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	U type ditch (A-2)	**Pay Item No. (BOQ)**	2H-060508
Quantity Item	Elas tigh board	**Unit**	m^2

Calculation Procedure Applied

Elas tigh board will be used as a joint, every 10 m.

References, Calculation Base and Revisions

See the item of excavation and disposal of U type ditch. (2H-0605)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Gonzales			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	U type ditch (A-2)	Calc. Index No.	
Subject	Elastigh board	Page No.	Rev.

References/ Notes

$N = 2.70 \div 1.0 = 2.7$

$A_1 = 1.05 \times 0.2 \times 2 + 1.4 \times 0.2$

$= 0.7\ m^2$

$A_T = 0.7 \times 2.7 = \boxed{1.8.9}\ m^2$

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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	J type ditch (A-2)	**Pay Item No. (BOQ)**	2H-060509
Quantity Item	Backfill	**Unit**	m^3

Calculation Procedure Applied

Backfill volume was computed by excavation volume minus crushed stone, lean concrete and J type ditch.

References, Calculation Base and Revisions

See the item of excavation and disposal of J type ditch (2H-0605)

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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	U type ditch (A-2)	Calc. Index No.	
Subject	Backfill	Page No.	Rev.

References/ Notes

Excavation 954 m^3

Crushed stone 64.8 m^3

Lean concrete 43.2 m^3

U type ditch

$V = 1.25 \times 1.4 \times 270 = 472.5\ m^3$

Backfill

$V = 954 - 64.8 - 43.2 - 472.5$

$= 373.5$

$\simeq \boxed{374}\ m^3$

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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	Plate type ditch (A-2)	**Pay Item No. (BOQ)**	2H - 060510
Quantity Item	Compaction	**Unit**	m^2

Calculation Procedure Applied

Compaction area was computed by sectional length by the length.

References, Calculation Base and Revisions

See the item 1 excavation and disposal of plate type ditch (2H - 060501)

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0	Karla Garcia			Mr. Inuma		Mr. Ando		
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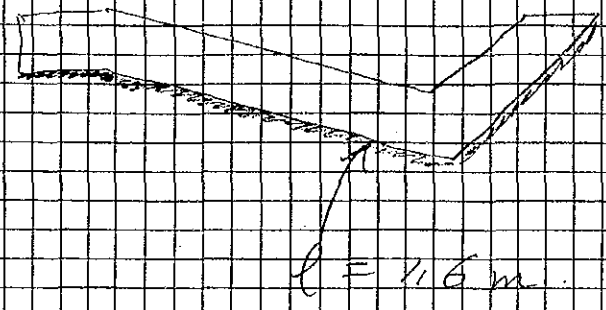
Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Plate type ditch (A-2)	Calc. Index No.	
Subject	Compaction	Page No.	Rev.

References/ Notes



$\ell = 1.6\ m$

$A = 1.6 \times 760 = 1216$

$= \boxed{1220}\ m^2$

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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	Plate type ditch (A-2)	Pay Item No. (BOQ)	2H-060511
Quantity Item	Concrete	Unit	m^3

Calculation Procedure Applied

Volume of concrete for plate type ditch was computed by multiplying sectional area by the length.

References, Calculation Base and Revisions

See the item of excavation and disposal of U-type ditch. (2H-0605-)

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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Plate type ditch (A-2)	Calc. Index No.	
Subject	Concrete	Page No.	Rev.

References/ Notes

$A = 0.15 \times 1.45 = 0.22\ m^2$

$L = 760\ m$

$V = 0.22 \times 760 = 167.2$

$\fallingdotseq \boxed{168}\ m^3$

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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	Vertical drainage (A-2)	**Pay Item No. (BOQ)**	2H-060512
Quantity Item	Excavation and Disposal	**Unit**	m^3

Calculation Procedure Applied

Excavation volume was computed by multiplying Volume/1 spot by numbers.

References. Calculation Base and Revisions

See the item of excavation and disposal of U type ditch. (2H-0605)

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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Vertical drainage. (A~2)	Calc. Index No.	
Subject	Excavation and Disposal	Page No.	Rev.

References/ Notes

V/1spot

$V_1 = 1.67 + 4.8 + 2.04$

$= 8.51/m^3$

$N/ = 2/$

$V = 8.51/ \times 2/ = 178.7$

$\simeq \boxed{179}\ m^3$

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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	Vertical drainage (A-2)	**Pay Item No. (BOQ)**	2H-060513
Quantity Item	compaction	**Unit**	m^2

Calculation Procedure Applied

Compaction area was computed by multiplying area/1spot by numbers.

References, Calculation Base and Revisions

See the item of excavation and disposal of O type ditch (2H-0605)

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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Vertical drainage (CA-2)	Calc. Index No.	
Subject	Compaction	Page No.	Rev.

References/ Notes

Area/1spot

$A_1 = 1.56 + 4.25 + 7.90$

$= 13.71 \text{ m}^2$

$N = 21$

$A = 13.71 \times 21 = 287.9$

$\simeq \boxed{288} \text{ m}^2$

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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	Vertical drainage (A-2)	Pay Item No. (BOQ)	2H-060514
Quantity Item	Form	Unit	m²

Calculation Procedure Applied

Area of form for vertical drainage was computed by multiplying area/1 spot by numbers.

References, Calculation Base and Revisions

See the item of excavation and disposal of U-type ditch (2H-0605).

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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Vertical drainage (A-2)	Calc. Index No.	
Subject	Form	Page No.	Rev.

References/ Notes

Area / 1 spot

$A_1 = 6.04 + 13.5 + 11.0$

$= 30.54\ m^2$

$N = 21$

$A = 30.54 \times 21 = 641.34$

$= \boxed{642}\ m^2$

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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	Vertical drainage (A-2)	**Pay Item No. (BOQ)**	2H-060515
Quantity Item	Concrete	**Unit**	m^3

Calculation Procedure Applied

Volume of concrete for vertical drainage was calculated by multiplying volume/1spot by numbers.

References, Calculation Base and Revisions

See the item of excavation and disposal of U type ditch. (2H-0605)

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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Vertical drainage (CA-2)	Calc. Index No.	
Subject	Concrete	Page No.	Rev.

References/ Notes

Volume / 1 spot

$V_1 = 0.67 + 2.0 + 1.82$

$= 4.49 \ m^3$

$N = 21$

$V = 4.49 \times 21 = 94.29$

$= \boxed{94.3 \ m^3}$

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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	Vertical drainage (A-2)	**Pay Item No. (BOQ)**	2H-060516
Quantity Item	Backfill	**Unit**	m^3

Calculation Procedure Applied

Backfill volume for vertical drainage was computed by multiplying volume/1spot by numbers.

References. Calculation Base and Revisions

See the item of excavation and disposal of U type ditch. (2H-0605)

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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Vertical drainage (A-2)	Calc. Index No.	
Subject	Backfill	Page No.	Rev.

References/ Notes

Volume / 1 spot

$V_1 = 0.45 + 1.50 + 0.44$

$= 2.39\ m^3$

$N = 21$

$V = 2.39 \times 21 = 50.19$

$= \boxed{50.2}\ m^3$

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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	Catch basin	**Pay Item No. (BOQ)**	2H-060601
Quantity Item	Excavation and Disposal	**Unit**	m^3

Calculation Procedure Applied

Volume of excavation for catch basin was computed by multiplying section area by width.

References, Calculation Base and Revisions

DW-S1-01-023.

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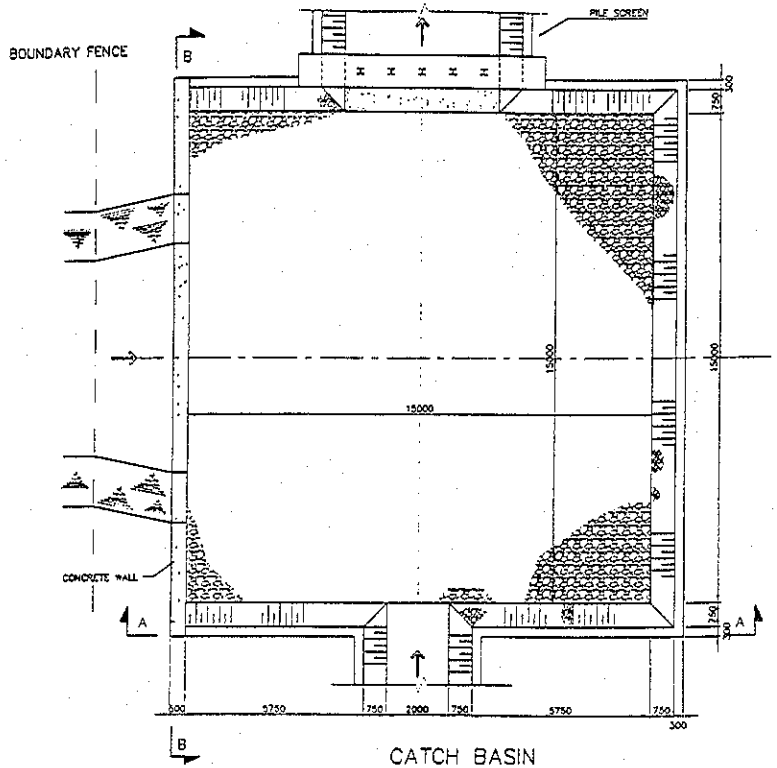
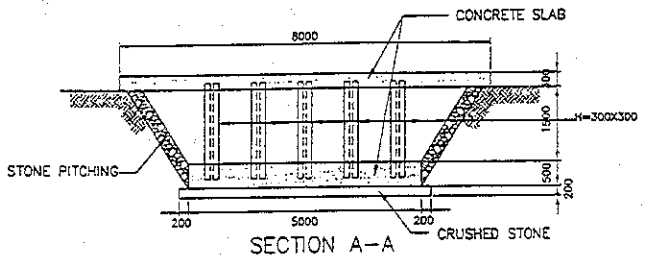
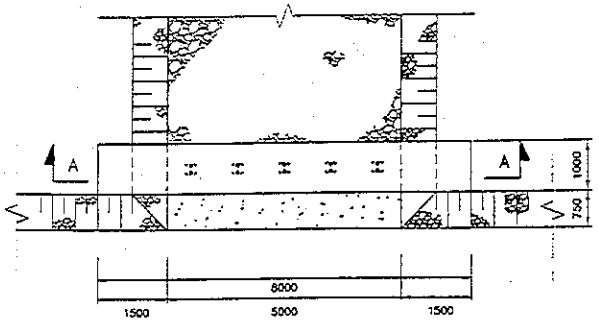


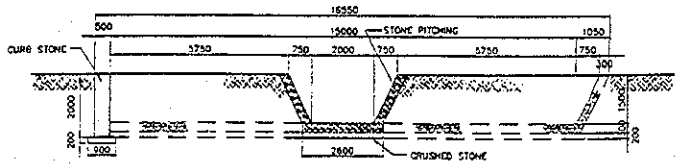
CATCH BASIN
SCALE 1:150



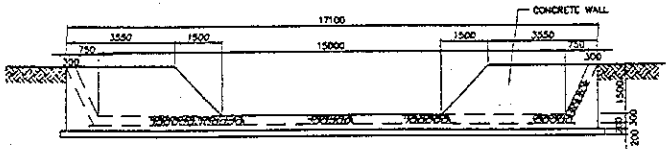
SECTION A–A
SCALE 1:100



PLAN
DETAIL OF PILE SCREEN
SCALE 1:100



SECTION A–A
SCALE 1:150



SECTION B–B
SCALE 1:150

	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DETAILED DESIGN ON PORT REACTIVATION PROJECT IN LA UNION PROVINCE OF THE REPUBLIC OF EL SALVADOR	DESIGNED BY :	SECTION : STORM DRAINAGE	DATE : JULY/2002
	COMISION EJECUTIVA PORTUARIA AUTONOMA "CEPA"	NIPPON KOEI CO., LTD.	CHECKED BY :	SUB-SECTION : PROFILE AND DETAILS	SCALE : INDICATED
			APPROVED BY	TITLE : DIVERSION DRAINAGE (2/2)	DRAWING NO. DW-SI-01-023

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Catch basin	Calc. Index No.	
Subject	Excavation and Disposal	Page No.	Rev.

References/ Notes

$A = (16.55 + 18.55) \times 2.0 \div 2$

$= 35.1\ m^2$

Width 17.5 m

$V = 35.1 \times 17.5 = 614.25$

$\approx \boxed{615}\ m^3$

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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	Catch basin	**Pay Item No. (BOQ)**	2H-060602
Quantity Item	Compaction	**Unit**	m^2

Calculation Procedure Applied

Area of compaction for catch basin was computed on the drawing.

References, Calculation Base and Revisions

See the item of excavation and disposal of catch basin. (2H-0606)

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

References/ Notes

bottom.

$16.55 \times 17.5 = 289.625\ m^2$

side

$(17.5 \times 2 + 16.55 \times 2 - 2.0 - 5.0 - 2.0) \times 2$

$= 108.2\ m^2$

total $397.825 \rightarrow \boxed{398}\ m^2$

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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	Catch basin	**Pay Item No. (BOQ)**	2H-060603
Quantity Item	Clay	**Unit**	m^3

Calculation Procedure Applied

Volume of clay for catch basin was computed by multiplying compaction area by thickness.

References, Calculation Base and Revisions

See the item of excavation and disposal of catch basin. (2H-0606)

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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Catch basin	Calc. Index No.	
Subject	Clay	Page No.	Rev.

References/ Notes

Compaction area : 398 m²

Clay t = 5 cm.

V = 398 × 0.05 = 19.9 m³

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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	Catch Basin	**Pay Item No. (BOQ)**	2H-060604
Quantity Item	Rubble	**Unit**	m^3

Calculation Procedure Applied

Volume of rubble for catch basin was computed on the drawing.

References, Calculation Base and Revisions

See the item of excavation and disposal of catch basin. (2H-0606)

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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Catch basin	Calc. Index No.	
Subject	Rubble	Page No.	Rev.

References/ Notes

$V = 16.55 \times 17.5 \times 0.2$

$= 57.925$

$\simeq \boxed{58.0}\ m^3$

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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	Catch basin	**Pay Item No. (BOQ)**	2H-060605
Quantity Item	Masonry cement	**Unit**	m^3

Calculation Procedure Applied

Volume of masonry cement for catch basin was computed by multiplying compaction area by thickness.

References, Calculation Base and Revisions

See the item of excavation and disposal of catch basin. (2H-0606)

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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Catch basin	Calc. Index No.	
Subject	Masonry cement	Page No.	Rev.

References/ Notes

Compaction area 398 m²

Thickness 30cm.

$V = 398 \times 0.3 = \boxed{120}$ m³

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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	Catch basin	Pay Item No. (BOQ)	2H - 050606
Quantity Item	H shaped steel	Unit	kg

Calculation Procedure Applied

Weight of H shaped steel was computed on the drawing.

References. Calculation Basc and Revisions

See the item of excavation and disposal of catch basin.

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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Catch basin	Calc. Index No.	
Subject	H shaped steel	Page No.	Rev.

References/ Notes

H 300×300 L = 2m × 5

unit weight 97.4 kg/m

W = 97.4 × 2 × 5

= 974 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	Diversion canal type B	Pay Item No. (BOQ)	24-0701
Quantity Item	Excavation and Disposal	Unit	m^3

Calculation Procedure Applied

Volume of excavation was computed by multiplying section area by length.

References, Calculation Base and Revisions

DW-S1-01-022

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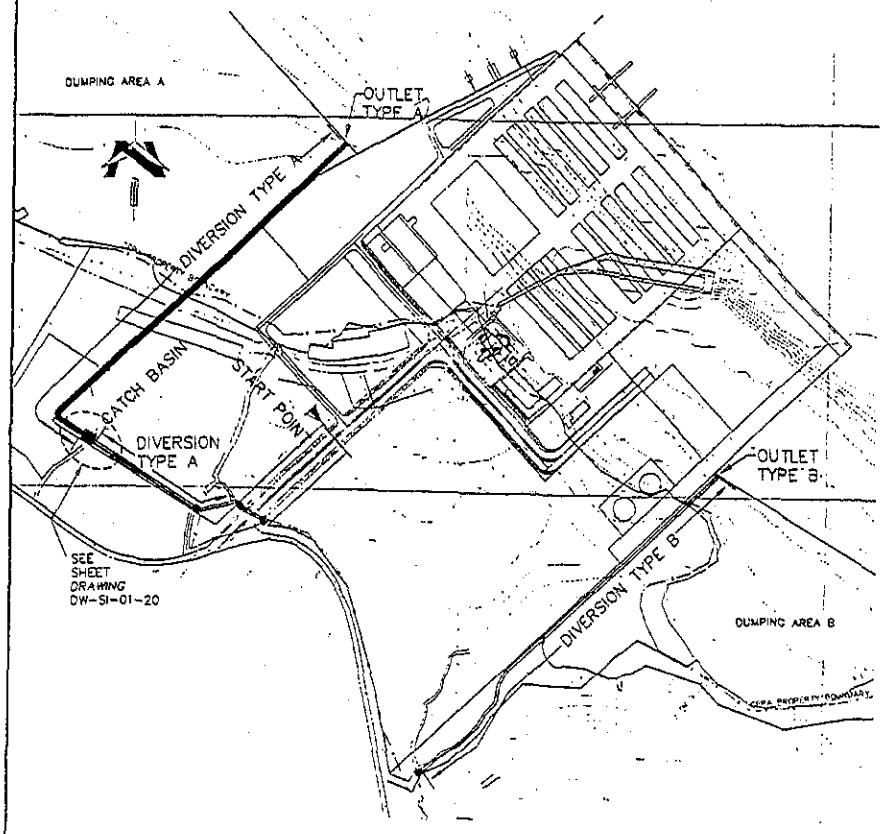
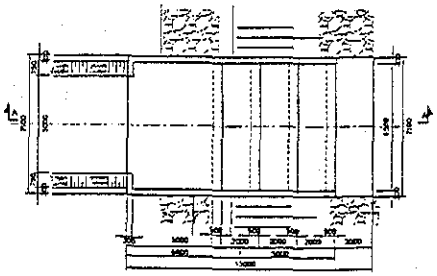
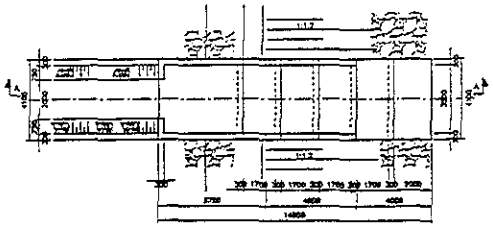


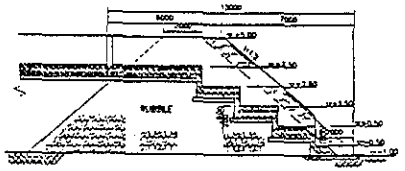
PLAN OF DIVERSION DRAINAGE
SCALE 1:6,500



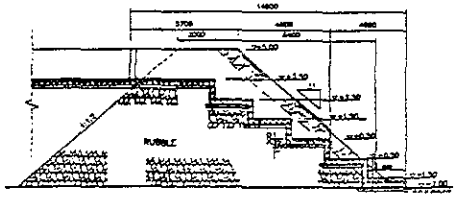
PLAN OUTLET TYPE B
SCALE 1:250



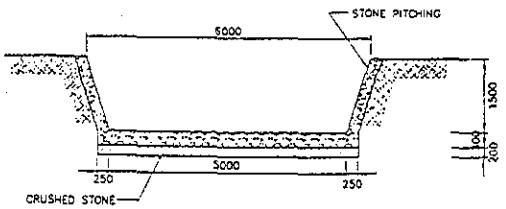
PLAN OUTLET TYPE A
SCALE 1:250



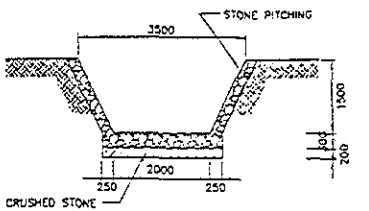
SECTION A–A OUTLET TYPE B
SCALE 1:250



SECTION A–A OUTLET TYPE A
SCALE 1:250



DIVERSION TYPE A
SCALE 1:100



DIVERSION TYPE A–1
& TYPE B
SCALE 1:100

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 : STORM DRAINAGE
SUB-SECTION : PROFILE AND DETAILS
TITLE : DIVERSION DRAINAGE (1/2)

DATE : JULY/2002
SCALE : INDICATED
DRAWING NO :

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Diversion canal type B	Calc. Index No.	
Subject	Excavation and Disposal	Page No.	Rev.

References/ Notes

$A = (4.0 + 2.5) \times 1.5 \div 2 + 0.5 \times 2.5$

$= 6.13\ m^3$

$L = 695\ m$

$V = 6.13 \times 695 = 4188$

$\fallingdotseq \boxed{4200}\ m^3$

	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	Diversion canal type B	Pay Item No. (BOQ)	2H-070201
Quantity Item	Compaction	Unit	m^2

Calculation Procedure Applied

Area of compaction was computed by multiplying section length by length.

References, Calculation Base and Revisions

See the item of excavation and disposal.
(2H-0701)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Kaka Gonia			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	Diversion canal type B	Calc. Index No.	
Subject	Compaction	Page No.	Rev.

References/ Notes

$$\ell = 1.68 \times 2 + 2.0 = 5.36\ m$$

$$L = 675\ m$$

$$A = 5.36 \times 675 = 3618$$

$$\approx \boxed{3700\ m^2}$$

	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	Diversion canal type B	Pay Item No. (BOQ)	2H-070202
Quantity Item	Clay	Unit	m^3

Calculation Procedure Applied

Volume of clay was computed by multiplying compaction area by thickness.

References, Calculation Base and Revisions

See the Item of excavation and disposal.
(2H-0701)

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	Diversion canal type B	Calc. Index No.	
Subject	Clay	Page No.	Rev.

References/ Notes

Compaction area 3700 m^2

Clay $t = 5$ cm

$V = 3700 \times 0.05 = \boxed{185}\ m^3$

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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	Diversion canal type B	**Pay Item No. (BOQ)**	2H-070203
Quantity Item	Rubble	**Unit**	m^3

Calculation Procedure Applied

Volume of rubble was computed by mutiplying section area by length.

References, Calculation Base and Revisions

See the item of excavation and disposal. (2H-0701)

Rev	Prepared by	Prepared Date	No. of Pages	Checked by	Checked Date	Reviewed by	Reviewed Date	Superseded by Calc No.
0	Karla Gorio			Mr. Inuma		Mr. Ando		
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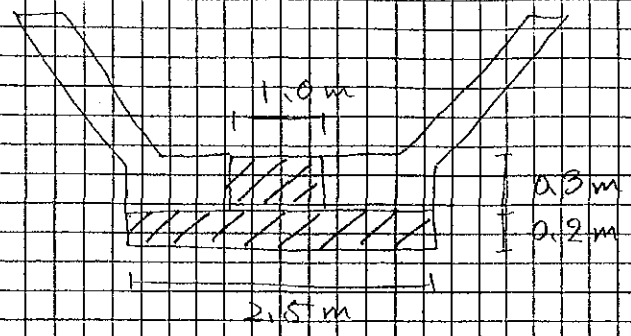
Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Diversion canal type B	Calc. Index No.	
Subject	Rubble	Page No.	Rev.

References/ Notes



$A = 1.0 \times 0.3 + 2.5 \times 0.2 = 0.8\ m^2$

$L = 695\ m$

$V = 0.8 \times 695 = \boxed{540}\ m^3$

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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	Diversion canal type B	Pay Item No. (BOQ)	2H-070204
Quantity Item	Masonry cement	Unit	m^3

Calculation Procedure Applied

Volume of masonry cement was computed by multiplying Section area by length.

References, Calculation Base and Revisions

See the item of excavation and disposal. (2H-0701)

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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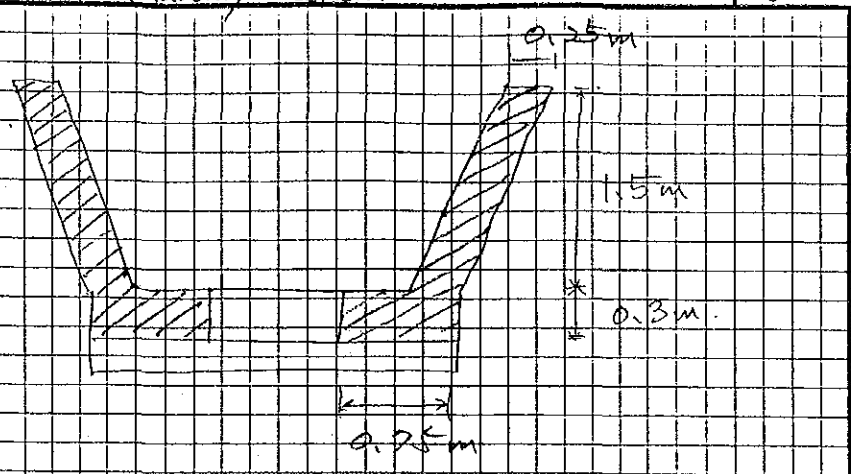
Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Diversion canal type B	Calc. Index No.	
Subject	Masonry cement	Page No.	Rev.

References/ Notes



$$A = (0.75 \times 0.3 + 0.25 \times 1.5) \times 2$$

$$= 1.2\ m^2$$

$$L = 6.75\ m$$

$$V = 1.2 \times 6.75 = \boxed{8.10}\ m^3$$

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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	Outlet type B	**Pay Item No. (BOQ)**	2H-070301
Quantity Item	Excavation and Disposal	**Unit**	m^3

Calculation Procedure Applied

Volume of excavation for outlet type B was computed by multiplying section area by width.

References, Calculation Base and Revisions

See the item of excavation and disposal. (2H-0701)

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	Outlet type B	Calc. Index No.	
Subject	Excavation and Disposal	Page No.	Rev.

References/ Notes

$(7.9 + 3.1) \times 2.0 \div 2 = 11.0\ m^2$

$(5.0 + 3.8) \times 1.0 \div 2 = 4.4\ m^2$

$(4.2 + 3.0) \times 1.0 \div 2 = 3.6\ m^2$

$(3.3 + 2.2) \times 1.0 \div 2 = 2.75\ m^2$

$(2.6 + 1.4) \times 1.0 \div 2 = 2.0\ m^2$

$(1.7 + 0.6) \times 1.0 \div 2 = 1.15\ m^2$

$3 \times 0.2 = 0.6\ m^2$

$25.5\ m^2$

$V = 25.5 \times 4.1 = 104.55$

$\fallingdotseq \boxed{105}\ m^3$

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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	Outlet type B	**Pay Item No. (BOQ)**	2H-070302
Quantity Item	Compaction	**Unit**	m^2

Calculation Procedure Applied

Area of compaction for outlet type B was computed by multiplying compaction length by width.

References, Calculation Base and Revisions

See the item of excavation and disposal. (2H-0701)

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	Outlet type B	Calc. Index No.	
Subject	Compaction	Page No.	Rev.

References/ Notes

side 25.5 × 2 = 51.0 m²

bottom 19.0 × 4.1 = 77.9 m²

108.9 m²

≈ 109 m²

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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	Outlet type B	Pay Item No. (BOQ)	2H-070303
Quantity Item	Clay	Unit	m^3

Calculation Procedure Applied

Volume of clay for outlet type B was computed by multiplying compaction area by thickness.

References, Calculation Base and Revisions

See the item of excavation and disposal. (2H-0701)

Rev	Prepared by	Prepared Date	No. of Pages	Checked by	Checked Date	Reviewed by	Reviewed Date	Superseded by Calc No.
0	Karla Garcia			Mr. Tsuma		Mr. Ando		
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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Outlet type B	Calc. Index No.	
Subject	Clay	Page No.	Rev.

References/ Notes

Compaction area 109 m^2

Clay $t = 5$ cm

$V = 109 \times 0.05 = 5.45$

$\simeq 5.5$ 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	Outlet type B	**Pay Item No. (BOQ)**	2H-070304
Quantity Item	Rubble	**Unit**	m^3

Calculation Procedure Applied

Volume of rubble for outlet type B was computed by multiplying section area by width.

References, Calculation Base and Revisions

See the item of excavation and disposal. (2H-0701)

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	Outlet type B	Calc. Index No.	
Subject	Rubble	Page No.	Rev.

References/ Notes

$A = (4.2 + 2.2 + 3.2 + 2.2 + 2.2 + 3.0) \times 0.2$

$= 3.2\ m^2$

Width 3.5 m

$V = 3.2 \times 3.5 = \boxed{11.2}\ m^3$

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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	Outlet type B	**Pay Item No. (BOQ)**	2H-07○3○5
Quantity Item	Masonry cement	**Unit**	m^3

Calculation Procedure Applied

Volume of masonry cement was computed by multiplying section area by width.

References, Calculation Base and Revisions

See the item of excavation and disposal.
(2H-0701)

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	Outlet type B	Calc. Index No.	
Subject	Masonry cement	Page No.	Rev.

References/ Notes

Side

$(8.1 + 5.7) \times 2.0 \div 2 = 13.8\ m^2$

$(5.1 + 3.9) \times 1.0 \div 2 = 4.5\ m^2$

$(4.3 + 3.1) \times 1.0 \div 2 = 3.7\ m^2$

$2.3 \times 1.0 = 2.3\ m^2$

$24.3\ m^2$

$V_1 = 24.3 \times 0.3 \times 2 = 14.58\ m^3$

bottom

$V_2 = (4.2 + 2.0 \times 3 + 1.0 \times 4) \times 0.3 \times 3.5$
$+ (2.0 + 1.0) \times 0.3 \times 4.1 + 2.3 \times 0.5 \times 4.1$
$= 23.315\ m^3$

$V = V_1 + V_2 = 37.895$

$\fallingdotseq [37.9]\ m^3$

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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	U type ditch (B)	**Pay Item No. (BOQ)**	2H-070401
Quantity Item	Excavation and Disposal	**Unit**	m³

Calculation Procedure Applied

Excavation volume for U type ditch was computed by multiplying sectional area by the length.

References. Calculation Base and Revisions

DW-SD-01-020

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
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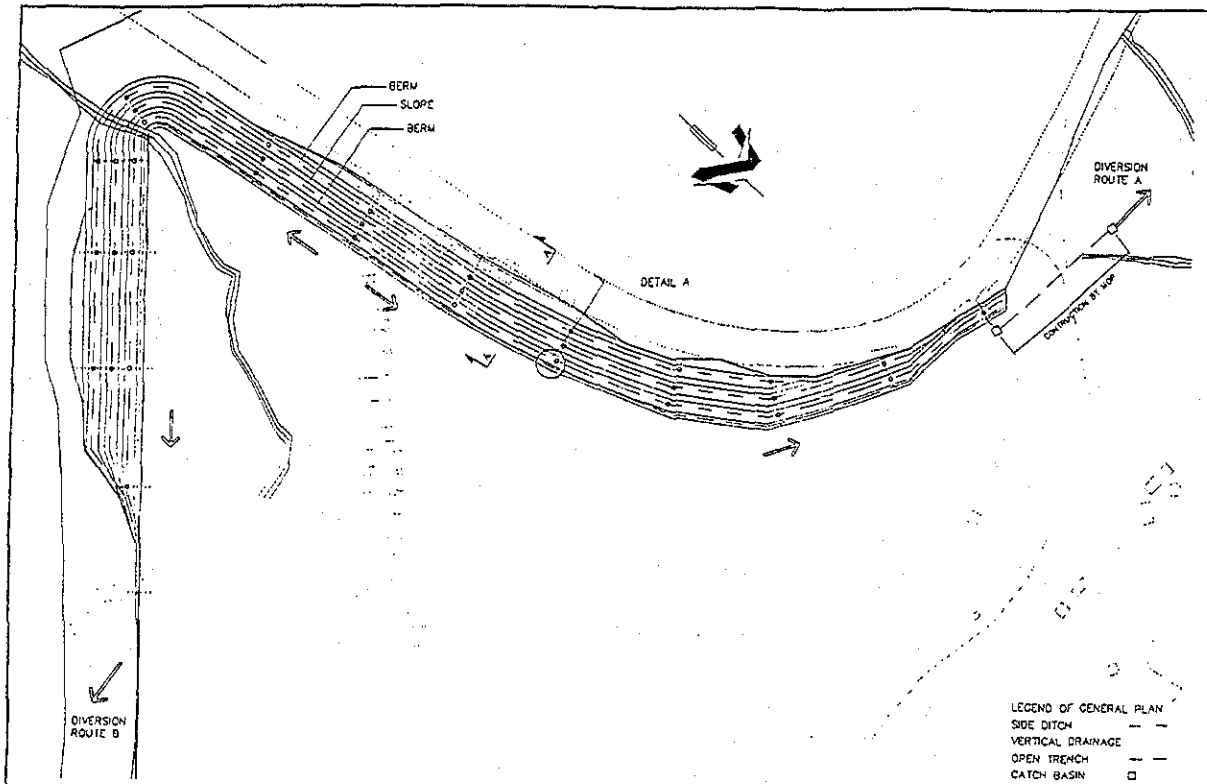
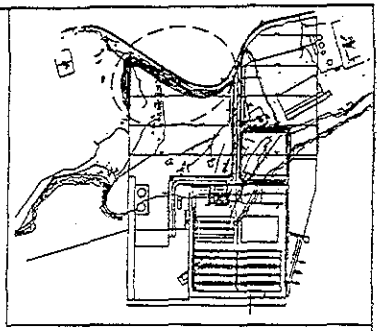
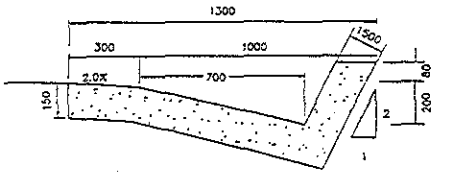


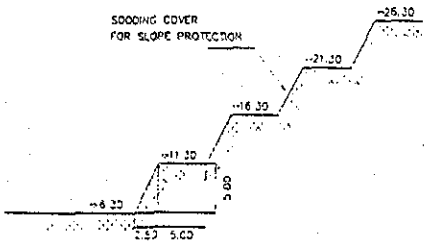
GENERAL PLAN
SCALE 1:2000



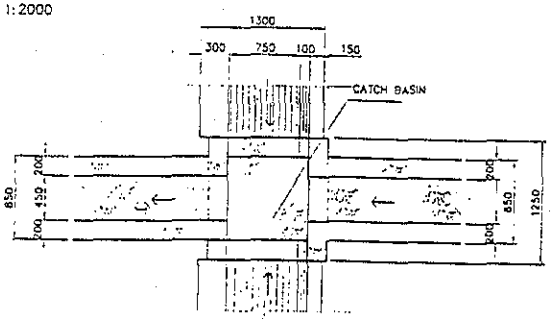
KEY PLAN



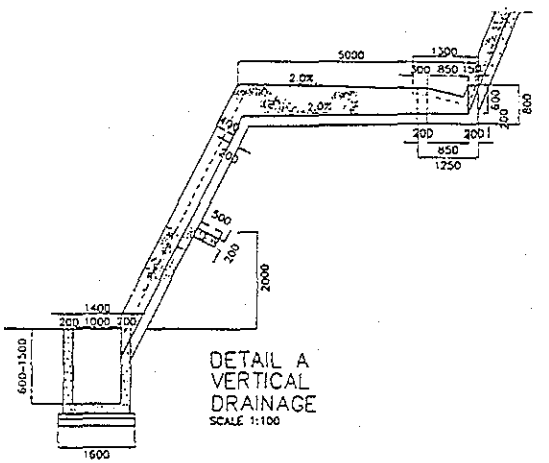
CONCRETE SIDE DITCH
SCALE 1:20



SECTION A-A
GENERAL PROFILE OF SLOPE
SCALE 1:50



DETAIL A
PLAN OF VERTICAL DRAINAGE
SCALE 1:50

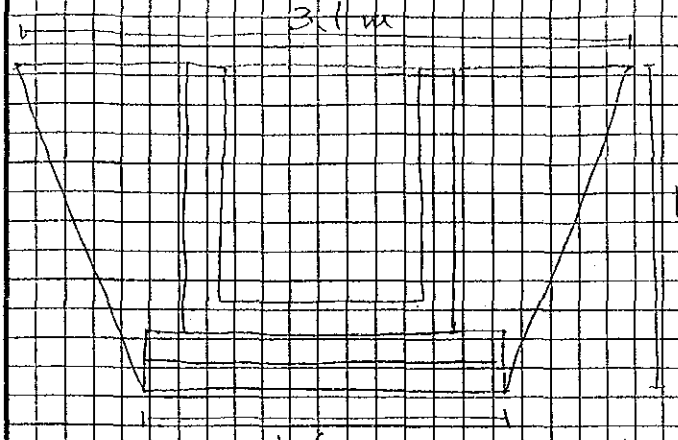


DETAIL A
VERTICAL DRAINAGE
SCALE 1:100

JICA	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DETAILED DESIGN ON PORT REACTIVATION PROJECT IN LA UNION PROVINCE OF THE REPUBLIC OF EL SALVADOR	DESIGNED BY	SECTION: STORM DRAINAGE	DATE: JULY/2002
CEPA	COMISION EJECUTIVA PORTUARIA AUTONOMA (CEPA)	NIPPON KOEI CO., LTD.	CHECKED BY	SUB-SECTION: PROFILE AND DETAILS	SCALE: INDICATED
			APPROVED BY	TITLE: SLOPE DRAINAGE	DRAWING NO.

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	U type ditch (B)	Calc. Index No.	
Subject	Excavation and Disposal	Page No.	Rev.

References/ Notes



$$A = (1.6 + 3.1) \times 1.5 \div 2$$
$$= 3.525$$
$$\fallingdotseq 3.53\ m^2$$

$$L = 365\ m$$

$$V = 3.53 \times 365 = 1288.5$$
$$\fallingdotseq \boxed{1290\ m^3}$$

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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	U type ditch (B)	**Pay Item No. (BOQ)**	2H-070402
Quantity Item	Compaction	**Unit**	m^2

Calculation Procedure Applied

Compaction area for U type ditch was computed by multiplying width by length.

References, Calculation Base and Revisions

See the item of excavation and disposal of U type ditch. (2H-0704)

Rev	Prepared by	Prepared Date	No. of Pages	Checked by	Checked Date	Reviewed by	Reviewed Date	Superseded by Calc No.
0	Karla Garcia			Mr. Touma		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	U type ditch (B)	Calc. Index No.	
Subject	Compaction	Page No.	Rev.

References/ Notes

$A = 1.6 \times 365 = [584]\ m^2$

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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	U type ditch (B)	**Pay Item No. (BOQ)**	2H-070403
Quantity Item	Crushed stone	**Unit**	m^3

Calculation Procedure Applied

Volume of crushed stone was computed by multiplying sectional area by the length.

References. Calculation Base and Revisions

See the item of excavation and disposal of U type ditch. (2H-0704)

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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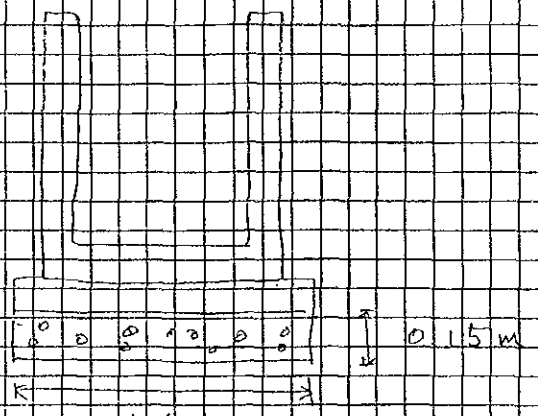
Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	U type ditch (B)	Calc. Index No.	
Subject	Crushed stone	Page No.	Rev.

References/ Notes



$V = 0.15 \times 1.6 \times 365$

$= \boxed{87.6}\ m^3$

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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	U type ditch (B)	**Pay Item No. (BOQ)**	2H - 0704.04
Quantity Item	Lean concrete	**Unit**	m^3

Calculation Procedure Applied

Volume of lean concrete was computed by multiplying sectional area by the length.

References, Calculation Base and Revisions

See the item of excavation and disposal of U type ditch. (2H- 0704)

Rev	Prepared by	Prepared Date	No. of Pages	Checked by	Checked Date	Reviewed by	Reviewed Date	Superseded by Calc No.
0	Karla Garcia			Mr. Tsuma		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	U type ditch (B)	Calc. Index No.	
Subject	Lean concrete	Page No.	Rev.

References/ Notes

$V = 1.6 \times 0.1 \times 365$

$= \boxed{58.4}\ m^3$

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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	U type ditch (B)	**Pay Item No. (BOQ)**	2H-070405
Quantity Item	Form	**Unit**	m^2

Calculation Procedure Applied

Area of form for U type ditch was computed by multiplying sectional length by the length.

References, Calculation Base and Revisions

See the item of excavation and disposal of U type ditch. (2H-0704)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
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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	U type ditch	Calc. Index No.	
Subject	Form	Page No.	Rev.

References/ Notes

$$A = (1.25 \times 2 + 1.05 \times 2) \times 365$$

$$= 1679$$

$$= \boxed{1680}\ m^2$$

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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	U type ditch (B)	**Pay Item No. (BOQ)**	2H-070406
Quantity Item	Reinforcement	**Unit**	kg

Calculation Procedure Applied

Weight of reinforcement was computed by multiplying unit weight by the length.

References, Calculation Base and Revisions

See the item of excavation and disposal of U type ditch. (2H-0704)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Garcia			Mr. Inuma		Mr. Ando		
1								
2								
3								

FN : Calculation_Cover_Sheet_020504_seg cover

TABLE OF REINFORCEMENT (DIVERSION)

No.	D	L (m)	Qty	W/bar (kg)	W (kg)	Remarks
Diversion (per 1m)						
A1	D13	3.20	5	3.184	15.92	
A2	D13	1.00	17	0.995	16.92	
				total/m	32.84	
			L=270m	total	8,870	
			L=365m	total	11,990	

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	U type ditch (B)	**Pay Item No. (BOQ)**	2H-070407
Quantity Item	Concrete	**Unit**	m^3

Calculation Procedure Applied

Concrete volume was computed by multiplying sectional area by the length.

References, Calculation Base and Revisions

See the item of excavation and disposal of U type ditch. (2H-0704)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Garcia			Mr. Inoma		Mr. Ando		
1								
2								
3								

FN : Calculation_Cover_Sheet_020504_seg cover

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	U type ditch (B)	Calc. Index No.	
Subject	Concrete	Page No.	Rev.

References/ Notes

$A = 1.05 \times 0.2 \times 2 + 1.4 \times 0.2$

$= 0.7\ m^2$

$V = 0.7 \times 365 = 255.5$

$\approx \boxed{256}\ m^3$

	Prepared by		Checked by	
		/ /200		/ /200

FN: Calculation_Sheet