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-070408
Quantity Item	Elas tigh board	Unit	m²

Calculation Procedure Applied

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

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Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.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	
O	Koila Goruo			Mr. Jnuma		Mr. Ando		
1								
2								
3								

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

$$N = 368 \div 10 = 37$$

$$A_1 = 1.05 \times 0.7 \times 2 + 1.4 \times 0.2$$

$$= 0.7 \ m^2$$

$$A_T = 0.7 \times 37 = \boxed{25.9} \ m^2$$

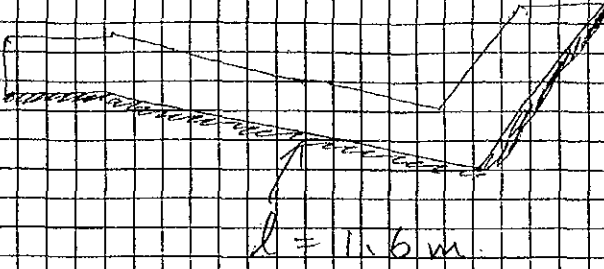|		Prepared by			Checked by		
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QUANTITY CALCULATION COVER SHEET

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-070409
Quantity Item	Backfill	Unit	m³

Calculation Procedure Applied

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

References, Calculation Base and Revisions

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

Rev	Prepared by	Date	No. of Pages	Checked by	Date	Reviewed by	Date	Superseded by Calc No.
0	Kaila Garcia			Mr. Jruma		Hr. Ando		
1								
2								
3								

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

References/Notes

Excavation   1290 m³

Crushed stone   87.6 m³

Lean concrete   58.4 m³

U type ditch

$V = 1.25 \times 1.4 \times 365 = 639$ m³

Backfill

$V = 1290 - 87.6 - 58.4 - 639$

$= \boxed{505}$ m³

Prepared by				Checked by			
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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 (B)	Pay Item No. (BOQ)	2H-070410
Quantity Item	Compaction	Unit	m²

Calculation Procedure Applied

Compaction area was computed by 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.
	by	Date		by	Date	by	Date	
0	Kola Goruo			Hr. Truma		Hr. Ando		
1								
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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Plate type ditch (B)	Calc. Index No.	
Subject	Compaction	Page No.	Rev.

References/Notes

$l = 1.6 \, m$

$A = 1.6 \times 1058 = 1693$

$= \boxed{1700} \, m^2$

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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 (B)	Pay Item No. (BOQ)	2H-070411
Quantity Item	Concrete	Unit	m³

Calculation Procedure Applied

Concrete volume 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 O type ditch. (2H - 0704)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
O	Korla Gonio			Mr. Jnuma		Mr. Ando		
1								
2								
3								

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

$$\ell = 1.45 m$$

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

$$L = 10.58 m$$

$$V = 0.22 \times 10.58 = 2.32.8$$

$$\approx \boxed{2.33} \ m^3$$

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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 (B)	Pay Item No. (BOQ)	2H -0704/2
Quantity Item	Excavation and Disposal	Unit	m³

Calculation Procedure Applied

Excavation volume 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 - 0704)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Hala Gonza			Mr. Touma		Mr. Ando		
1								
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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Vertical drainage (B)	Calc. Index No.	
Subject	Excavation and Disposal	Page No.	Rev.

References/Notes

$V/1$ spot

$V_1 = 1.67 + 4.8 + 2.04$

$= 8.51 \ m^3$

$N = 16$

$V = 8.51 \times 16 = 136.2$

$= \boxed{137} \ m^3$

Prepared by

Checked by

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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 (5)	Pay Item No. (BOQ)	2H-070413
Quantity Item	Compaction	Unit	m²

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 U type ditch. (2H - 0704)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
O	Koala Gorao			Mr. Inuma		Mr. Ando		
1								
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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Vertical drainage (B)	Calc. Index No.	
Subject	Compaction	Page No.	Rev.

Area/1 spot

$A_1 = 1.56 + 4.25 + 7.90$

$= 13.71 \, m^2$

$N = 16$

$A = 13.71 \times 16 = 219.4$

$\simeq \boxed{220} \, m^2$

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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 (B)	Pay Item No. (BOQ)	2H-070414
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- 0704)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Koila Gorgo			Mr. Inuma		Mr. Ando		
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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Vertical drainage (B)	Calc. Index No.	
Subject	Form	Page No.	Rev.

References/
Notes

Area / 1 spot

$A_1 = 6.04 + 13.5 + 11.0$

$= 30.54 \ m^2$

$N = 16$

$A = 30.54 \times 16 = 488.7$

$\approx \boxed{489} \ m^2$

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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 (B)	Pay Item No. (BOQ)	2H - 070415
Quantity Item	Concrete	Unit	m³

Calculation Procedure Applied

Concrete 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 - 0704)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
O	Kaila Goida			Mr. Iouma		Mr. Ando		
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3								

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

References/
Notes

Volume / 1 spet

$V_1 = 0.57 + 2.0 + 1.82$

$= 4.49 \ m^3$

$N = 16$

$V = 4.49 \times 16 = 71.84$

$= \boxed{71.9} \ m^3$

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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	Vertical drainage (B)	Pay Item No. (BOQ)	2H-070416
Quantity Item	Backfill	Unit	m³

Calculation Procedure Applied

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

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	Kaila Garcia			Mr. Inoma		Mr. Ando		
1								
2								
3								

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

References/Notes

Volume / 1 spot

$V_1 = 0.45 + 1.50 + 0.44$

$= 2.39 \ m^3$

$N = 16$

$V = 2.39 \times 16 = 38.24$

$= \boxed{38.3} \ m^3$

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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	Manhole 1200 mm	Pay Item No. (BOQ)	2H-0801
Quantity Item	Excavation and Disposal	Unit	m³

Calculation Procedure Applied

1. Calculation of depth of manhole

2. Calculation of volume of excavation (Excel)

References, Calculation Base and Revisions

DW-SD-00-001

DW-SD-01-009

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Kaila García			Mr. Jauma		Mr. Ando		
1								
2								
3								

START POINT

LEGEND:
OM—O : MANHOLE NAME
OP—O : PIPE LINE NAME

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DETAILED DESIGN ON PORT REACTIVATION PROJECT IN LA UNION PROVINCE OF THE REPUBLIC OF EL SALVADOR
COMISION EJECUTIVA PORTUARIA AUTONOMA (CEPA)	NIPPON KOEI CO., LTD.

SECTION : STORM DRAINAGE
SUB-SECTION : GENERAL
TITLE : LAYOUT OF PIPE CULVERT & MANHOLE

DATE : JULY/2002
SCALE : 1 : 3,000

STEEL GRATING COVER OR CONCRETE COVER

R.C. TRENCH

150 1200 150
100
SEE DETAIL (A)
GROUND ELEVATION

FLOW

300

H

CRUSHED ROCK

C   C

BOTTOM ELEVATION

LEAN CONCRETE

CRUSHED ROCK

200 1200 200
150   150

CONCRETE

SECTION (A)-(A)
SCALE 1:50

1500
650   650
1200

D9
L=650

D13 Φ 150
D13 Φ 150
D13 Φ 150
D13 Φ 150

D13 Φ 150

400   400

D13 Φ 100   D13 Φ 400
D13 Φ 400   D13 Φ 100

REINFORCEMENT

D16MM
L=1450

1200
SEE DETAIL (A)

D25
L=1450

D13

D13

400

013 Φ100   D13 Φ400
013 Φ400   D13 Φ100

SECTION (B)-(B)
SCALE 1:50

2L50X50X6
150
50   100

100

D9X100G300
ANCHORAGE BAR

DETAIL (A)
SCALE 1:10

1280   D13 Φ 100

425   Φ25

40

20X40mm
LIFTING HOLES   D13 Φ 200
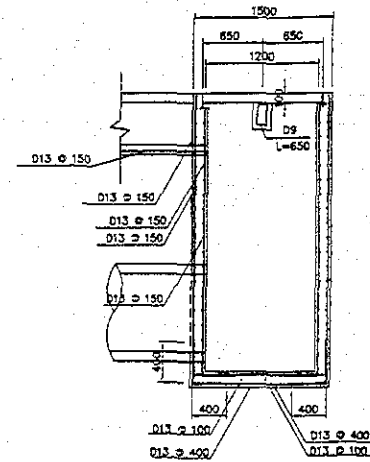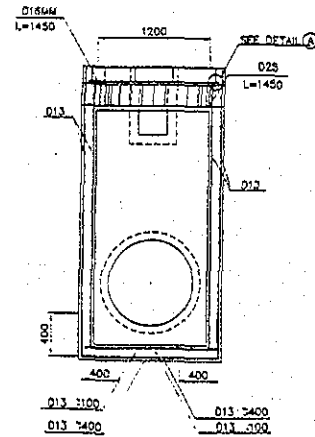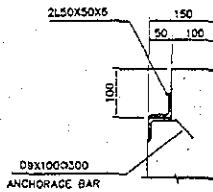
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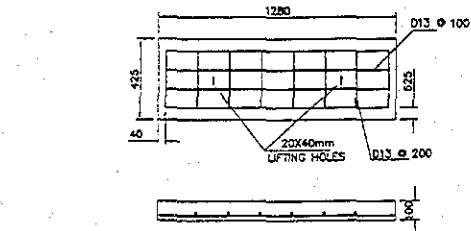
DETAILS OF CONCRETE COVER FOR MANHOLE
SCALE 1:25

1294   50   50

645   12x50mm

12x50mm
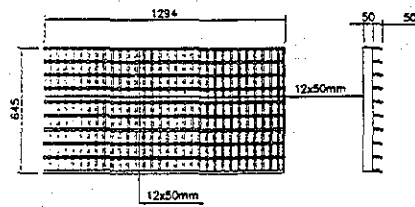
DETAILS OF STEEL GRATING COVER FOR MANHOLE
SCALE 1:25

234

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Manhole 1200 mm	Calc. Index No.	
Subject	Excavation and Disposal	Page No.	Rev.

References/Notes

$$V = \frac{1}{3} \times (a+h)^3 - \frac{1}{3} a^3$$

$$= \frac{1}{3}(3a^2h + 3ah^2 + h^3)$$

$$= a^2h + ah^2 + \frac{h^3}{3}$$

	Prepared by		Checked by		
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Concrete cover

		W (m)	a (m)	G.L (m)	B.L (m)	h (m)	Vex (m3)	Vcs (m3)	Vlo (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-1	1.2	1.9	5.522	2.444	3.478	49.6	0.55	0.37	42.4	26.7	38.47	846	3.16
2	CM-1	1.2	1.9	5.562	3.399	2.563	27.4	0.55	0.37	21.9	17.7	28.59	623	2.42
3	CM-2	1.2	1.9	5.537	3.343	2.594	28	0.55	0.37	22.4	18	28.92	631	2.44
4	CM-3	1.2	1.9	5.437	3.303	2.534	26.8	0.55	0.37	21.3	17.5	28.27	616	2.4
5	CM-4	1.2	1.9	5.437	3.229	2.608	28.3	0.55	0.37	22.7	18.1	29.07	634	2.45
6	CM-4-1	1.2	1.9	5.537	3.269	2.668	29.5	0.55	0.37	23.8	18.7	29.72	649	2.5
7	CM-5	1.2	1.9	5.637	3.189	2.848	33.4	0.55	0.37	27.3	20.3	31.66	693	2.65
8	CM-5-1	1.2	1.9	5.637	3.205	2.832	33.1	0.55	0.37	27.1	20.2	31.49	689	2.64
9	CM-6	1.2	1.9	5.637	3.055	2.982	36.5	0.55	0.37	30.2	21.6	33.11	725	2.70
10	CM-7	1.2	1.9	5.857	2.691	3.566	52.2	0.55	0.37	44.8	27.7	39.42	867	3.23
11	CM8-1	1.2	1.9	5.507	2.755	3.152	40.7	0.55	0.37	34.1	23.3	34.95	766	2.9
12	CM8-1-1	1.2	1.9	5.592	2.819	3.173	41.3	0.55	0.37	34.6	23.5	35.17	772	2.91
13	CM-8-2	1.2	1.9	5.507	2.795	3.112	39.7	0.55	0.37	33.2	22.9	34.51	757	2.86
14	CM-8-2-1	1.2	1.9	5.602	2.821	3.181	41.5	0.55	0.37	34.8	23.6	35.26	773	2.92
15	CM-8-3	1.2	1.9	5.507	2.258	3.649	54.7	0.55	0.37	47.2	28.6	40.31	887	3.3
16	CM-8-4	1.2	1.9	5.507	2.895	3.012	37.3	0.55	0.37	30.9	21.9	33.43	732	2.78
17	DM-1	1.2	1.9	6.26	4.797	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
18	DM-2	1.2	1.9	5.5	3.147	2.753	31.3	0.55	0.37	25.4	19.5	30.64	669	2.57
19	DM-3	1.2	1.9	5.2	3.045	2.555	27.2	0.55	0.37	21.7	17.6	28.5	621	2.41
20	DM-4	1.2	1.9	5.34	3.125	2.615	28.4	0.55	0.37	22.8	18.2	29.15	636	2.46
21	DM-4-1	1.2	1.9	5.34	3.047	2.693	30.1	0.55	0.37	24.3	18.9	29.99	655	2.52
22	DM-5	1.2	1.9	5.34	2.865	2.875	34.1	0.55	0.37	28	20.6	31.95	699	2.67
23	DM-5-1	1.2	1.9	5.34	2.887	2.853	33.6	0.55	0.37	27.5	20.4	31.72	694	2.65
24	DM-7-1	1.2	1.9	5.17	2.683	2.887	34.3	0.55	0.37	28.2	20.7	32.08	702	2.68
25	DM-8-1	1.2	1.9	4.625	2.7	2.325	22.9	0.55	0.37	17.8	15.7	26.01	565	2.23
26	DM-9-1	1.2	1.9	5.01	2.546	2.864	33.8	0.55	0.37	27.7	20.5	31.84	696	2.66
27	DM-9-2	1.2	1.9	5.01	2.564	2.846	33.4	0.55	0.37	27.3	20.3	31.64	692	2.65
28	EM-1	1.2	1.9	6.06	3.897	2.563	27.4	0.55	0.37	21.9	17.7	28.59	623	2.42
29	EM-2	1.2	1.9	5.97	3.799	2.571	27.6	0.55	0.37	22	17.8	28.67	625	2.43
30	EM-2-1	1.2	1.9	5.97	3.808	2.562	27.4	0.55	0.37	21.9	17.7	28.57	623	2.42
31	EM-3	1.2	1.9	5.59	3.39	2.6	28.1	0.55	0.37	22.5	18	28.98	632	2.45
32	EM-4-2	1.2	1.9	5.43	3.972	1.858	15.5	0.55	0.37	11.2	11.9	20.97	452	1.85
33	EM-4-3	1.2	1.9	6.14	4.687	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
34	EM-4-4	1.2	1.9	6.25	4.797	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
	Total						1,090	18.7	12.6	883	662	1,040	22,600	87.0

Concrete cover

		W (m)	a (m)	G.L (m)	B.L (m)	h (m)	Vex (m3)	Vcs (m3)	Vlo (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-2	1.5	2.2	5.522	2.406	3.516	58.8	0.73	0.49	48.1	29.5	47.5	932	3.97
2	AM-3	1.5	2.2	5.332	2.328	3.404	55.2	0.73	0.49	44.8	28.2	46.02	903	3.86
3	AM-5-1	1.5	2.2	5.132	2.158	3.374	54.2	0.73	0.49	43.8	27.9	45.62	895	3.83
4	AM-6-1	1.5	2.2	4.928	1.982	3.346	53.4	0.73	0.49	43.1	27.6	45.25	887	3.8
5	AM-6-2	1.5	2.2	4.928	2.007	3.321	52.6	0.73	0.49	42.4	27.3	44.92	881	3.78
6	AM-7-1	1.5	2.2	4.711	1.797	3.314	52.4	0.73	0.49	42.2	27.2	44.83	879	3.77
7	BM-4	1.5	2.2	4.711	1.395	3.716	65.5	0.73	0.49	54.2	31.8	50.14	985	4.17
8	BM-5-1	1.5	2.2	4.711	1.373	3.738	66.3	0.73	0.49	55	32.1	50.43	991	4.19
9	CM-11-1	1.5	2.2	5.132	2.379	3.153	47.6	0.73	0.49	37.8	25.5	42.7	836	3.61
10	CM-12-1	1.5	2.2	4.928	2.247	3.081	45.6	0.73	0.49	36	24.7	41.75	817	3.54
11	CM-13-1	1.5	2.2	4.711	1.44	3.671	64	0.73	0.49	52.8	31.3	49.54	973	4.13
12	CM-8	1.5	2.2	5.507	2.62	3.287	51.6	0.73	0.49	41.5	26.9	44.47	872	3.75
13	CM-9	1.5	2.2	5.332	2.55	3.182	48.5	0.73	0.49	38.7	25.8	43.09	844	3.64
14	DM-10	1.5	2.2	4.844	2.084	3.16	47.8	0.73	0.49	38	25.5	42.8	838	3.62
15	DM-6	1.5	2.2	4.625	2.836	2.189	24.7	0.73	0.49	17.6	16.1	29.98	581	2.66
16	DM-7	1.5	2.2	5.17	2.665	2.905	40.8	0.73	0.49	31.7	22.9	39.43	770	3.37
17	DM-8	1.5	2.2	5.119	2.519	3	43.4	0.73	0.49	34.1	23.8	40.68	795	3.46
18	DM-9	1.5	2.2	5.019	2.739	2.68	35.2	0.73	0.49	26.7	20.6	36.46	711	3.14
19	EM-4	1.5	2.2	5.33	3.114	2.616	33.7	0.73	0.49	25.4	20	35.62	694	3.08
20	EM-4-1	1.5	2.2	5.33	3.306	2.424	29.5	0.73	0.49	21.7	18.2	33.08	643	2.89
21	EM-5	1.5	2.2	5.22	2.979	2.641	34.3	0.73	0.49	25.9	20.2	35.95	700	3.11
22	EM-5-1	1.5	2.2	5.22	3.001	2.619	33.8	0.73	0.49	25.5	20	35.66	695	3.08
23	EM-5-2	1.5	2.2	5.22	3.011	2.609	33.6	0.73	0.49	25.3	19.9	35.52	692	3.07
24	EM-6	1.5	2.2	4.89	2.669	2.621	33.9	0.73	0.49	25.6	20.1	35.68	695	3.09
	Total						1,110	17.6	11.8	880	600	1,000	19,800	85

Grating cover

		W (m)	a (m)	G.L (m)	B.L (m)	h (m)	Vex (m3)	Vcs (m3)	Vlo (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-4	1.5	2.2	5.332	2.28	3.452	56.7	0.73	0.49	46.1	28.8	46.65	915	3.91
2	AM-5	1.5	2.2	5.132	2.109	3.423	55.8	0.73	0.49	45.3	28.4	46.27	908	3.88
3	AM-6	1.5	2.2	4.928	1.934	3.394	54.9	0.73	0.49	44.5	28.1	45.89	900	3.85
4	BM-1	1.5	2.2	5.332	1.881	3.851	70.4	0.73	0.49	58.7	33.4	51.92	1021	4.3
5	BM-1-1	1.5	2.2	5.332	1.929	3.803	68.6	0.73	0.49	57.1	32.8	51.28	1008	4.26
6	BM-2	1.5	2.2	5.132	1.71	3.822	69.3	0.73	0.49	57.7	33.1	51.54	1013	4.27
7	BM-2-1	1.5	2.2	5.132	1.758	3.774	67.6	0.73	0.49	56.2	32.5	50.9	1001	4.23
8	BM-3	1.5	2.2	4.928	1.534	3.794	68.3	0.73	0.49	56.8	32.7	51.17	1006	4.25
9	BM-3-1	1.5	2.2	4.928	1.582	3.746	66.6	0.73	0.49	55.2	32.2	50.53	993	4.2
10	CM-10	1.5	2.2	5.332	2.502	3.23	49.9	0.73	0.49	39.9	26.3	43.72	856	3.69
11	CM-11	1.5	2.2	5.132	2.331	3.201	49	0.73	0.49	39.1	26	43.34	849	3.66
12	CM-12	1.5	2.2	4.928	2.199	3.129	46.9	0.73	0.49	37.2	25.2	42.39	830	3.59
	Total						730	8.8	5.9	600	360	576	11,300	49

To oil separator

		W (m)	a (m)	G.L (m)	B.L (m)	h (m)	Vex (m3)	Vcs (m3)	Vlo (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-7	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
2	BM-5	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
3	CM-13	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
4	DM-11	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
	Total						380	4.4	3.0	273	167	296	6,020	38

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Manhole 1200 mm	Pay Item No. (BOQ)	2H - 0802
Quantity Item	Crushed stone	Unit	m³

Calculation Procedure Applied

Volume of crushed stone was computed by multiplying area by thickness.

References, Calculation Base and Revisions

See the item of excavation and disposal of 1200mm.

(2H - 0801)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
O	Koila Gorda			Mr. Inuma		Mr. Ando		
1								
2								
3								

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Manhole 1200 mm	Calc. Index No.	
Subject	Crushed stone	Page No.	Rev.

References/Notes

0.2   0.2

0.15 m

a

$$V = 0.5 a^2$$

Prepared by		Checked by	
	/ /200		/ /200

FN: Calculation_Sheet

238

Concrete cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlc (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-1	1.2	1.9	5.522	2.444	3.478	49.6	0.55	0.37	42.4	26.7	38.47	846	3.16
2	CM-1	1.2	1.9	5.562	3.399	2.563	27.4	0.55	0.37	21.9	17.7	28.59	623	2.42
3	CM-2	1.2	1.9	5.537	3.343	2.594	28	0.55	0.37	22.4	18	28.92	631	2.44
4	CM-3	1.2	1.9	5.437	3.303	2.534	26.8	0.55	0.37	21.3	17.5	28.27	616	2.4
5	CM-4	1.2	1.9	5.437	3.229	2.608	28.3	0.55	0.37	22.7	18.1	29.07	634	2.45
6	CM-4-1	1.2	1.9	5.537	3.269	2.668	29.5	0.55	0.37	23.8	18.7	29.72	649	2.5
7	CM-5	1.2	1.9	5.637	3.189	2.848	33.4	0.55	0.37	27.3	20.3	31.66	693	2.65
8	CM-5-1	1.2	1.9	5.637	3.205	2.832	33.1	0.55	0.37	27.1	20.2	31.49	689	2.64
9	CM-6	1.2	1.9	5.637	3.055	2.982	36.5	0.55	0.37	30.2	21.6	33.11	725	2.76
10	CM-7	1.2	1.9	5.857	2.691	3.566	52.2	0.55	0.37	44.8	27.7	39.42	867	3.23
11	CM8-1	1.2	1.9	5.507	2.755	3.152	40.7	0.55	0.37	34.1	23.3	34.95	766	2.9
12	CM8-1-1	1.2	1.9	5.592	2.819	3.173	41.3	0.55	0.37	34.6	23.5	35.17	772	2.91
13	CM-8-2	1.2	1.9	5.507	2.795	3.112	39.7	0.55	0.37	33.2	22.9	34.51	757	2.86
14	CM-8-2-1	1.2	1.9	5.602	2.821	3.181	41.5	0.55	0.37	34.8	23.6	35.26	773	2.92
15	CM-8-3	1.2	1.9	5.507	2.258	3.649	54.7	0.55	0.37	47.2	28.6	40.31	887	3.3
16	CM-8-4	1.2	1.9	5.507	2.895	3.012	37.3	0.55	0.37	30.9	21.9	33.43	732	2.78
17	DM-1	1.2	1.9	6.25	4.797	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
18	DM-2	1.2	1.9	5.5	3.147	2.753	31.3	0.55	0.37	25.4	19.5	30.64	669	2.57
19	DM-3	1.2	1.9	5.2	3.045	2.555	27.2	0.55	0.37	21.7	17.6	28.5	621	2.41
20	DM-4	1.2	1.9	5.34	3.125	2.615	28.4	0.55	0.37	22.8	18.2	29.15	636	2.46
21	DM-4-1	1.2	1.9	5.34	3.047	2.693	30.1	0.55	0.37	24.3	18.9	29.99	655	2.52
22	DM-5	1.2	1.9	5.34	2.865	2.875	34.1	0.55	0.37	28	20.6	31.95	699	2.67
23	DM-5-1	1.2	1.9	5.34	2.887	2.853	33.6	0.55	0.37	27.5	20.4	31.72	694	2.65
24	DM-7-1	1.2	1.9	5.17	2.683	2.887	34.3	0.55	0.37	28.2	20.7	32.08	702	2.68
25	DM-8-1	1.2	1.9	4.625	2.7	2.325	22.9	0.55	0.37	17.8	15.7	26.01	565	2.23
26	DM-9-1	1.2	1.9	5.01	2.546	2.864	33.8	0.55	0.37	27.7	20.5	31.84	696	2.66
27	DM-9-2	1.2	1.9	5.01	2.564	2.846	33.4	0.55	0.37	27.3	20.3	31.64	692	2.65
28	EM-1	1.2	1.9	6.06	3.897	2.563	27.4	0.55	0.37	21.9	17.7	28.59	623	2.42
29	EM-2	1.2	1.9	5.97	3.799	2.571	27.6	0.55	0.37	22	17.8	28.67	625	2.43
30	EM-2-1	1.2	1.9	5.97	3.808	2.562	27.4	0.55	0.37	21.9	17.7	28.57	623	2.42
31	EM-3	1.2	1.9	5.59	3.39	2.6	28.1	0.55	0.37	22.5	18	28.98	632	2.45
32	EM-4-2	1.2	1.9	5.43	3.972	1.858	15.5	0.55	0.37	11.2	11.9	20.97	452	1.85
33	EM-4-3	1.2	1.9	6.14	4.687	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
34	EM-4-4	1.2	1.9	6.25	4.797	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
	Total						1,090	18.7	12.6	883	662	1,040	22,600	87.0

Concrete cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlc (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-2	1.5	2.2	5.522	2.406	3.516	58.8	0.73	0.49	48.1	29.5	47.5	932	3.97
2	AM-3	1.5	2.2	5.332	2.328	3.404	55.2	0.73	0.49	44.8	28.2	46.02	903	3.86
3	AM-5-1	1.5	2.2	5.132	2.158	3.374	54.2	0.73	0.49	43.8	27.9	45.62	895	3.83
4	AM-6-1	1.5	2.2	4.928	1.982	3.346	53.4	0.73	0.49	43.1	27.6	45.25	887	3.8
5	AM-6-2	1.5	2.2	4.928	2.007	3.321	52.6	0.73	0.49	42.4	27.3	44.92	881	3.78
6	AM-7-1	1.5	2.2	4.711	1.797	3.314	52.4	0.73	0.49	42.2	27.2	44.83	879	3.77
7	BM-4	1.5	2.2	4.711	1.395	3.716	65.5	0.73	0.49	54.2	31.8	50.14	985	4.17
8	BM-5-1	1.5	2.2	4.711	1.373	3.738	66.3	0.73	0.49	55	32.1	50.43	991	4.19
9	CM-11-1	1.5	2.2	5.132	2.379	3.153	47.6	0.73	0.49	37.8	25.5	42.7	836	3.61
10	CM-12-1	1.5	2.2	4.928	2.247	3.081	45.6	0.73	0.49	36	24.7	41.75	817	3.54
11	CM-13-1	1.5	2.2	4.711	1.44	3.671	64	0.73	0.49	52.8	31.3	49.54	973	4.13
12	CM-8	1.5	2.2	5.507	2.62	3.287	51.6	0.73	0.49	41.5	26.9	44.47	872	3.75
13	CM-9	1.5	2.2	5.332	2.55	3.182	48.5	0.73	0.49	38.7	25.8	43.09	844	3.64
14	DM-10	1.5	2.2	4.844	2.084	3.16	47.8	0.73	0.49	38	25.5	42.8	838	3.62
15	DM-6	1.5	2.2	4.625	2.836	2.189	24.7	0.73	0.49	17.6	16.1	29.98	581	2.66
16	DM-7	1.5	2.2	5.17	2.665	2.905	40.8	0.73	0.49	31.7	22.9	39.43	770	3.37
17	DM-8	1.5	2.2	5.119	2.519	3	43.4	0.73	0.49	34.1	23.8	40.68	795	3.46
18	DM-9	1.5	2.2	5.019	2.739	2.68	35.2	0.73	0.49	26.7	20.6	36.46	711	3.14
19	EM-4	1.5	2.2	5.33	3.114	2.616	33.7	0.73	0.49	25.4	20	35.62	694	3.08
20	EM-4-1	1.5	2.2	5.33	3.306	2.424	29.5	0.73	0.49	21.7	18.2	33.08	643	2.89
21	EM-5	1.5	2.2	5.22	2.979	2.641	34.3	0.73	0.49	25.9	20.2	35.95	700	3.11
22	EM-5-1	1.5	2.2	5.22	3.001	2.619	33.8	0.73	0.49	25.5	20	35.66	695	3.08
23	EM-5-2	1.5	2.2	5.22	3.011	2.609	33.6	0.73	0.49	25.3	19.9	35.52	692	3.07
24	EM-6	1.5	2.2	4.89	2.669	2.621	33.9	0.73	0.49	25.6	20.1	35.68	695	3.09
	Total						1,110	17.6	11.8	880	600	1,000	19,600	85

Grating cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlc (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-4	1.5	2.2	5.332	2.28	3.452	56.7	0.73	0.49	46.1	28.8	46.65	915	3.91
2	AM-5	1.5	2.2	5.132	2.109	3.423	55.8	0.73	0.49	45.3	28.4	46.27	908	3.88
3	AM-6	1.5	2.2	4.928	1.934	3.394	54.9	0.73	0.49	44.5	28.1	45.89	900	3.85
4	BM-1	1.5	2.2	5.332	1.881	3.851	70.4	0.73	0.49	58.7	33.4	51.92	1021	4.3
5	BM-1-1	1.5	2.2	5.332	1.929	3.803	68.6	0.73	0.49	57.1	32.8	51.28	1008	4.26
6	BM-2	1.5	2.2	5.132	1.71	3.822	69.3	0.73	0.49	57.7	33.1	51.54	1013	4.27
7	BM-2-1	1.5	2.2	5.132	1.758	3.774	67.6	0.73	0.49	56.2	32.5	50.9	1001	4.23
8	BM-3	1.5	2.2	4.928	1.534	3.794	68.3	0.73	0.49	56.8	32.7	51.17	1006	4.25
9	BM-3-1	1.5	2.2	4.928	1.582	3.746	66.6	0.73	0.49	55.2	32.2	50.53	993	4.2
10	CM-10	1.5	2.2	5.332	2.502	3.23	49.9	0.73	0.49	39.9	26.3	43.72	856	3.69
11	CM-11	1.5	2.2	5.132	2.331	3.201	49	0.73	0.49	39.1	26	43.34	849	3.68
12	CM-12	1.5	2.2	4.928	2.199	3.129	46.9	0.73	0.49	37.2	25.2	42.39	830	3.59
	Total						730	8.8	5.9	600	360	576	11,300	49

To oil separator

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlc (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-7	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
2	BM-5	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
3	CM-13	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
4	DM-11	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
	Total						380	4.4	3.0	273	167	296	6,020	38

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Manhole 1900 mm	Pay Item No. (BOQ)	2H - 0203
Quantity Item	Lean concrete	Unit	m³

Calculation Procedure Applied

Volume of lean concrete was computed by multiplying area by thickness.

References, Calculation Base and Revisions

See the item of excavation and disposal of 1200mm. (2H - 0201).

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
O	Koila Garcia			Hr. Inuma		Hr. Ando		
1								
2								
3								

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Manhole 1200mm	Calc. Index No.	
Subject	Lean concrete	Page No.	Rev.

References/ Notes

$$0.2 \qquad 0.2\ m$$

$$I\ 0.1\ m.$$

$$a$$

$$V = 0.1 \times a^2$$

Prepared by				Checked by			
			/ /200			/ /200

FN: Calculation_Sheet

Concrete cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlo (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-1	1.2	1.9	5.522	2.444	3.478	49.6	0.55	0.37	42.4	26.7	38.47	848	3.16
2	CM-1	1.2	1.9	5.582	3.399	2.583	27.4	0.55	0.37	21.9	17.7	28.59	823	2.42
3	CM-2	1.2	1.9	5.537	3.343	2.594	28	0.55	0.37	22.4	18	28.92	831	2.44
4	CM-3	1.2	1.9	5.437	3.303	2.534	20.8	0.55	0.37	21.3	17.5	28.27	816	2.4
5	CM-4	1.2	1.9	5.437	3.229	2.608	28.3	0.55	0.37	22.7	18.1	29.07	834	2.45
6	CM-4-1	1.2	1.9	5.537	3.269	2.668	29.5	0.55	0.37	23.8	18.7	29.72	849	2.5
7	CM-5	1.2	1.9	5.637	3.189	2.848	33.4	0.55	0.37	27.3	20.3	31.66	693	2.65
8	CM-5-1	1.2	1.9	5.637	3.205	2.832	33.1	0.55	0.37	27.1	20.2	31.49	689	2.64
9	CM-6	1.2	1.9	5.637	3.055	2.982	36.5	0.55	0.37	30.2	21.6	33.11	725	2.78
10	CM-7	1.2	1.9	5.857	2.691	3.566	52.2	0.55	0.37	44.8	27.7	39.42	867	3.23
11	CM8-1	1.2	1.9	5.507	2.755	3.152	40.7	0.55	0.37	34.1	23.3	34.95	766	2.9
12	CM8-1-1	1.2	1.9	5.592	2.819	3.173	41.3	0.55	0.37	34.6	23.5	35.17	772	2.91
13	CM-8-2	1.2	1.9	5.507	2.795	3.112	39.7	0.55	0.37	33.2	22.9	34.51	757	2.88
14	CM-8-2-1	1.2	1.9	5.602	2.821	3.181	41.5	0.55	0.37	34.8	23.6	35.26	773	2.92
15	CM-8-3	1.2	1.9	5.507	2.258	3.649	54.7	0.55	0.37	47.2	28.6	40.31	887	3.3
16	CM-8-4	1.2	1.9	5.507	2.895	3.012	37.3	0.55	0.37	30.9	21.9	33.43	732	2.78
17	DM-1	1.2	1.9	6.25	4.797	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
18	DM-2	1.2	1.9	5.5	3.147	2.753	31.3	0.55	0.37	25.4	19.5	30.64	669	2.57
19	DM-3	1.2	1.9	5.2	3.045	2.555	27.2	0.55	0.37	21.7	17.6	28.5	621	2.41
20	DM-4	1.2	1.9	5.34	3.125	2.615	28.4	0.55	0.37	22.8	18.2	29.15	636	2.46
21	DM-4-1	1.2	1.9	5.34	3.047	2.693	30.1	0.55	0.37	24.3	18.9	29.99	655	2.52
22	DM-5	1.2	1.9	5.34	2.865	2.875	34.1	0.55	0.37	28	20.6	31.95	699	2.67
23	DM-5-1	1.2	1.9	5.34	2.887	2.853	33.8	0.55	0.37	27.5	20.4	31.72	694	2.65
24	DM-7-1	1.2	1.9	5.17	2.683	2.887	34.3	0.55	0.37	28.2	20.7	32.08	702	2.68
25	DM-8-1	1.2	1.9	4.625	2.7	2.325	22.9	0.55	0.37	17.8	15.7	28.01	565	2.23
26	DM-9-1	1.2	1.9	5.01	2.546	2.864	33.8	0.55	0.37	27.7	20.5	31.84	696	2.66
27	DM-9-2	1.2	1.9	5.01	2.564	2.846	33.4	0.55	0.37	27.3	20.3	31.64	692	2.65
28	EM-1	1.2	1.9	6.06	3.897	2.583	27.4	0.55	0.37	21.9	17.7	28.59	623	2.42
29	EM-2	1.2	1.9	5.97	3.799	2.571	27.6	0.55	0.37	22	17.8	28.67	625	2.43
30	EM-2-1	1.2	1.9	5.97	3.808	2.562	27.4	0.55	0.37	21.9	17.7	28.57	623	2.42
31	EM-3	1.2	1.9	5.59	3.39	2.6	28.1	0.55	0.37	22.5	18	28.98	632	2.45
32	EM-4-2	1.2	1.9	5.43	3.972	1.858	15.5	0.55	0.37	11.2	11.9	20.97	452	1.85
33	EM-4-3	1.2	1.9	6.14	4.887	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
34	EM-4-4	1.2	1.9	6.25	4.797	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
	Total						1,090	18.7	12.6	883	662	1,040	22,600	87.0

Concrete cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlo (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-2	1.5	2.2	5.522	2.406	3.516	58.8	0.73	0.49	48.1	29.5	47.5	932	3.97
2	AM-3	1.5	2.2	5.332	2.328	3.404	55.2	0.73	0.49	44.8	28.2	46.02	903	3.86
3	AM-5-1	1.5	2.2	5.132	2.158	3.374	54.2	0.73	0.49	43.8	27.9	45.62	895	3.83
4	AM-6-1	1.5	2.2	4.928	1.982	3.346	53.4	0.73	0.49	43.1	27.6	45.25	887	3.8
5	AM-6-2	1.5	2.2	4.928	2.007	3.321	52.6	0.73	0.49	42.4	27.3	44.92	881	3.78
6	AM-7-1	1.5	2.2	4.711	1.797	3.314	52.4	0.73	0.49	42.2	27.2	44.83	879	3.77
7	BM-4	1.5	2.2	4.711	1.395	3.716	65.5	0.73	0.49	54.2	31.8	50.14	985	4.17
8	BM-5-1	1.5	2.2	4.711	1.373	3.738	66.3	0.73	0.49	55	32.1	50.43	991	4.19
9	CM-11-1	1.5	2.2	5.132	2.379	3.153	47.0	0.73	0.49	37.8	25.5	42.7	836	3.61
10	CM-12-1	1.5	2.2	4.928	2.247	3.081	45.6	0.73	0.49	36	24.7	41.75	817	3.54
11	CM-13-1	1.5	2.2	4.711	1.44	3.671	64	0.73	0.49	52.8	31.3	49.54	973	4.13
12	CM-8	1.5	2.2	5.507	2.62	3.287	51.6	0.73	0.49	41.5	26.9	44.47	872	3.75
13	CM-9	1.5	2.2	5.332	2.55	3.182	48.5	0.73	0.49	38.7	25.8	43.09	844	3.64
14	DM-10	1.5	2.2	4.844	2.084	3.16	47.8	0.73	0.49	38	25.5	42.8	838	3.62
15	DM-6	1.5	2.2	4.625	2.836	2.189	24.7	0.73	0.49	17.6	16.1	29.98	581	2.66
16	DM-7	1.5	2.2	5.17	2.665	2.905	40.8	0.73	0.49	31.7	22.9	39.43	770	3.37
17	DM-8	1.5	2.2	5.119	2.519	3	43.4	0.73	0.49	34.1	23.8	40.68	795	3.46
18	DM-9	1.5	2.2	5.019	2.739	2.68	35.2	0.73	0.49	26.7	20.6	38.46	711	3.14
19	EM-4	1.5	2.2	5.33	3.114	2.616	33.7	0.73	0.49	25.4	20	35.62	694	3.08
20	EM-4-1	1.5	2.2	5.33	3.306	2.424	29.5	0.73	0.49	21.7	18.2	33.08	643	2.89
21	EM-5	1.5	2.2	5.22	2.979	2.641	34.3	0.73	0.49	25.9	20.2	35.95	700	3.11
22	EM-5-1	1.5	2.2	5.22	3.001	2.619	33.8	0.73	0.49	25.5	20	35.66	695	3.08
23	EM-5-2	1.5	2.2	5.22	3.011	2.609	33.6	0.73	0.49	25.3	19.9	35.52	692	3.07
24	EM-6	1.5	2.2	4.89	2.669	2.621	33.9	0.73	0.49	25.6	20.1	35.68	695	3.09
	Total						1,110	17.6	11.8	880	600	1,000	19,600	85

Grating cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlo (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-4	1.5	2.2	5.332	2.28	3.452	56.7	0.73	0.49	46.1	28.8	46.65	915	3.91
2	AM-5	1.5	2.2	5.132	2.109	3.423	55.8	0.73	0.49	45.3	28.4	46.27	908	3.88
3	AM-6	1.5	2.2	4.928	1.934	3.394	54.9	0.73	0.49	44.5	28.1	45.89	900	3.85
4	BM-1	1.5	2.2	5.332	1.881	3.851	70.4	0.73	0.49	58.7	33.4	51.92	1021	4.3
5	BM-1-1	1.5	2.2	5.332	1.929	3.803	68.6	0.73	0.49	57.1	32.8	51.28	1008	4.26
6	BM-2	1.5	2.2	5.132	1.71	3.622	67.7	0.73	0.49	57.7	33.1	51.54	1013	4.27
7	BM-2-1	1.5	2.2	5.132	1.758	3.774	67.6	0.73	0.49	56.2	32.5	50.9	1001	4.23
8	BM-3	1.5	2.2	4.928	1.534	3.794	68.3	0.73	0.49	56.8	32.7	51.17	1006	4.25
9	BM-3-1	1.5	2.2	4.928	1.582	3.746	66.6	0.73	0.49	55.2	32.2	50.53	993	4.2
10	CM-10	1.5	2.2	5.332	2.502	3.23	49.9	0.73	0.49	39.9	26.3	43.72	856	3.69
11	CM-11	1.5	2.2	5.132	2.331	3.201	49	0.73	0.49	39.1	26	43.34	849	3.66
12	CM-12	1.5	2.2	4.928	2.199	3.129	46.9	0.73	0.49	37.2	25.2	42.39	830	3.59
	Total						730	8.8	5.9	600	360	576	11,300	49

To oil separator

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlo (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-7	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
2	BM-5	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
3	CM-13	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
4	DM-11	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
	Total						380	4.4	3.0	273	167	296	6,020	38

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Manhole 1200 mm	**Pay Item No. (BOQ)**	2H-0804
Quantity Item	Reinforcement	**Unit**	kg

Calculation Procedure Applied

Weight of reinforcement was computed by multiplying unit weight by the height. Unit weight was computed on assumption that the height was 2m.

References. Calculation Base and Revisions

See the item of excavation and disposal of 1200 mm.   (2H-0801)

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

TABLE OF REINFORCEMENT (MANHOLE)

No.	D	L (m)	Qty	W/bar (kg)	W (kg)	Remarks
Manhole (H=2m, 1500)						
A1	D13	4.00	28	3.98	111.44	
A2	D13	3.40	26	3.383	87.96	
B1	D13	2.55	48	2.53725	121.79	
B2	D13	2.40	44	2.388	105.07	
C1	D13	2.60	22	2.587	56.91	
C2	D13	2.30	20	2.2885	45.77	
				total	528.94	1 spot
					265	1 spot / m
Manhole (H=2m, 1200)						
A1	D13	3.40	28	3.383	94.72	
A2	D13	2.80	26	2.786	72.44	
B1	D13	2.55	48	2.53725	121.79	
B2	D13	2.40	44	2.388	105.07	
C1	D13	2.30	22	2.2885	50.35	
C2	D13	2.00	20	1.99	39.8	
				total	484.17	1 spot
					243	1 spot / m

Concrete cover

#		W (m)	a (m)	O.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlo (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-1	1.2	1.9	5.522	2.444	3.478	49.6	0.55	0.37	42.4	26.7	38.47	846	3.18
2	CM-1	1.2	1.9	5.562	3.399	2.563	27.4	0.55	0.37	21.9	17.7	28.59	623	2.42
3	CM-2	1.2	1.9	5.537	3.343	2.594	28	0.55	0.37	22.4	18	28.92	631	2.44
4	CM-3	1.2	1.9	5.437	3.303	2.534	26.8	0.55	0.37	21.3	17.5	28.27	616	2.4
5	CM-4	1.2	1.9	5.437	3.229	2.608	28.3	0.55	0.37	22.7	18.1	29.07	634	2.45
6	CM-4-1	1.2	1.9	5.537	3.269	2.668	29.5	0.55	0.37	23.8	18.7	29.72	649	2.5
7	CM-5	1.2	1.9	5.637	3.189	2.848	33.4	0.55	0.37	27.3	20.3	31.86	693	2.65
8	CM-5-1	1.2	1.9	5.637	3.205	2.832	33.1	0.55	0.37	27.1	20.2	31.49	689	2.64
9	CM-6	1.2	1.9	5.637	3.055	2.982	36.5	0.55	0.37	30.2	21.6	33.11	725	2.76
10	CM-7	1.2	1.9	5.857	2.691	3.566	52.2	0.55	0.37	44.8	27.7	39.42	867	3.23
11	CM8-1	1.2	1.9	5.507	2.755	3.152	40.7	0.55	0.37	34.1	23.3	34.95	766	2.9
12	CM8-1-1	1.2	1.9	5.592	2.819	3.173	41.3	0.55	0.37	34.6	23.5	35.17	772	2.91
13	CM-8-2	1.2	1.9	5.507	2.795	3.112	39.7	0.55	0.37	33.2	22.9	34.51	757	2.86
14	CM-8-2-1	1.2	1.9	5.602	2.821	3.181	41.5	0.55	0.37	34.8	23.6	35.26	773	2.92
15	CM-8-3	1.2	1.9	5.507	2.258	3.649	54.7	0.55	0.37	47.2	28.6	40.31	887	3.3
16	CM-8-4	1.2	1.9	5.507	2.895	3.012	37.3	0.55	0.37	30.9	21.9	33.43	732	2.78
17	DM-1	1.2	1.9	6.25	4.797	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
18	DM-2	1.2	1.9	5.5	3.147	2.753	31.3	0.55	0.37	25.4	19.5	30.64	669	2.57
19	DM-3	1.2	1.9	5.2	3.045	2.555	27.2	0.55	0.37	21.7	17.6	28.5	621	2.41
20	DM-4	1.2	1.9	5.34	3.125	2.615	28.4	0.55	0.37	22.8	18.2	29.15	636	2.46
21	DM-4-1	1.2	1.9	5.34	3.047	2.693	30.1	0.55	0.37	24.3	18.9	29.99	655	2.52
22	DM-5	1.2	1.9	5.34	2.865	2.875	34.1	0.55	0.37	28	20.6	31.95	699	2.67
23	DM-5-1	1.2	1.9	5.34	2.887	2.853	33.6	0.55	0.37	27.5	20.4	31.72	694	2.65
24	DM-7-1	1.2	1.9	5.17	2.683	2.887	34.3	0.55	0.37	28.2	20.7	32.08	702	2.68
25	DM-8-1	1.2	1.9	4.625	2.7	2.325	22.9	0.55	0.37	17.8	15.7	26.01	565	2.23
26	DM-9-1	1.2	1.9	5.01	2.546	2.864	33.8	0.55	0.37	27.7	20.5	31.84	696	2.66
27	DM-9-2	1.2	1.9	5.01	2.564	2.846	33.4	0.55	0.37	27.3	20.3	31.64	692	2.65
28	EM-1	1.2	1.9	6.06	3.897	2.563	27.4	0.55	0.37	21.9	17.7	28.59	623	2.42
29	EM-2	1.2	1.9	5.97	3.799	2.571	27.6	0.55	0.37	22	17.8	28.67	625	2.43
30	EM-2-1	1.2	1.9	5.97	3.808	2.562	27.4	0.55	0.37	21.9	17.7	28.57	623	2.42
31	EM-3	1.2	1.9	5.59	3.39	2.6	28.1	0.55	0.37	22.5	18	28.98	632	2.45
32	EM-4-2	1.2	1.9	5.43	3.972	1.858	15.5	0.55	0.37	11.2	11.9	20.97	452	1.85
33	EM-4-3	1.2	1.9	6.14	4.687	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
34	EM-4-4	1.2	1.9	6.25	4.797	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
	Total						1,090	18.7	12.6	883	662	1,040	22,600	87.0

Concrete cover

#		W (m)	a (m)	O.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlo (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-2	1.5	2.2	5.522	2.406	3.516	58.8	0.73	0.49	48.1	29.5	47.5	932	3.97
2	AM-3	1.5	2.2	5.332	2.328	3.404	55.2	0.73	0.49	44.8	28.2	46.02	903	3.86
3	AM-5-1	1.5	2.2	5.132	2.158	3.374	54.2	0.73	0.49	43.8	27.9	45.62	895	3.83
4	AM-6-1	1.5	2.2	4.928	1.982	3.346	53.4	0.73	0.49	43.1	27.6	45.25	887	3.8
5	AM-6-2	1.5	2.2	4.928	2.007	3.321	52.6	0.73	0.49	42.4	27.3	44.92	881	3.78
6	AM-7-1	1.5	2.2	4.711	1.797	3.314	52.4	0.73	0.49	42.2	27.2	44.83	879	3.77
7	BM-4	1.5	2.2	4.711	1.395	3.716	65.5	0.73	0.49	54.2	31.8	50.14	985	4.17
8	BM-5-1	1.5	2.2	4.711	1.373	3.738	66.3	0.73	0.49	55	32.1	50.43	991	4.19
9	CM-11-1	1.5	2.2	5.132	2.379	3.153	47.6	0.73	0.49	37.8	25.5	42.7	836	3.61
10	CM-12-1	1.5	2.2	4.928	2.247	3.081	45.6	0.73	0.49	36	24.7	41.75	817	3.54
11	CM-13-1	1.5	2.2	4.711	1.44	3.671	64	0.73	0.49	52.8	31.3	49.54	973	4.13
12	CM-8	1.5	2.2	5.507	2.62	3.287	51.6	0.73	0.49	41.5	26.9	44.47	872	3.75
13	CM-9	1.5	2.2	5.332	2.55	3.182	48.5	0.73	0.49	38.7	25.8	43.09	844	3.64
14	DM-10	1.5	2.2	4.844	2.084	3.16	47.8	0.73	0.49	38	25.5	42.8	838	3.62
15	DM-6	1.5	2.2	4.625	2.836	2.189	24.7	0.73	0.49	17.6	16.1	29.98	581	2.66
16	DM-7	1.5	2.2	5.17	2.685	2.905	40.8	0.73	0.49	31.7	22.9	39.43	770	3.37
17	DM-8	1.5	2.2	5.119	2.519	3	43.4	0.73	0.49	34.1	23.8	40.68	795	3.46
18	DM-9	1.5	2.2	5.019	2.739	2.68	35.2	0.73	0.49	26.7	20.6	38.46	711	3.14
19	EM-4	1.5	2.2	5.33	3.114	2.616	33.7	0.73	0.49	25.4	20	35.62	694	3.08
20	EM-4-1	1.5	2.2	5.33	3.306	2.424	29.5	0.73	0.49	21.7	18.2	33.08	643	2.89
21	EM-5	1.5	2.2	5.22	2.979	2.641	34.3	0.73	0.49	25.9	20.2	35.95	700	3.11
22	EM-5-1	1.5	2.2	5.22	3.001	2.619	33.8	0.73	0.49	25.5	20	35.66	695	3.08
23	EM-5-2	1.5	2.2	5.22	3.011	2.609	33.6	0.73	0.49	25.3	19.9	35.52	692	3.07
24	EM-6	1.5	2.2	4.89	2.669	2.621	33.9	0.73	0.49	25.6	20.1	35.68	695	3.09
	Total						1,110	17.6	11.8	880	600	1,000	19,600	85

Grating cover

#		W (m)	a (m)	O.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlo (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-4	1.5	2.2	5.332	2.28	3.452	56.7	0.73	0.49	46.1	28.8	46.65	915	3.91
2	AM-5	1.5	2.2	5.132	2.109	3.423	55.8	0.73	0.49	45.3	28.4	46.27	908	3.88
3	AM-6	1.5	2.2	4.928	1.934	3.394	54.9	0.73	0.49	44.5	28.1	45.89	900	3.85
4	BM-1	1.5	2.2	5.332	1.881	3.851	70.4	0.73	0.49	58.7	33.4	51.92	1021	4.3
5	BM-1-1	1.5	2.2	5.332	1.929	3.803	68.6	0.73	0.49	57.1	32.8	51.28	1008	4.26
6	BM-2	1.5	2.2	5.132	1.71	3.822	69.3	0.73	0.49	57.7	33.1	51.54	1013	4.27
7	BM-2-1	1.5	2.2	5.132	1.758	3.774	67.6	0.73	0.49	56.2	32.5	50.9	1001	4.23
8	BM-3	1.5	2.2	4.928	1.534	3.794	68.3	0.73	0.49	56.8	32.7	51.17	1006	4.25
9	BM-3-1	1.5	2.2	4.928	1.582	3.746	66.6	0.73	0.49	55.2	32.2	50.53	993	4.2
10	CM-10	1.5	2.2	5.332	2.502	3.23	49.9	0.73	0.49	39.9	26.3	43.72	856	3.69
11	CM-11	1.5	2.2	5.132	2.331	3.201	49	0.73	0.49	39.1	26	43.34	849	3.66
12	CM-12	1.5	2.2	4.928	2.199	3.129	46.9	0.73	0.49	37.2	25.2	42.39	830	3.59
	Total						730	8.8	5.9	600	360	576	11,300	49

To oil separator

#		W (m)	a (m)	O.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlo (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-7	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
2	BM-5	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
3	CM-13	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
4	DM-11	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
	Total						380	4.4	3.0	273	167	296	6,020	38

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Manhole 1200 mm	Pay Item No. (BOQ)	2H - 0805
Quantity Item	Coner Angle	Unit	kg

Calculation Procedure Applied

Weight of corner angle was computed by multiplying unit weight by the length.

References. Calculation Base and Revisions

See the item of excavation and disposal of 1200 mm.   (2H - 0201)

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

Grating type
size (mm) 1594x795x100x2　　　　　　　N=　　　12　　　spots

	Form (side) (m2)	Form (bottom) (m2)	Re-bar (D13) (kg)	Concrete (m3)	L50x50x6 (m)	(kg)	Re-bar (D9) (kg)
spot					7.2	31.9	1.2
total					86.4	383	14.4

Concrete type
size (mm) 1280 x 425 x 100 x 3　　　　　　N=　　　34　　　spots

	Form (side) (m2)	Form (bottom) (m2)	Re-bar (D13) (kg)	Concrete (m3)	L50x50x6 (m)	(kg)	Re-bar (D9) (kg)
one	0.168	0.55	6.87	0.055			
spot	0.504	1.65	20.61	0.165	6	26.6	1.0
total	17.2	56.1	701	5.61	204.0	905	34.0

size (mm) 1580 x 520 x 100 x 3　　　　　　N=　　　24　　　spots

	Form (side) (m2)	Form (bottom) (m2)	Re-bar (D13) (kg)	Concrete (m3)	L50x50x6 (m)	(kg)	Re-bar (D9) (kg)
one	0.42	0.83	10.15	0.083			
spot	1.26	2.49	30.45	0.249	7.2	31.9	1.2
total	30.3	59.8	730.8	5.98	172.8	766	28.8

size (mm) 1580 x 520 x 100 x 2　　　　　　N=　　　4　　　spots
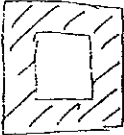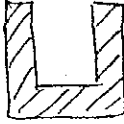
	Form (side) (m2)	Form (bottom) (m2)	Re-bar (D13) (kg)	Concrete (m3)	L50x50x6 (m)	(kg)	Re-bar (D9) (kg)
one	0.42	0.83	10.15	0.083			
spot	0.84	1.66	20.3	0.166	7.2	31.9	1.2
total	3.4	6.7	81.2	0.7	28.8	128	4.8

Manhole Cover

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Manhole 1800 mm	Pay Item No. (BOQ)	2H-080601
Quantity Item	Form for Manhole	Unit	m²

Calculation Procedure Applied

Area of form for manhole was computed by combining inside with outside.

References, Calculation Base and Revisions

See the item of excavation and disposal of 1800mm. (2H-0801).

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

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Manhole 1200 m m	Calc. Index No.	
Subject	Form for Manhole	Page No.	Rev.

References/Notes

1200 mm

h

150 mm

1200 mm

150 mm

1500 mm

$$A = 1.5 \times (h + 0.15) \times 4 + 1.2 \times h \times 4$$

Prepared by		Checked by	
	/ /200		/ /200

FN: Calculation_Sheet

249

Concrete cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlc (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-1	1.2	1.9	5.522	2.444	3.478	49.6	0.55	0.37	42.4	26.7	38.47	846	3.16
2	CM-1	1.2	1.9	5.562	3.399	2.563	27.4	0.55	0.37	21.9	17.7	28.59	623	2.42
3	CM-2	1.2	1.9	5.537	3.343	2.594	28	0.55	0.37	22.4	18	28.92	631	2.44
4	CM-3	1.2	1.9	5.437	3.303	2.534	26.8	0.55	0.37	21.3	17.5	28.27	616	2.4
5	CM-4	1.2	1.9	5.437	3.229	2.608	28.3	0.55	0.37	22.7	18.1	29.07	634	2.45
6	CM-4-1	1.2	1.9	5.537	3.269	2.668	29.5	0.55	0.37	23.8	18.7	29.72	649	2.5
7	CM-5	1.2	1.9	5.637	3.189	2.848	33.4	0.55	0.37	27.3	20.3	31.68	693	2.65
8	CM-5-1	1.2	1.9	5.637	3.205	2.832	33.1	0.55	0.37	27.1	20.2	31.49	689	2.64
9	CM-6	1.2	1.9	5.637	3.055	2.982	36.5	0.55	0.37	30.2	21.6	33.11	725	2.76
10	CM-7	1.2	1.9	5.857	2.691	3.566	52.2	0.55	0.37	44.8	27.7	39.42	867	3.23
11	CM8-1	1.2	1.9	5.507	2.755	3.152	40.7	0.55	0.37	34.1	23.3	34.95	766	2.9
12	CM8-1-1	1.2	1.9	5.592	2.819	3.173	41.3	0.55	0.37	34.6	23.5	35.17	772	2.91
13	CM-8-2	1.2	1.9	5.507	2.795	3.112	39.7	0.55	0.37	33.2	22.9	34.51	757	2.86
14	CM-8-2-1	1.2	1.9	5.602	2.821	3.181	41.5	0.55	0.37	34.8	23.6	35.26	773	2.92
15	CM-8-3	1.2	1.9	5.507	2.258	3.649	54.7	0.55	0.37	47.2	28.6	40.31	887	3.3
16	CM-8-4	1.2	1.9	5.507	2.895	3.012	37.3	0.55	0.37	30.9	21.9	33.43	732	2.78
17	DM-1	1.2	1.9	6.25	4.797	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
18	DM-2	1.2	1.9	5.5	3.147	2.753	31.3	0.55	0.37	25.4	19.5	30.64	669	2.57
19	DM-3	1.2	1.9	5.2	3.045	2.555	27.2	0.55	0.37	21.7	17.6	28.5	621	2.41
20	DM-4	1.2	1.9	5.34	3.125	2.615	28.4	0.55	0.37	22.8	18.2	29.15	636	2.46
21	DM-4-1	1.2	1.9	5.34	3.047	2.693	30.1	0.55	0.37	24.3	18.9	29.99	655	2.52
22	DM-5	1.2	1.9	5.34	2.865	2.875	34.1	0.55	0.37	28	20.6	31.95	699	2.67
23	DM-5-1	1.2	1.9	5.34	2.887	2.853	33.6	0.55	0.37	27.5	20.4	31.72	694	2.65
24	DM-7-1	1.2	1.9	5.17	2.683	2.887	34.3	0.55	0.37	28.2	20.7	32.08	702	2.68
25	DM-8-1	1.2	1.9	4.625	2.7	2.325	22.9	0.55	0.37	17.8	15.7	26.01	565	2.23
26	DM-9-1	1.2	1.9	5.01	2.546	2.864	33.8	0.55	0.37	27.7	20.5	31.84	696	2.66
27	DM-9-2	1.2	1.9	5.01	2.584	2.846	33.4	0.55	0.37	27.3	20.3	31.64	692	2.65
28	EM-1	1.2	1.9	6.06	3.897	2.563	27.4	0.55	0.37	21.9	17.7	28.59	623	2.42
29	EM-2	1.2	1.9	5.97	3.799	2.571	27.6	0.55	0.37	22	17.8	28.67	625	2.43
30	EM-2-1	1.2	1.9	5.97	3.808	2.562	27.4	0.55	0.37	21.9	17.7	28.57	623	2.42
31	EM-3	1.2	1.9	5.59	3.39	2.6	28.1	0.55	0.37	22.5	18	28.98	632	2.45
32	EM-4-2	1.2	1.9	5.43	3.972	1.858	15.5	0.55	0.37	11.2	11.9	20.97	452	1.85
33	EM-4-3	1.2	1.9	6.14	4.887	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
34	EM-4-4	1.2	1.9	6.25	4.797	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
	Total						1,090	18.7	12.6	883	662	1,040	22,600	87.0

Concrete cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlc (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-2	1.5	2.2	5.522	2.406	3.516	58.8	0.73	0.49	48.1	29.5	47.5	932	3.97
2	AM-3	1.5	2.2	5.332	2.328	3.404	55.2	0.73	0.49	44.8	28.2	46.02	903	3.86
3	AM-5-1	1.5	2.2	5.132	2.158	3.374	54.2	0.73	0.49	43.8	27.9	45.62	895	3.83
4	AM-6-1	1.5	2.2	4.928	1.982	3.346	53.4	0.73	0.49	43.1	27.6	45.25	887	3.8
5	AM-8-2	1.5	2.2	4.928	2.007	3.321	52.6	0.73	0.49	42.4	27.3	44.92	881	3.78
6	BM-7-1	1.5	2.2	4.711	1.797	3.314	52.4	0.73	0.49	42.2	27.2	44.83	879	3.77
7	BM-4	1.5	2.2	4.711	1.395	3.716	65.5	0.73	0.49	54.2	31.8	50.14	985	4.17
8	BM-5-1	1.5	2.2	4.711	1.373	3.738	66.3	0.73	0.49	55	32.1	50.43	991	4.19
9	CM-11-1	1.5	2.2	5.132	2.379	3.153	47.6	0.73	0.49	37.8	25.5	42.7	836	3.61
10	CM-12-1	1.5	2.2	4.928	2.247	3.081	45.6	0.73	0.49	36	24.7	41.75	817	3.54
11	CM-13-1	1.5	2.2	4.711	1.44	3.671	64	0.73	0.49	52.8	31.3	49.54	973	4.13
12	CM-8	1.5	2.2	5.507	2.62	3.287	51.6	0.73	0.49	41.5	26.9	44.47	872	3.75
13	CM-9	1.5	2.2	5.332	2.55	3.182	48.5	0.73	0.49	38.7	25.8	43.09	844	3.64
14	DM-10	1.5	2.2	4.844	2.084	3.16	47.8	0.73	0.49	38	25.5	42.8	838	3.62
15	DM-6	1.5	2.2	4.625	2.836	2.189	24.7	0.73	0.49	17.6	16.1	29.98	581	2.66
16	DM-7	1.5	2.2	5.17	2.665	2.905	40.8	0.73	0.49	31.7	22.9	39.43	770	3.37
17	DM-8	1.5	2.2	5.119	2.519	3	43.4	0.73	0.49	34.1	23.8	40.68	795	3.46
18	DM-9	1.5	2.2	5.019	2.739	2.68	35.2	0.73	0.49	26.7	20.6	38.46	711	3.14
19	EM-4	1.5	2.2	5.33	3.114	2.616	33.7	0.73	0.49	25.4	20	35.82	694	3.08
20	EM-4-1	1.5	2.2	5.33	3.306	2.424	29.5	0.73	0.49	21.7	18.2	33.08	643	2.89
21	EM-5	1.5	2.2	5.22	2.979	2.641	34.3	0.73	0.49	25.9	20.2	35.95	700	3.11
22	EM-5-1	1.5	2.2	5.22	3.001	2.619	33.8	0.73	0.49	25.5	20	35.66	695	3.08
23	EM-5-2	1.5	2.2	5.22	3.011	2.609	33.6	0.73	0.49	25.3	19.9	35.52	692	3.07
24	EM-6	1.5	2.2	4.89	2.669	2.821	33.9	0.73	0.49	25.6	20.1	35.68	695	3.09
	Total						1,110	17.6	11.8	880	600	1,000	19,600	85

Grating cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlc (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-4	1.5	2.2	5.332	2.28	3.452	56.7	0.73	0.49	46.1	28.8	46.85	915	3.91
2	AM-5	1.5	2.2	5.132	2.109	3.423	55.8	0.73	0.49	45.3	28.4	46.27	908	3.88
3	AM-6	1.5	2.2	4.928	1.934	3.394	54.9	0.73	0.49	44.5	28.1	45.89	900	3.85
4	BM-1	1.5	2.2	5.332	1.881	3.851	70.4	0.73	0.49	58.7	33.4	51.92	1021	4.3
5	BM-1-1	1.5	2.2	5.332	1.929	3.803	68.6	0.73	0.49	57.1	32.8	51.28	1008	4.26
6	BM-2	1.5	2.2	5.132	1.71	3.822	69.3	0.73	0.49	57.7	33.1	51.54	1013	4.27
7	BM-2-1	1.5	2.2	5.132	1.758	3.774	67.6	0.73	0.49	56.2	32.5	50.9	1001	4.23
8	BM-3	1.5	2.2	4.928	1.534	3.794	68.3	0.73	0.49	56.8	32.7	51.17	1006	4.25
9	BM-3-1	1.5	2.2	4.928	1.582	3.746	66.6	0.73	0.49	55.2	32.2	50.53	993	4.2
10	CM-10	1.5	2.2	5.332	2.502	3.23	49.9	0.73	0.49	39.9	26.3	43.72	856	3.69
11	CM-11	1.5	2.2	5.132	2.331	3.201	49	0.73	0.49	39.1	26	43.34	849	3.66
12	CM-12	1.5	2.2	4.928	2.199	3.129	46.9	0.73	0.49	37.2	25.2	42.39	830	3.59
	Total						730	8.8	5.9	600	360	576	11,300	49

To oil separator

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlc (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-7	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
2	BM-5	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
3	CM-13	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
4	DM-11	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
	Total						380	4.4	3.0	273	167	296	6,020	38

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Manhole 1200 mm	Pay Item No. (BOQ)	2H-080602
Quantity Item	Concrete for manhole	Unit	m³

Calculation Procedure Applied

Height = Ground Level — Bottom Level + 0.15 (m)

Volume of concrete for manhole was computed by outer volume minus inner volume.

Top view   side view

References, Calculation Base and Revisions

See the item of excavation and disposal of 1200 mm. (2H-0801)

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

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Manhole 1200 mm	Calc. Index No.	
Subject	Concrete for manhole	Page No.	Rev.

References/
Notes

0.15m   0.15m

h

1.2 m

0.15m

0.15m

1.8 m   1.5 m

0.15m

$$V = 1.5 \times 1.5 \times (h + 0.15) - 1.2 \times 1.2 \times h$$

		Prepared by			Checked by		
			/	/200		/	/200

Concrete cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlc (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-1	1.2	1.9	6.522	2.444	3.478	49.6	0.65	0.37	42.4	26.7	38.47	846	3.16
2	CM-1	1.2	1.9	6.562	3.399	2.563	27.4	0.55	0.37	21.9	17.7	28.59	623	2.42
3	CM-2	1.2	1.9	5.537	3.343	2.594	28	0.55	0.37	22.4	18	28.92	631	2.44
4	CM-3	1.2	1.9	5.437	3.303	2.534	26.8	0.55	0.37	21.3	17.5	28.27	616	2.4
5	CM-4	1.2	1.9	5.437	3.229	2.608	28.3	0.55	0.37	22.7	18.1	29.07	634	2.45
6	CM-4-1	1.2	1.9	5.537	3.269	2.668	29.5	0.55	0.37	23.8	18.7	29.72	649	2.5
7	CM-5	1.2	1.9	5.637	3.189	2.848	33.4	0.55	0.37	27.3	20.3	31.66	693	2.65
8	CM-5-1	1.2	1.9	5.637	3.205	2.832	33.1	0.55	0.37	27.1	20.2	31.49	689	2.64
9	CM-6	1.2	1.9	5.637	3.055	2.982	36.5	0.55	0.37	30.2	21.6	33.11	725	2.76
10	CM-7	1.2	1.9	5.857	2.691	3.566	52.2	0.55	0.37	44.8	27.7	39.42	867	3.23
11	CM8-1	1.2	1.9	5.507	2.755	3.152	40.7	0.55	0.37	34.1	23.3	34.95	766	2.9
12	CM8-1-1	1.2	1.9	5.592	2.819	3.173	41.3	0.55	0.37	34.6	23.5	35.17	772	2.91
13	CM-8-2	1.2	1.9	5.507	2.795	3.112	39.7	0.55	0.37	33.2	22.9	34.51	757	2.86
14	CM-8-2-1	1.2	1.9	5.602	2.821	3.181	41.5	0.55	0.37	34.8	23.6	35.26	773	2.92
15	CM-8-3	1.2	1.9	5.507	2.258	3.649	54.7	0.55	0.37	47.2	28.6	40.31	887	3.3
16	CM-8-4	1.2	1.9	5.507	2.895	3.012	37.3	0.55	0.37	30.9	21.9	33.43	732	2.78
17	DM-1	1.2	1.9	6.25	4.797	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
18	DM-2	1.2	1.9	5.5	3.147	2.753	31.3	0.55	0.37	25.4	19.5	30.64	669	2.57
19	DM-3	1.2	1.9	5.2	3.045	2.555	27.2	0.55	0.37	21.7	17.6	28.5	621	2.41
20	DM-4	1.2	1.9	5.34	3.125	2.615	28.4	0.55	0.37	22.8	18.2	29.15	636	2.46
21	DM-4-1	1.2	1.9	5.34	3.047	2.693	30.1	0.55	0.37	24.3	18.9	29.99	655	2.52
22	DM-5	1.2	1.9	5.34	2.865	2.875	34.1	0.55	0.37	28	20.6	31.95	699	2.67
23	DM-5-1	1.2	1.9	5.34	2.887	2.853	33.6	0.55	0.37	27.5	20.4	31.72	694	2.65
24	DM-7-1	1.2	1.9	5.17	2.683	2.887	34.3	0.55	0.37	28.2	20.7	32.08	702	2.68
25	DM-8-1	1.2	1.9	4.625	2.7	2.325	22.9	0.55	0.37	17.8	15.7	26.01	565	2.23
26	DM-9-1	1.2	1.9	5.01	2.546	2.864	33.8	0.55	0.37	27.7	20.5	31.84	696	2.66
27	DM-9-2	1.2	1.9	5.01	2.564	2.846	33.4	0.55	0.37	27.3	20.3	31.64	692	2.65
28	EM-1	1.2	1.9	6.06	3.897	2.563	27.4	0.55	0.37	21.9	17.7	28.59	623	2.42
29	EM-2	1.2	1.9	5.97	3.799	2.571	27.6	0.55	0.37	22	17.8	28.67	625	2.43
30	EM-2-1	1.2	1.9	5.97	3.808	2.562	27.4	0.55	0.37	21.9	17.7	28.57	623	2.42
31	EM-3	1.2	1.9	5.59	3.39	2.6	28.1	0.55	0.37	22.5	18	28.98	632	2.45
32	EM-4-2	1.2	1.9	5.43	3.972	1.858	15.5	0.55	0.37	11.2	11.9	20.97	452	1.85
33	EM-4-3	1.2	1.9	6.14	4.887	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
34	EM-4-4	1.2	1.9	6.25	4.797	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
	Total						1,090	18.7	12.6	883	662	1,040	22,600	87.0

Concrete cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlc (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-2	1.5	2.2	5.522	2.406	3.516	58.8	0.73	0.49	48.1	29.5	47.5	932	3.97
2	AM-3	1.5	2.2	5.332	2.328	3.404	55.2	0.73	0.49	44.8	28.2	46.02	903	3.86
3	AM-5-1	1.5	2.2	5.132	2.158	3.374	54.2	0.73	0.49	43.8	27.9	45.62	895	3.83
4	AM-6-1	1.5	2.2	4.928	1.982	3.346	53.4	0.73	0.49	43.1	27.6	45.25	887	3.8
5	AM-6-2	1.5	2.2	4.928	2.007	3.321	52.6	0.73	0.49	42.4	27.3	44.92	881	3.78
6	AM-7-1	1.5	2.2	4.711	1.797	3.314	52.4	0.73	0.49	42.2	27.2	44.83	879	3.77
7	BM-4	1.5	2.2	4.711	1.395	3.716	65.5	0.73	0.49	54.2	31.8	50.14	985	4.17
8	BM-5-1	1.5	2.2	4.711	1.373	3.738	66.3	0.73	0.49	55	32.1	50.43	991	4.19
9	CM-11-1	1.5	2.2	5.132	2.379	3.153	47.6	0.73	0.49	37.8	25.5	42.7	836	3.61
10	CM-12-1	1.5	2.2	4.928	2.247	3.081	45.6	0.73	0.49	36	24.7	41.75	817	3.54
11	CM-13-1	1.5	2.2	4.711	1.44	3.671	64	0.73	0.49	52.8	31.3	49.54	973	4.13
12	CM-8	1.5	2.2	5.507	2.62	3.287	51.6	0.73	0.49	41.5	26.9	44.47	872	3.75
13	CM-9	1.5	2.2	5.332	2.55	3.182	48.5	0.73	0.49	38.7	25.8	43.09	844	3.64
14	DM-10	1.5	2.2	4.844	2.084	3.18	47.8	0.73	0.49	38	25.5	42.8	838	3.62
15	DM-6	1.5	2.2	4.625	2.836	2.189	24.7	0.73	0.49	17.6	16.1	29.98	581	2.66
16	DM-7	1.5	2.2	5.17	2.665	2.905	40.8	0.73	0.49	31.7	22.9	39.43	770	3.37
17	DM-8	1.5	2.2	5.119	2.519	3	43.4	0.73	0.49	34.1	23.8	40.68	795	3.46
18	DM-9	1.5	2.2	5.019	2.739	2.68	35.2	0.73	0.49	26.7	20.6	38.46	711	3.14
19	EM-4	1.5	2.2	5.33	3.114	2.616	33.7	0.73	0.49	25.4	20	35.62	694	3.08
20	EM-4-1	1.5	2.2	5.33	3.306	2.424	29.5	0.73	0.49	21.7	18.2	33.08	643	2.89
21	EM-5	1.5	2.2	5.22	2.979	2.641	34.3	0.73	0.49	25.9	20.2	35.95	700	3.11
22	EM-5-1	1.5	2.2	5.22	3.001	2.619	33.8	0.73	0.49	25.5	20	35.66	695	3.08
23	EM-5-2	1.5	2.2	5.22	3.011	2.609	33.6	0.73	0.49	25.3	19.9	35.52	692	3.07
24	EM-6	1.5	2.2	4.89	2.669	2.621	33.9	0.73	0.49	25.6	20.1	35.88	695	3.09
	Total						1,110	17.6	11.8	880	600	1,000	19,600	85

Grating cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlc (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-4	1.5	2.2	5.332	2.28	3.452	56.7	0.73	0.49	46.1	28.8	46.65	915	3.91
2	AM-5	1.5	2.2	5.132	2.109	3.423	55.8	0.73	0.49	45.3	28.4	46.27	908	3.88
3	AM-6	1.5	2.2	4.928	1.934	3.394	54.9	0.73	0.49	44.5	28.1	45.89	900	3.85
4	BM-1	1.5	2.2	5.332	1.881	3.851	70.4	0.73	0.49	58.7	33.4	51.92	1021	4.3
5	BM-1-1	1.5	2.2	5.332	1.929	3.803	68.6	0.73	0.49	57.1	32.8	51.28	1008	4.26
6	BM-2	1.5	2.2	5.132	1.71	3.822	69.3	0.73	0.49	57.7	33.1	51.54	1013	4.27
7	BM-2-1	1.5	2.2	5.132	1.758	3.774	67.6	0.73	0.49	56.2	32.5	50.9	1001	4.23
8	BM-3	1.5	2.2	4.928	1.534	3.794	68.3	0.73	0.49	56.8	32.7	51.17	1006	4.25
9	BM-3-1	1.5	2.2	4.928	1.582	3.746	66.6	0.73	0.49	55.2	32.2	50.53	993	4.2
10	CM-10	1.5	2.2	5.332	2.502	3.23	49.9	0.73	0.49	39.9	26.3	43.72	856	3.69
11	CM-11	1.5	2.2	5.132	2.331	3.201	49	0.73	0.49	39.1	26	43.34	849	3.66
12	CM-12	1.5	2.2	4.928	2.199	3.129	46.9	0.73	0.49	37.2	25.2	42.39	830	3.59
	Total						730	8.8	5.9	600	360	576	11,300	49

To oil separator

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlc (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-7	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
2	BM-5	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
3	CM-13	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
4	DM-11	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
	Total						380	4.4	3.0	273	167	296	6,020	38

QUANTITY CALCULATION COVER SHEET

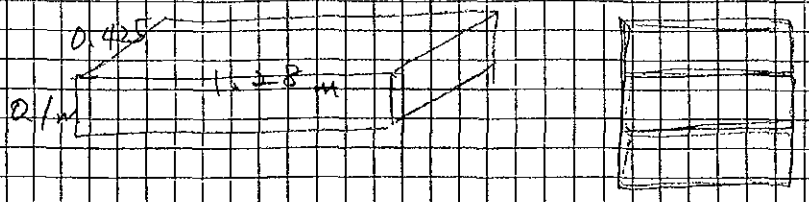| Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Manhole 1200 mm	Pay Item No. (BOQ)	2H-080603
Quantity Item	Form for concrete cover	Unit	m²

Calculation Procedure Applied

Area of form for concrete cover was computed by unit area by the number.

References, Calculation Base and Revisions

See the item of excavation and disposal of 1200mm. (2H-0801)

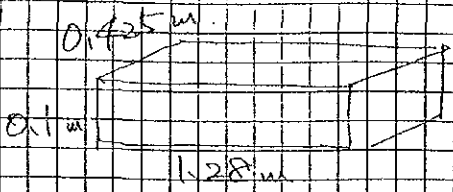| Rev	Prepared by	Date	No. of Pages	Checked by	Date	Reviewed by	Date	Superseded by Calc No.
0	Kaila Garcia			Mr. Inoma		Mr. Ando		
1								
2								
3								

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Manhole 1200mm	Calc. Index No.	
Subject	Form for concrete cover	Page No.	Rev.

References/Notes

Side

$$A_1 = (1.78 \times 2 + 0.425 \times 2) \times 0.1$$

$$= 0.168 \ m^2$$

bottom

$$A_2 = 1.78 \times 0.425 = 0.55 \ m^2$$

$$A_T = (0.168 + 0.55) \times 3 \times 34$$

$$= \boxed{73.3} \ m^2$$

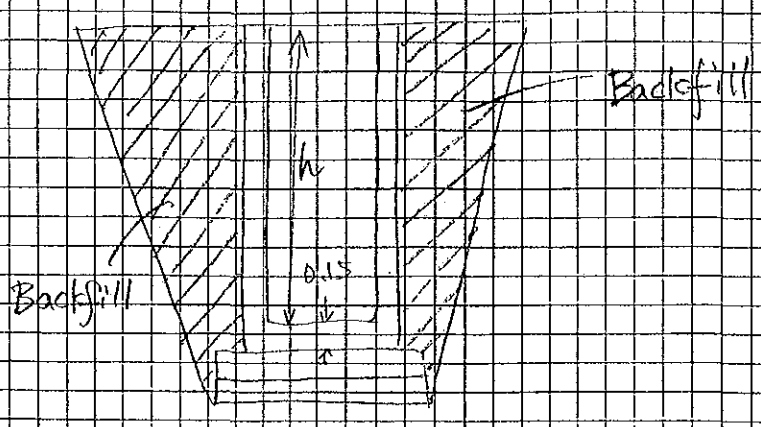| Prepared by		Checked by	
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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Manhole 1800mm	Pay Item No. (BOQ)	2H-080604
Quantity Item	Reinforcement for concrete	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 1800mm.   (2H-0201)

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

TABLE OF REINFORCEMENT (MANHOLE COVER)

No.	D	L (m)	Qty	W/bar (kg)	W (kg)	Remarks
Manhole cover (1500type)						
A1	D13	1.40	5	1.393	6.97	
A2	D13	0.40	8	0.398	3.18	
				total	10.15	1580x520x100
				total/spot	30.45	
L50x50x6		7.20			31.9	per spot
Re-bar	D9	0.10	24	0.05	1.2	per spot
Manhole cover (1200type)						
A1	D13	1.20	4	1.194	4.78	
A2	D13	0.30	7	0.2985	2.09	
				total	6.87	1280x425x100
				total/spot	20.61	
L50x50x6		6.00			26.6	per spot
Re-bar	D9	0.10	20	0.05	1.0	per spot

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Manhole 1200 mm	Calc. Index No.	
Subject	Reinforcement for concrete cover	Page No.	Rev.

References/Notes

$$W = (6.87 \times 3 + 1.0) \times 34$$

$$= \boxed{735} \ kg$$

	Prepared by		Checked by	
		/ /200		/ /200

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Manhole 1200 mm	Pay Item No. (BOQ)	ZH-080605
Quantity Item	Concrete for concrete cover	Unit	m³

Calculation Procedure Applied

Concrete volume for concrete cover was computed by multiplying unit volume by the number.

References. Calculation Base and Revisions

See the item of excavation and disposal of 1200 mm. (ZH-0801)

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

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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Manhole 1200 mm	Calc. Index No.	
Subject	Concrete for concrete cover	Page No.	Rev.

References/Notes

0.425 m

0.1 m

1.28 m

$$V_1 = 1.28 \times 0.425 \times 0.1$$

$$= 0.055 \text{ m}^3$$

$$V = 0.055 \times 3 \times 34$$

$$= \boxed{5.61} \text{ m}^3$$

		Prepared by			Checked by			
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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	Manhole 1200 mm	Pay Item No. (BOQ)	2H-080701
Quantity Item	Backfill sand	Unit	m³

Calculation Procedure Applied

Volume of backfill sand was computed by deduction of crushed stone, lean concrete and manhole from the excavation volume.

References. Calculation Base and Revisions

See the item of excavation and disposal of 1200mm.   (2H - 0801)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Koh Gorio			Hr. Inuma		Hr. Ando		
1								
2								
3								

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Manhole 1200 m·m	Calc. Index No.	
Subject	Backfill sand	Page No.	Rev.

Backfill

Backfill

Manhole

$$V_1 = 1.5 \times 1.5 \times (h + 0.15)$$

$$V_{BF} = V_{EX} - V_{cs} - V_{lc} - V_1$$

V_{BF} : Volume of backfill

V_{EX} : Volume of excavation

V_{cs} : Volume of crushed stone

V_{lc} : Volume of lean concrete

		Prepared by			Checked by			
			/	/200			/	/200

Concrete cover

		W (m)	a (m)	O.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vos (m3)	Vlo (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-1	1.2	1.9	5.522	2.444	3.478	49.6	0.55	0.37	42.4	26.7	38.47	846	3.18
2	CM-1	1.2	1.9	5.562	3.399	2.563	27.4	0.55	0.37	21.9	17.7	28.59	623	2.42
3	CM-2	1.2	1.9	5.537	3.343	2.594	28	0.55	0.37	22.4	18	28.92	631	2.44
4	CM-3	1.2	1.9	5.437	3.303	2.534	26.8	0.55	0.37	21.3	17.5	28.27	616	2.4
5	CM-4	1.2	1.9	5.437	3.229	2.608	28.3	0.55	0.37	22.7	18.1	29.07	634	2.45
6	CM-4-1	1.2	1.9	5.537	3.269	2.668	29.5	0.55	0.37	23.8	18.7	29.72	649	2.5
7	CM-5	1.2	1.9	5.637	3.189	2.848	33.4	0.55	0.37	27.3	20.3	31.66	693	2.65
8	CM-5-1	1.2	1.9	5.637	3.205	2.832	33.1	0.55	0.37	27.1	20.2	31.49	689	2.64
9	CM-6	1.2	1.9	5.637	3.055	2.982	36.5	0.55	0.37	30.2	21.6	33.11	725	2.78
10	CM-7	1.2	1.9	5.857	2.691	3.566	52.2	0.55	0.37	44.8	27.7	39.42	867	3.23
11	CM8-1	1.2	1.9	5.507	2.755	3.152	40.7	0.55	0.37	34.1	23.3	34.95	766	2.9
12	CM8-1-1	1.2	1.9	5.592	2.819	3.173	41.3	0.55	0.37	34.6	23.5	35.17	772	2.91
13	CM-8-2	1.2	1.9	5.507	2.795	3.112	39.7	0.55	0.37	33.2	22.9	34.51	757	2.86
14	CM-8-2-1	1.2	1.9	5.602	2.821	3.181	41.5	0.55	0.37	34.8	23.6	35.26	773	2.92
15	CM-8-3	1.2	1.9	5.507	2.258	3.649	54.7	0.55	0.37	47.2	26.6	40.31	887	3.3
16	CM-8-4	1.2	1.9	5.507	2.895	3.012	37.3	0.55	0.37	30.9	21.9	33.43	732	2.78
17	DM-1	1.2	1.9	6.25	4.797	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
18	DM-2	1.2	1.9	5.5	3.147	2.753	31.3	0.55	0.37	25.4	19.5	30.64	669	2.57
19	DM-3	1.2	1.9	5.2	3.045	2.555	27.2	0.55	0.37	21.7	17.6	28.5	621	2.41
20	DM-4	1.2	1.9	5.34	3.125	2.615	28.4	0.55	0.37	22.8	18.2	29.15	636	2.46
21	DM-4-1	1.2	1.9	5.34	3.047	2.693	30.1	0.55	0.37	24.3	18.9	29.99	655	2.52
22	DM-5	1.2	1.9	5.34	2.865	2.875	34.1	0.55	0.37	28	20.6	31.95	699	2.67
23	DM-5-1	1.2	1.9	5.34	2.887	2.853	33.6	0.55	0.37	27.5	20.4	31.72	694	2.65
24	DM-7-1	1.2	1.9	5.17	2.683	2.887	34.3	0.55	0.37	28.2	20.7	32.08	702	2.68
25	DM-8-1	1.2	1.9	4.625	2.7	2.325	22.9	0.55	0.37	17.8	15.7	26.01	565	2.23
26	DM-9-1	1.2	1.9	5.01	2.546	2.864	33.8	0.55	0.37	27.7	20.5	31.84	696	2.66
27	DM-9-2	1.2	1.9	5.01	2.564	2.846	33.4	0.55	0.37	27.3	20.3	31.64	692	2.65
28	EM-1	1.2	1.9	6.06	3.897	2.563	27.4	0.55	0.37	21.9	17.7	28.59	623	2.42
29	EM-2	1.2	1.9	5.97	3.799	2.571	27.6	0.55	0.37	22	17.8	28.67	625	2.43
30	EM-2-1	1.2	1.9	5.97	3.808	2.562	27.4	0.55	0.37	21.9	17.7	28.57	623	2.42
31	EM-3	1.2	1.9	5.59	3.39	2.6	28.1	0.55	0.37	22.5	18	28.98	632	2.45
32	EM-4-2	1.2	1.9	5.43	3.972	1.858	15.5	0.55	0.37	11.2	11.9	20.91	452	1.85
33	EM-4-3	1.2	1.9	6.14	4.687	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
34	EM-4-4	1.2	1.9	6.25	4.797	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
	Total						1,090	18.7	12.6	883	662	1,040	22,600	87.0

Concrete cover

		W (m)	a (m)	O.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vos (m3)	Vlo (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-2	1.5	2.2	5.522	2.406	3.516	58.8	0.73	0.49	48.1	29.5	47.5	932	3.97
2	AM-3	1.5	2.2	5.332	2.328	3.404	55.2	0.73	0.49	44.8	28.2	46.02	903	3.86
3	AM-5-1	1.5	2.2	5.132	2.158	3.374	54.2	0.73	0.49	43.8	27.9	45.62	895	3.83
4	AM-6-1	1.5	2.2	4.928	1.982	3.346	53.4	0.73	0.49	43.1	27.6	45.25	887	3.8
5	AM-6-2	1.5	2.2	4.928	2.007	3.321	52.8	0.73	0.49	42.4	27.3	44.92	881	3.78
6	AM-7-1	1.5	2.2	4.711	1.797	3.314	52.4	0.73	0.49	42.2	27.2	44.83	879	3.77
7	BM-4	1.5	2.2	4.711	1.395	3.716	65.5	0.73	0.49	54.2	31.8	50.14	985	4.17
8	BM-5-1	1.5	2.2	4.711	1.373	3.738	66.3	0.73	0.49	55	32.1	50.43	991	4.19
9	CM-11-1	1.5	2.2	5.132	2.379	3.153	47.6	0.73	0.49	37.8	25.5	42.7	836	3.61
10	CM-12-1	1.5	2.2	4.928	2.247	3.081	45.6	0.73	0.49	36	24.7	41.75	817	3.54
11	CM-13-1	1.5	2.2	4.711	1.44	3.671	64	0.73	0.49	52.8	31.3	49.54	973	4.13
12	CM-8	1.5	2.2	5.507	2.62	3.287	51.6	0.73	0.49	41.5	26.9	44.47	872	3.75
13	CM-9	1.5	2.2	5.332	2.55	3.182	48.5	0.73	0.49	38.7	25.8	43.09	844	3.64
14	DM-10	1.5	2.2	4.844	2.084	3.16	47.8	0.73	0.49	38	25.5	42.8	838	3.62
15	DM-6	1.5	2.2	4.625	2.836	2.189	24.7	0.73	0.49	17.6	16.1	29.98	581	2.66
16	DM-7	1.5	2.2	5.17	2.665	2.905	40.8	0.73	0.49	31.7	22.9	39.43	770	3.37
17	DM-8	1.5	2.2	5.119	2.519	3	43.4	0.73	0.49	34.1	23.8	40.68	795	3.46
18	DM-9	1.5	2.2	5.019	2.739	2.68	35.2	0.73	0.49	26.7	20.6	36.46	711	3.14
19	EM-4	1.5	2.2	5.33	3.114	2.616	33.7	0.73	0.49	25.4	20	35.62	694	3.08
20	EM-4-1	1.5	2.2	5.33	3.306	2.424	29.5	0.73	0.49	21.7	18.2	33.08	643	2.89
21	EM-5	1.5	2.2	5.22	2.979	2.641	34.3	0.73	0.49	25.9	20.2	35.95	700	3.11
22	EM-5-1	1.5	2.2	5.22	3.001	2.619	33.8	0.73	0.49	25.5	20	35.66	695	3.08
23	EM-5-2	1.5	2.2	5.22	3.011	2.609	33.6	0.73	0.49	25.3	19.9	35.52	692	3.07
24	EM-6	1.5	2.2	4.89	2.669	2.621	33.9	0.73	0.49	25.6	20.1	35.68	695	3.09
	Total						1,110	17.6	11.8	880	600	1,000	19,600	85

Grating cover

		W (m)	a (m)	O.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vos (m3)	Vlo (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-4	1.5	2.2	5.332	2.28	3.452	56.7	0.73	0.49	46.1	28.8	46.65	915	3.91
2	AM-5	1.5	2.2	5.132	2.109	3.423	55.8	0.73	0.49	45.3	28.4	46.27	908	3.88
3	AM-6	1.5	2.2	4.928	1.934	3.394	54.9	0.73	0.49	44.5	28.1	45.89	900	3.85
4	BM-1	1.5	2.2	5.332	1.881	3.851	70.4	0.73	0.49	58.7	33.4	51.92	1021	4.3
5	BM-1-1	1.5	2.2	5.332	1.929	3.803	68.8	0.73	0.49	57.1	32.8	51.28	1008	4.26
6	BM-2	1.5	2.2	5.132	1.71	3.822	69.3	0.73	0.49	57.7	33.1	51.54	1013	4.27
7	BM-2-1	1.5	2.2	5.132	1.758	3.774	67.6	0.73	0.49	56.2	32.5	50.9	1001	4.23
8	BM-3	1.5	2.2	4.928	1.534	3.794	68.3	0.73	0.49	56.8	32.7	51.17	1006	4.25
9	BM-3-1	1.5	2.2	4.928	1.582	3.746	66.6	0.73	0.49	55.2	32.2	50.53	993	4.2
10	CM-10	1.5	2.2	5.332	2.502	3.23	49.9	0.73	0.49	39.9	26.3	43.72	856	3.69
11	CM-11	1.5	2.2	5.132	2.331	3.201	49	0.73	0.49	39.1	26	43.34	849	3.66
12	CM-12	1.5	2.2	4.928	2.199	3.129	46.9	0.73	0.49	37.2	25.2	42.39	830	3.59
	Total						730	8.8	5.9	600	360	576	11,300	49

To oil separator

		W (m)	a (m)	O.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vos (m3)	Vlo (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-7	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
2	BM-5	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
3	CM-13	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
4	DM-11	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
	Total						380	4.4	3.0	273	167	296	6,020	38

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Manhole 1200 mm	Pay Item No. (BOQ)	2H-080702
Quantity Item	Compaction	Unit	m²

Calculation Procedure Applied

Compaction area was to be the surface of excavation area.

References, Calculation Base and Revisions

See the item of excavation and disposal of 1200 mm. (2H-0801)

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

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Manhole 1200 mm	Calc. Index No.	
Subject	Compaction	Page No.	Rev.

Compaction area

$a + h + 0.4\,m$ Compaction area

$h + 0.4\,m$

$a\,m$

$$A = (a + h + 0.4)^2 - 1.5^2$$

Prepared by				Checked by		
			/ /200			/ /200

Concrete cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlc (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-1	1.2	1.9	5.522	2.444	3.478	49.6	0.55	0.37	42.4	26.7	38.47	846	3.16
2	CM-1	1.2	1.9	5.562	3.399	2.563	27.4	0.55	0.37	21.9	17.7	28.59	623	2.42
3	CM-2	1.2	1.9	5.537	3.343	2.594	28	0.55	0.37	22.4	18	28.92	631	2.44
4	CM-3	1.2	1.9	5.437	3.303	2.534	26.8	0.55	0.37	21.3	17.5	28.27	616	2.4
5	CM-4	1.2	1.9	5.437	3.229	2.608	28.3	0.55	0.37	22.7	18.1	29.07	634	2.45
6	CM-4-1	1.2	1.9	5.537	3.269	2.668	29.5	0.55	0.37	23.8	18.7	29.72	649	2.5
7	CM-5	1.2	1.9	5.637	3.189	2.848	33.4	0.55	0.37	27.3	20.3	31.66	693	2.65
8	CM-5-1	1.2	1.9	5.637	3.205	2.832	33.1	0.55	0.37	27.1	20.2	31.49	689	2.64
9	CM-6	1.2	1.9	5.637	3.055	2.982	36.5	0.55	0.37	30.2	21.6	33.11	725	2.76
10	CM-7	1.2	1.9	5.857	2.691	3.566	52.2	0.55	0.37	44.8	27.7	39.42	867	3.23
11	CM8-1	1.2	1.9	5.507	2.755	3.152	40.7	0.55	0.37	34.1	23.3	34.95	766	2.9
12	CM8-1-1	1.2	1.9	5.592	2.819	3.173	41.3	0.55	0.37	34.6	23.5	35.17	772	2.91
13	CM-8-2	1.2	1.9	5.507	2.795	3.112	39.7	0.55	0.37	33.2	22.9	34.51	757	2.86
14	CM-8-2-1	1.2	1.9	5.602	2.821	3.181	41.5	0.55	0.37	34.8	23.6	35.26	773	2.92
15	CM-8-3	1.2	1.9	5.507	2.258	3.649	54.7	0.55	0.37	47.2	28.6	40.31	887	3.3
16	CM-8-4	1.2	1.9	5.507	2.895	3.012	37.3	0.55	0.37	30.9	21.8	33.43	732	2.78
17	DM-1	1.2	1.9	6.25	4.797	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
18	DM-2	1.2	1.9	5.5	3.147	2.753	31.3	0.55	0.37	25.4	19.5	30.64	669	2.57
19	DM-3	1.2	1.9	5.2	3.045	2.555	27.2	0.55	0.37	21.7	17.6	28.5	621	2.41
20	DM-4	1.2	1.9	5.34	3.125	2.615	28.4	0.55	0.37	22.8	18.2	29.15	638	2.46
21	DM-4-1	1.2	1.9	5.34	3.047	2.693	30.1	0.55	0.37	24.3	18.9	29.99	655	2.52
22	DM-5	1.2	1.9	5.34	2.865	2.875	34.1	0.55	0.37	28	20.6	31.95	699	2.67
23	DM-5-1	1.2	1.9	5.34	2.887	2.853	33.6	0.55	0.37	27.5	20.4	31.72	694	2.65
24	DM-7-1	1.2	1.9	5.17	2.683	2.887	34.3	0.55	0.37	28.2	20.7	32.08	702	2.68
25	DM-8-1	1.2	1.9	4.625	2.7	2.325	22.9	0.55	0.37	17.8	15.7	26.01	565	2.23
26	DM-9-1	1.2	1.9	5.01	2.546	2.864	33.8	0.55	0.37	27.7	20.5	31.84	696	2.66
27	DM-9-2	1.2	1.9	5.01	2.564	2.846	33.4	0.55	0.37	27.3	20.3	31.64	692	2.65
28	EM-1	1.2	1.9	6.06	3.897	2.583	27.4	0.55	0.37	21.9	17.7	28.59	623	2.42
29	EM-2	1.2	1.9	5.97	3.799	2.571	27.6	0.55	0.37	22	17.8	28.67	625	2.43
30	EM-2-1	1.2	1.9	5.97	3.808	2.562	27.4	0.55	0.37	21.9	17.7	28.57	623	2.42
31	EM-3	1.2	1.9	5.59	3.39	2.6	28.1	0.55	0.37	22.5	18	28.98	632	2.45
32	EM-4-2	1.2	1.9	5.43	3.972	1.858	15.5	0.55	0.37	11.2	11.9	20.97	452	1.85
33	EM-4-3	1.2	1.9	6.14	4.687	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
34	EM-4-4	1.2	1.9	6.25	4.797	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
	Total						1,090	18.7	12.6	883	662	1,040	22,600	87.0

Concrete cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlc (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-2	1.5	2.2	5.522	2.406	3.516	58.8	0.73	0.49	48.1	29.5	47.5	932	3.97
2	AM-3	1.5	2.2	5.332	2.328	3.404	55.2	0.73	0.49	44.8	28.2	46.02	903	3.86
3	AM-5-1	1.5	2.2	5.132	2.158	3.374	54.2	0.73	0.49	43.8	27.9	45.62	895	3.83
4	AM-6-1	1.5	2.2	4.928	1.982	3.346	53.4	0.73	0.49	43.1	27.6	45.25	887	3.8
5	AM-6-2	1.5	2.2	4.928	2.007	3.321	52.6	0.73	0.49	42.4	27.3	44.92	881	3.78
6	AM-7-1	1.5	2.2	4.711	1.797	3.314	52.4	0.73	0.49	42.2	27.2	44.83	879	3.77
7	BM-4	1.5	2.2	4.711	1.395	3.716	65.5	0.73	0.49	54.2	31.8	50.14	985	4.17
8	BM-5-1	1.5	2.2	4.711	1.373	3.738	66.3	0.73	0.49	55	32.1	50.43	991	4.19
9	CM-11-1	1.5	2.2	5.132	2.379	3.153	47.6	0.73	0.49	37.8	25.5	42.7	836	3.61
10	CM-12-1	1.5	2.2	4.928	2.247	3.081	45.6	0.73	0.49	36	24.7	41.75	817	3.54
11	CM-13-1	1.5	2.2	4.711	1.44	3.671	64	0.73	0.49	52.8	31.3	49.54	973	4.13
12	CM-8	1.5	2.2	5.507	2.62	3.287	51.6	0.73	0.49	41.5	26.9	44.47	872	3.75
13	CM-9	1.5	2.2	5.332	2.55	3.182	48.5	0.73	0.49	38.7	25.8	43.09	844	3.64
14	DM-10	1.5	2.2	4.844	2.084	3.16	47.8	0.73	0.49	38	25.5	42.8	838	3.62
15	DM-6	1.5	2.2	4.625	2.836	2.189	24.7	0.73	0.49	17.6	16.1	29.98	581	2.66
16	DM-7	1.5	2.2	5.17	2.665	2.905	40.8	0.73	0.49	31.7	22.9	39.43	770	3.37
17	DM-8	1.5	2.2	5.119	2.519	3	43.4	0.73	0.49	34.1	23.8	40.68	795	3.46
18	DM-9	1.5	2.2	5.019	2.739	2.68	35.2	0.73	0.49	26.7	20.6	36.46	711	3.14
19	EM-4	1.5	2.2	5.33	3.114	2.616	33.7	0.73	0.49	25.4	20	35.62	694	3.08
20	EM-4-1	1.5	2.2	5.33	3.306	2.424	29.5	0.73	0.49	21.7	18.2	33.08	643	2.89
21	EM-5	1.5	2.2	5.22	2.979	2.641	34.3	0.73	0.49	25.9	20.2	35.95	700	3.11
22	EM-5-1	1.5	2.2	5.22	3.001	2.619	33.8	0.73	0.49	25.5	20	35.66	695	3.08
23	EM-5-2	1.5	2.2	5.22	3.011	2.609	33.6	0.73	0.49	25.3	19.9	35.52	692	3.07
24	EM-6	1.5	2.2	4.89	2.669	2.621	33.9	0.73	0.49	25.6	20.1	35.68	695	3.09
	Total						1,110	17.6	11.8	880	600	1,000	19,600	85

Grating cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlc (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-4	1.5	2.2	5.332	2.28	3.452	56.7	0.73	0.49	46.1	28.8	46.65	915	3.91
2	AM-5	1.5	2.2	5.132	2.109	3.423	55.8	0.73	0.49	45.3	28.4	46.27	908	3.88
3	AM-6	1.5	2.2	4.928	1.934	3.394	54.9	0.73	0.49	44.5	28.1	45.89	900	3.85
4	BM-1	1.5	2.2	5.332	1.881	3.851	70.4	0.73	0.49	58.7	33.4	51.92	1021	4.3
5	BM-1-1	1.5	2.2	5.332	1.929	3.803	68.6	0.73	0.49	57.1	32.8	51.28	1008	4.26
6	BM-2	1.5	2.2	5.132	1.71	3.822	69.3	0.73	0.49	57.7	33.1	51.54	1013	4.27
7	BM-2-1	1.5	2.2	5.132	1.758	3.774	67.6	0.73	0.49	56.2	32.5	50.9	1001	4.23
8	BM-3	1.5	2.2	4.928	1.534	3.794	68.3	0.73	0.49	56.8	32.7	51.17	1006	4.25
9	BM-3-1	1.5	2.2	4.928	1.582	3.746	66.6	0.73	0.49	55.2	32.2	50.53	993	4.2
10	CM-10	1.5	2.2	5.332	2.502	3.23	49.9	0.73	0.49	39.9	26.3	43.72	856	3.69
11	CM-11	1.5	2.2	5.132	2.331	3.201	49	0.73	0.49	39.1	26	43.34	849	3.66
12	CM-12	1.5	2.2	4.928	2.199	3.129	46.9	0.73	0.49	37.2	25.2	42.39	830	3.59
	Total						730	8.8	5.9	600	360	576	11,300	49

To oil separator

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	Vlc (m3)	Vbf (m3)	Cmpct (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-7	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
2	BM-5	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
3	CM-13	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
4	DM-11	1.5	2.2	4.711	0.993	4.118	93.4	1.09	0.73	68.2	41.7	73.89	1504	9.30
	Total						380	4.4	3.0	273	167	296	6,020	38