
$W_T = (6.73 \text{ kg})(38) = 255.74 \text{ kg} \approx 256 \text{ kg}$		$W_3 = 256 \text{ kg}$	
4. Joint with existing concrete.			
Note: There isn't.			
$W_T = (70,792 + 6,740 + 256) \text{ kg} = 77,788 \text{ kg} \approx$		$W_T = 77,800 \text{ kg}$	
Prepared by		Checked by	
Koila G.		1 / 200	



QUANTITY CALCULATION COVER SHEET								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>	JC1N004/2N001			
<b>Work Section Title</b>	CONCRETE PAVEMENT (TYPE -J)			<b>Pay Item No. (BOQ)</b>	2G-010503			
<b>Quantity Item</b>	ELAS TIGH BOARD			<b>Unit</b>	m <sup>2</sup>			
<b>Calculation Procedure Applied</b>								
<p>Elas tigh board area was computed for container yard pavement.</p> <p>Area was computed multiplying the length of elas tigh to the width.</p>								
<b>References, Calculation Base and Revisions</b>								
<p>References : Tender Drawings:</p> <p>DW - PV - 01 - 009 Details of Concrete Pavement</p>								
Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Garcia	1 July 2002		Mr. Inuma		Mr. Ando		
1	<del>Karla Garcia</del>							
2								
3								

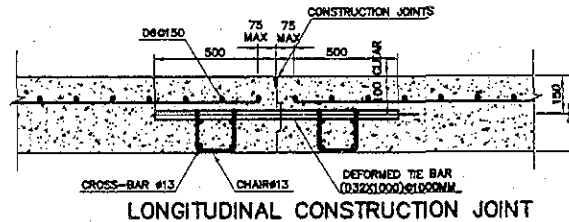
DETAILS OF JOINT

CONCRETE PAVEMENT (TYPE-1)  
SCALE 1:20

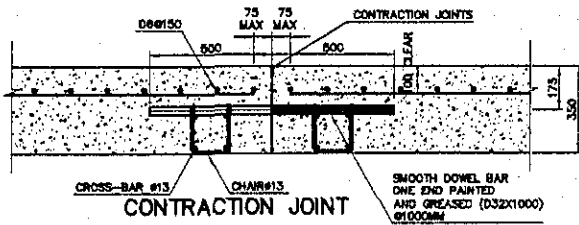


LONGITUDINAL CONSTRUCTION JOINT

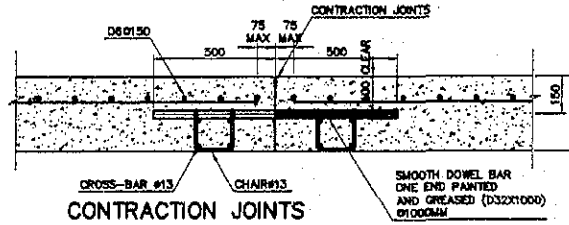
CONCRETE PAVEMENT (TYPE-2)  
SCALE 1:20



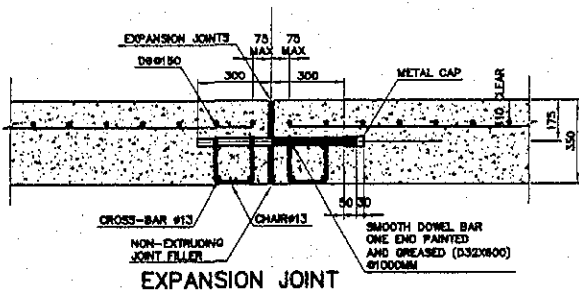
LONGITUDINAL CONSTRUCTION JOINT



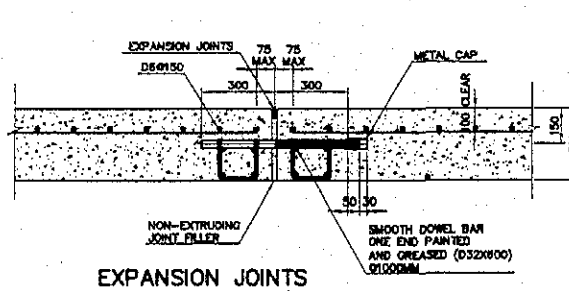
CONTRACTION JOINT



CONTRACTION JOINTS

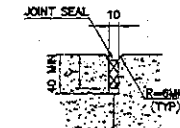


EXPANSION JOINT

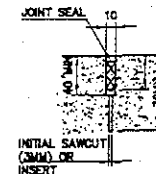


EXPANSION JOINTS

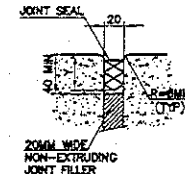
DETAILS OF JOINT SEALING  
SCALE 1:5



CONSTRUCTION JOINTS

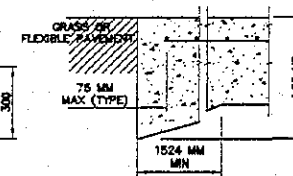


CONTRACTION JOINTS

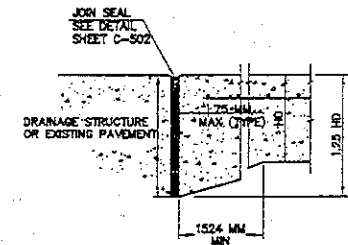


EXPANSION JOINTS

JOINTS BETWEEN CONCRETE PAVEMENT AND OTHERS



THICKENED EDGE BUTT CONSTRUCTION JOINT



THICKENED EDGE EXPANSION JOINT

REV. NO.	DATE	DESCRIPTION	BY	APPROVED	DATE

JICA  
GPA  
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: PORT SERVICE ROAD AND CONTAINER YARD PAVEMENT  
TITLE: DETAILS OF CONCRETE PAVEMENT

DATE: JULY/2002  
SCALE: INDICATED  
DRAWING NO: DW-PV-01-009

<b>Project</b>	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
<b>Section</b>	CONCRETE PAVEMENT (TYPE -1)	Calc. Index No.	
<b>Subject</b>	ELAS TIGH BOARD	Page No.	Rev.
<p>Container Yard Pavement :</p> <p>Expansion Joint :</p> <p>L = 38 m</p> <p>Width = 35 cm</p> <p><math>A = (0.35 \text{ m})(38 \text{ m}) = 13.30 \text{ m}^2 \approx 20 \text{ m}^2</math></p>		<p>References/ Notes</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-left: auto;"> <math>A = 20 \text{ m}^2</math> </div>	
Prepared by		Checked by	
Kato G.		1 / 200	
4 July 2002			

QUANTITY CALCULATION COVER SHEET								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>	JC1N004/2N001			
<b>Work Section Title</b>	CONCRETE PAVEMENT (TYPE -1)			<b>Pay Item No. (BOQ)</b>	2G-010504			
<b>Quantity Item</b>	JOINT FILTER			<b>Unit</b>	m <sup>2</sup>			
<b>Calculation Procedure Applied</b>								
<p>Joint filter area was computed for container yard pavement area.</p> <p>Area was computed multiplying the length of joint filter to the width.</p>								
<b>References, Calculation Base and Revisions</b>								
<p>References: Tender Drawings:</p> <p>DW - PV - 01 - 009 Details of Concrete Pavement</p> <p>(Same as "Elastic Tigh Board")</p>								
Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Garcia	4 July 2002		Mr. Inuma		Mr. Ando		
1	<del>KA</del>							
2								
3								

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	CONCRETE PAVEMENT (TYPE -J)	Calc. Index No.	
Subject	JOINT FILTER	Page No.	Rev.
<p>Container Yard Pavement :</p> <p>- Longitudinal Construction Joint :</p> <p><math>L = 7,678 \text{ m}</math></p> <p>Width = 4 cm</p> <p><math>A = (0.04 \text{ m})(7,678 \text{ m}) = 307.12 \text{ m}^2 \approx 308 \text{ m}^2</math></p>		References/ Notes	
		<p><math>A = 308 \text{ m}^2</math></p>	
<p>- Connection Joint</p>			
<p><math>L = 731 \text{ m}</math></p>			
<p>Width = 4 cm</p>			
<p><math>A = (0.04 \text{ m})(731 \text{ m}) = 29.24 \text{ m}^2 \approx 30 \text{ m}^2</math></p>		<p><math>A = 30 \text{ m}^2</math></p>	
<p><math>A_T = (308 + 30) \text{ m}^2 = 338 \text{ m}^2 \approx</math></p>		<p><math>A_T = 340 \text{ m}^2</math></p>	
<p>Prepared by</p>		<p>Checked by</p>	
<p>4 July 2002</p>		<p>1 200</p>	

QUANTITY CALCULATION COVER SHEET			
Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	CONCRETE PAVEMENT (TYPE-1)	Pay Item No. (BOQ)	2G-010505
Quantity Item	IRON MESH	Unit	m <sup>2</sup>

Calculation Procedure Applied


Iron Mesh area was computed for container yard pavement area.  
Area was computed using geometric formulas and sectioning the area into small sections area.

References, Calculation Base and Revisions

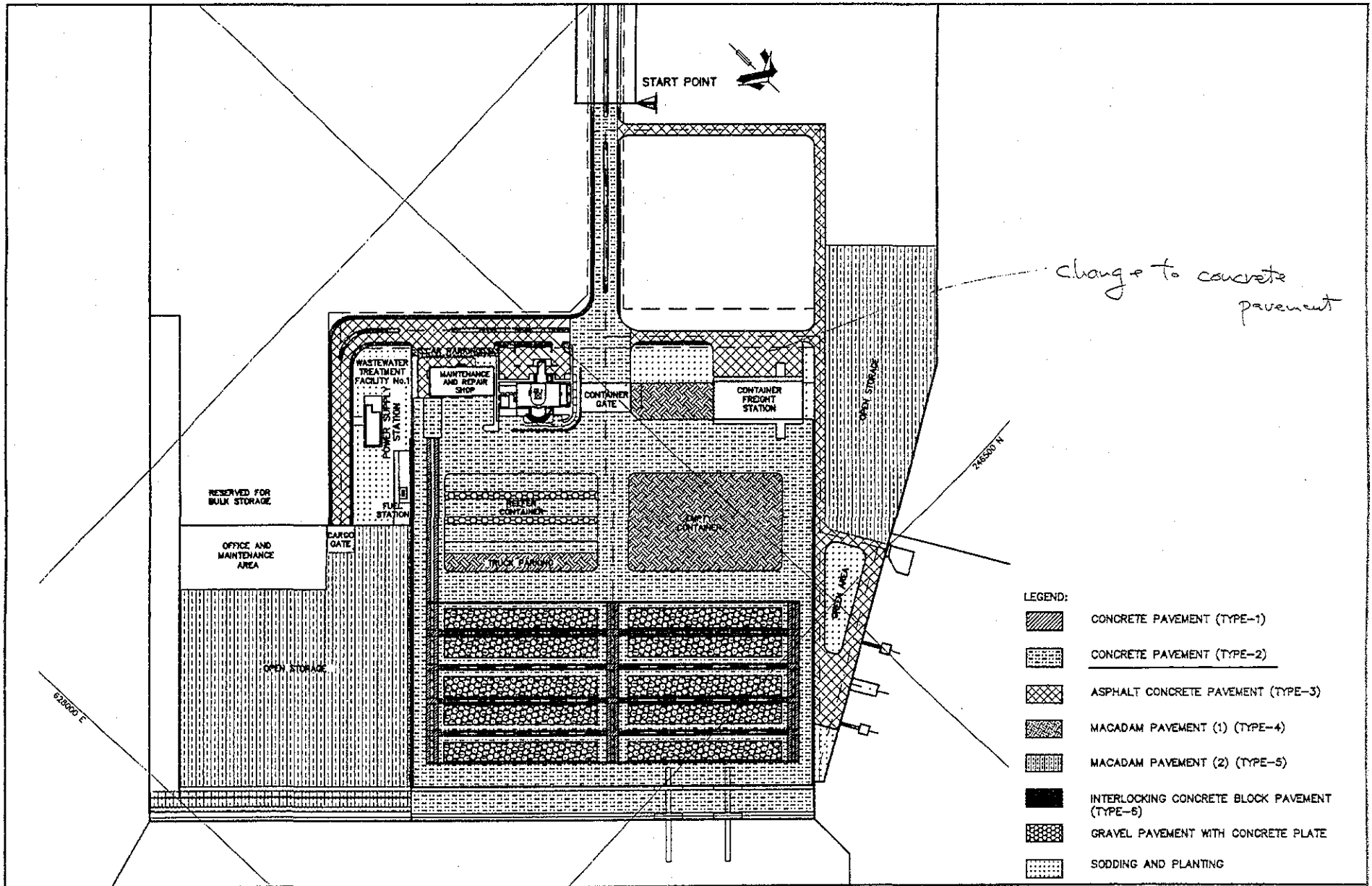
References: Tender Drawings:  
DW - PV - 00 - 001 General Plan of Pavement Area.  
(Same as "Subbase Course")

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Garcia	5 July 2002		Mr. Inuma		Mr. Ando		
1	<del>KA</del>							
2								
3								

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	CONCRETE PAVEMENT (TYPE -1)	Calc. Index No.	
Subject	IRON MESH	Page No.	Rev.
<p>Container Yard Pavement:</p> <p>A1:</p> $A_1 = (277.50 \text{ m})(10 \text{ m}) = 2,775.00 \text{ m}^2$ $A_2 = (136.00 \text{ m})(304.70 \text{ m}) = 41,439.20 \text{ m}^2$ $A_1 = 44,214.20 \text{ m}^2$ <p>A2:</p> $A_1 = (22 \text{ m})(142.35 \text{ m})(2) = 6,263.40 \text{ m}^2$ $A_2 = (22.75 \text{ m})(142.35 \text{ m})(8) = 25,907.70 \text{ m}^2$ $A_3 = (2.50 \text{ m})(22 \text{ m})(3) = 165.00 \text{ m}^2$ $A_4 = (2.50 \text{ m})(22.75 \text{ m})(12) = 682.50 \text{ m}^2$ $A_5 = (2.50 \text{ m})(141.55 \text{ m}) = 353.88 \text{ m}^2$ $A_6 = (2.00 \text{ m})(142.35 \text{ m})(8) = 2,277.60 \text{ m}^2$ $A_2 = 35,650.08 \text{ m}^2$ $A_T = A_1 - A_2 = 8,564.12 \text{ m}^2 \approx$		<p>References/Notes</p>	
		$A = 8,600 \text{ m}^2$	
Prepared by		Checked by	
Korlo G.		5 July 2002	
		1 / 200	

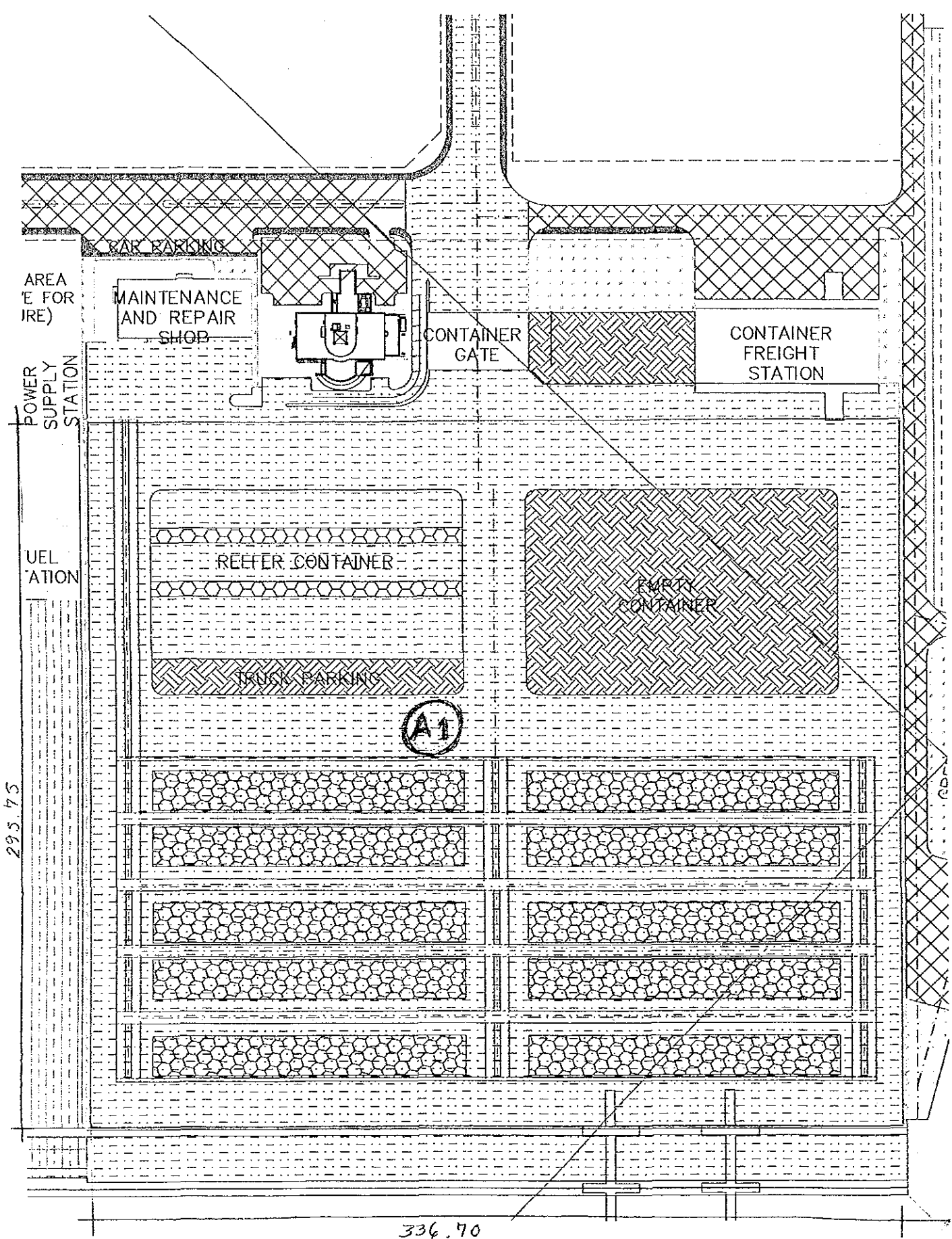
<b>QUANTITY CALCULATION COVER SHEET</b>								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>		JC1N004/2N001		
<b>Work Section Title</b>	CONCRETE PAVEMENT (TYPE 2)			<b>Pay Item No. (BOQ)</b>		2G-0201		
<b>Quantity Item</b>	SUBGRADE PREPARATION			<b>Unit</b>		m <sup>2</sup>		
<b>Calculation Procedure Applied</b>								
<p>Payment area was computed sectioning the preparation area into small section areas and using geometric formulas.</p> <p>The area was computed with two decimal for section area and zero decimal for total.</p>								
<b>References, Calculation Base and Revisions</b>								
<p>References: Tender Drawings:</p> <p>DW - PV - 00 - 001 General Plan of Pavement Area.</p>								
Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Garcia	26 June 2002		Mr. Inuma		Mr. Ando		
1								
2								
3								

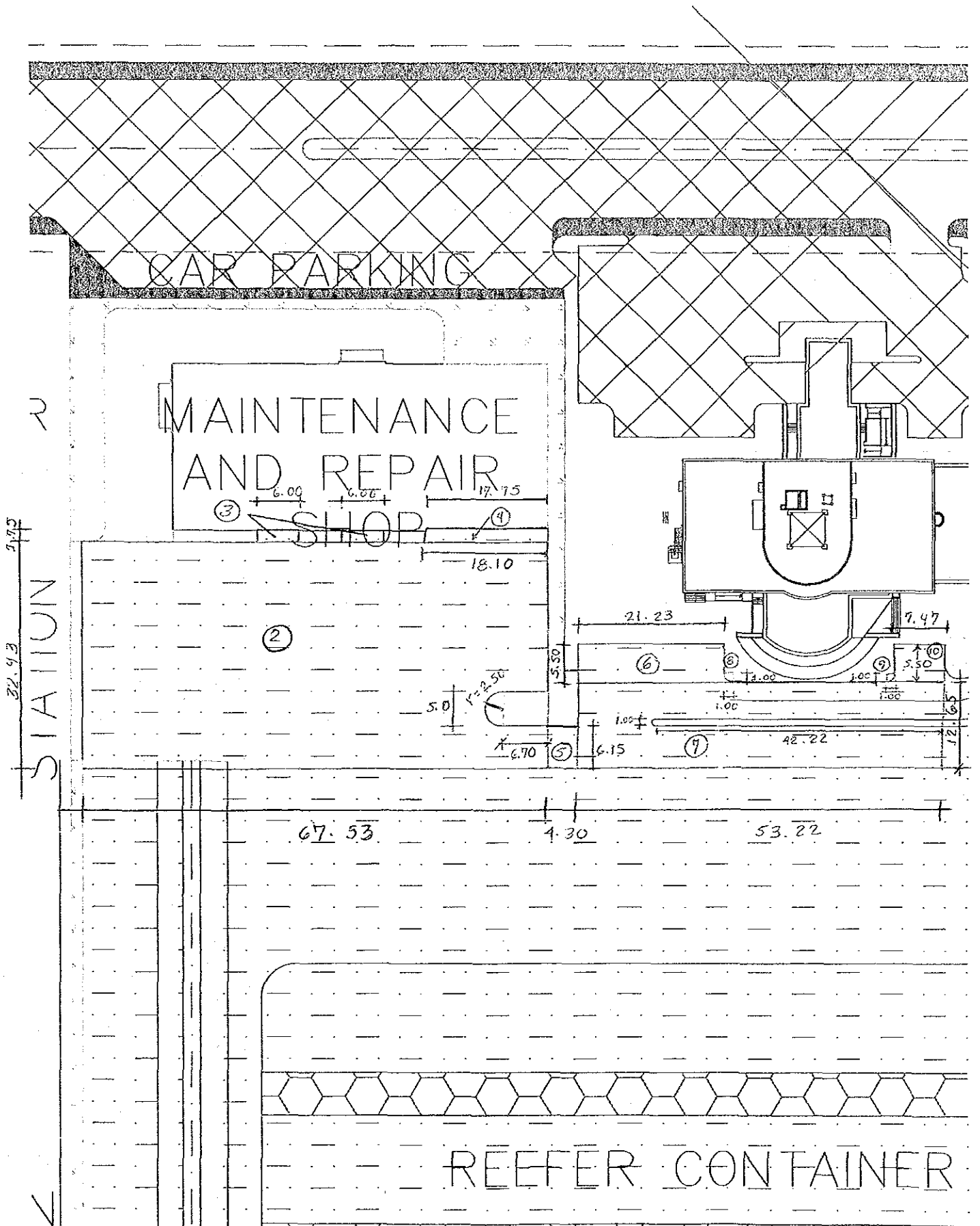


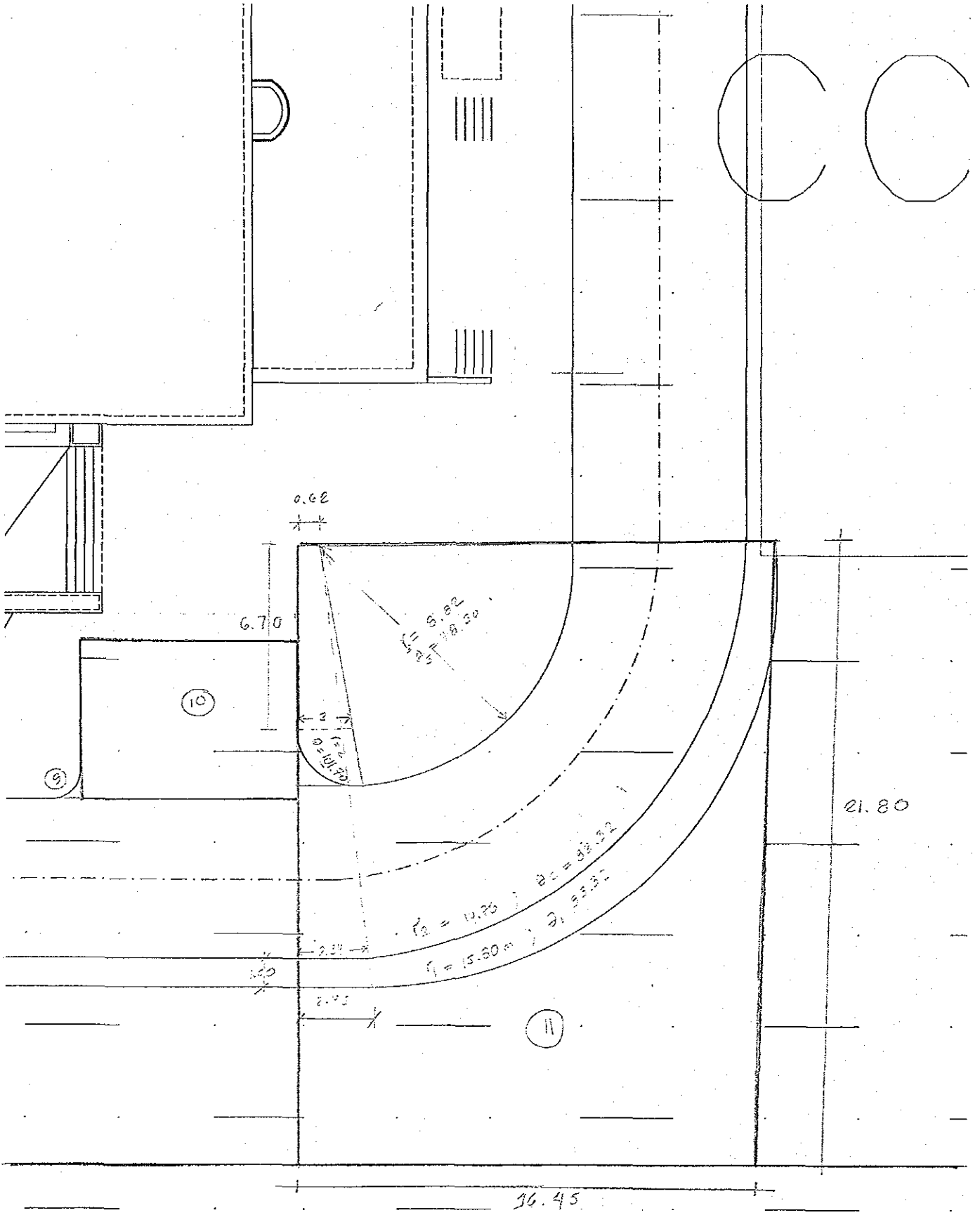


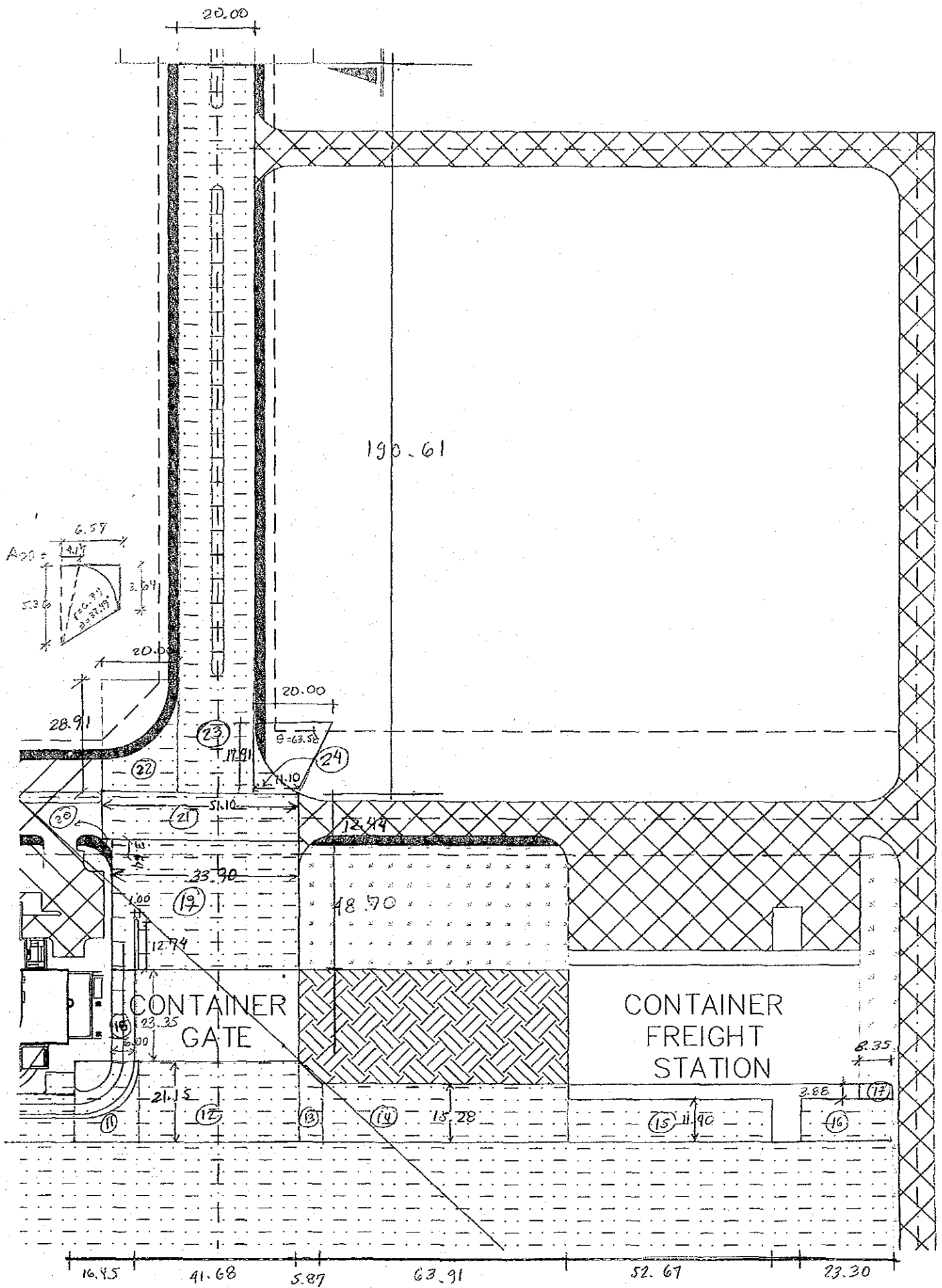
- LEGEND:
- CONCRETE PAVEMENT (TYPE-1)
  - CONCRETE PAVEMENT (TYPE-2)
  - ASPHALT CONCRETE PAVEMENT (TYPE-3)
  - MACADAM PAVEMENT (1) (TYPE-4)
  - MACADAM PAVEMENT (2) (TYPE-5)
  - INTERLOCKING CONCRETE BLOCK PAVEMENT (TYPE-6)
  - GRAVEL PAVEMENT WITH CONCRETE PLATE
  - SODDING AND PLANTING

JICA JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		COMISION EJECUTIVA PORTUARIA AUTONOMA (CEPA)		NIPPON KOSI CO., LTD.		SECTION : ROAD AND PAVEMENT SUB-SECTION : GENERAL TITLE : GENERAL PLAN OF PAVEMENT AREA		DATE : JULY/2002 SCALE : 1 : 3000 DRAWING NO. : DW-PV-00-001	
REV. NO.	DATE	COORDINATE	BY	APPROVED	DATE	DESIGNED BY :	CHECKED BY :	APPROVED BY :	









Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	CONCRETE PAVEMENT (TYPE 2)	Calc. Index No.	
Subject	SUBBASE COURSE	Page No.	Rev.
$A_1 = (326.70 \text{ m})(295.75 \text{ m}) = 97,378.03 \text{ m}^2$			References/ Notes
$A_2 = (32.93 \text{ m})(67.53 \text{ m}) - (6.70 \text{ m})(3 \text{ m}) - \frac{\pi(2.50 \text{ m})^2}{2} = 2180.44 \text{ m}^2$			
$A_3 = (1.70 \text{ m})(6 \text{ m})(2) = 20.40 \text{ m}^2$			
$A_4 = \frac{(17.75 \text{ m} + 18.10 \text{ m})(9)}{2} = 35.85 \text{ m}^2$			
$A_5 = (4.30 \text{ m})(6.15 \text{ m}) = 26.45 \text{ m}^2$			
$A_6 = (5.50 \text{ m})(21.23 \text{ m}) = 116.77 \text{ m}^2$			
$A_7 = (12.65 \text{ m})(53.22 \text{ m}) - \left[ (42.22 \text{ m})(1 \text{ m}) + \frac{\pi(0.5 \text{ m})^2}{2} \right] = 630.62 \text{ m}^2$			
$A_8 = (1 \text{ m})(1 \text{ m}) - \frac{\pi(1)^2}{4} = 0.21 \text{ m}^2$			
$A_9 = (1 \text{ m})(1 \text{ m}) - \frac{\pi(1)^2}{4} = 0.21 \text{ m}^2$			
$A_{10} = (5.50 \text{ m})(7.47 \text{ m}) = 41.09 \text{ m}^2$			
$A_{11} = (16.45 \text{ m})(21.80 \text{ m}) - \left\{ \frac{\pi(15.88 \text{ m})(82.32^\circ)}{360^\circ} - \left[ \frac{\pi(14.76 \text{ m})(83.32^\circ)}{360^\circ} + \frac{\pi(8.82 \text{ m})^2(78.30^\circ)}{360^\circ} + \frac{\pi(2)^2(101.70^\circ)}{360^\circ} + \frac{(4 \text{ m} + 0.62 \text{ m})(6.70 \text{ m})}{2} + \frac{3.34 \text{ m} \times 2.45 \text{ m} \times (0.92 \text{ m})}{2} \right\} = 265.77$			
$A_{12} = (41.68 \text{ m})(21.15 \text{ m}) = 881.53 \text{ m}^2$			
$A_{13} = \frac{(15.23 \text{ m} + 21.15 \text{ m})(3.87 \text{ m})}{2} = 106.92 \text{ m}^2$			
$A_{14} = (63.91 \text{ m})(15.28 \text{ m}) = 976.54 \text{ m}^2$			
$A_{15} = (11.40 \text{ m})(52.67 \text{ m}) = 600.44 \text{ m}^2$			
$A_{16} = (11.40 \text{ m})(23.30 \text{ m}) = 265.62 \text{ m}^2$			
$A_{17} = (8.35 \text{ m})(3.88 \text{ m}) = 32.40 \text{ m}^2$			
$A_{18} = (6.00 \text{ m})(23.35 \text{ m}) = 140.10 \text{ m}^2$			
$A_{19} = (98.70 \text{ m})(33.90 \text{ m}) - \left[ (12.74 \text{ m})(1 \text{ m}) + \frac{\pi(2.5 \text{ m})^2}{2} \right] = 3,637.83 \text{ m}^2$			
Prepared by		Checked by	
Kario G. 26 June 2002		/ 1200	

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	CONCRETE PAVEMENT (TYPE 2)	Calc. Index No.	
Subject	SUBGRADE PREPARATION	Page No.	Rev.
$A_{20} = \left[ \frac{(3.64 + 5.36 \text{ m})}{2} (6.57 \text{ m}) \right] - \left[ \frac{\pi (6.94)^2 (37.44^\circ)}{360^\circ} \right]$ $= \frac{(4.17 \text{ m})(5.36 \text{ m})}{2} = 3.31 \text{ m}^2$		References/Notes	
$A_{21} = (51.10 \text{ m})(12.44 \text{ m}) = 635.68 \text{ m}^2$			
$A_{22} = (20 \text{ m})(23.31 \text{ m}) - \frac{\pi (20 \text{ m})^2}{4} = 264.04 \text{ m}^2$			
$A_{23} = (20 \text{ m})(190.61 \text{ m}) = 3,812.20 \text{ m}^2$			
$A_{24} = \left[ \frac{(11.15 \text{ m} + 20)}{2} (17.91 \text{ m}) \right] - \frac{\pi (20 \text{ m})^2 (43.58^\circ)}{360^\circ} = 50.36 \text{ m}^2$			
$A = 112,312.04 \text{ m}^2$			
$A_{\text{prov. 2}} = A - A_{\text{prov. 1}} - A_{\text{prov. 9}} - A_{\text{prov. (ground with conc. plank)}}$ $= 112,312.04 \text{ m}^2 - 8,617.12 \text{ m}^2 - 15,066.83 - 29,970.02 \text{ m}^2$ $= 65,658.04 \text{ m}^2 \approx 66,000 \text{ m}^2$			
$A = 66,000 \text{ m}^2 + \frac{(15.00 \text{ m})(6.5 \text{ m})}{2} = 66,975 \text{ m}^2$ <p style="text-align: center;">Fuel Station Area</p>			
$A_{\text{road}} = 3216 \text{ m}^2$ <p style="text-align: center;">Small craft berth</p> $760 \text{ m}^2 (95 \times 80)$			
$A = 66,975 + 3216 + 760 = 71,551 \text{ m}^2 \quad A_T = 71,000 \text{ m}^2$			
Prepared by		Checked by	
Kotio G.		26 June 2002	
		1 / 200	