QUANTITY CALCULATION COVER SHEET
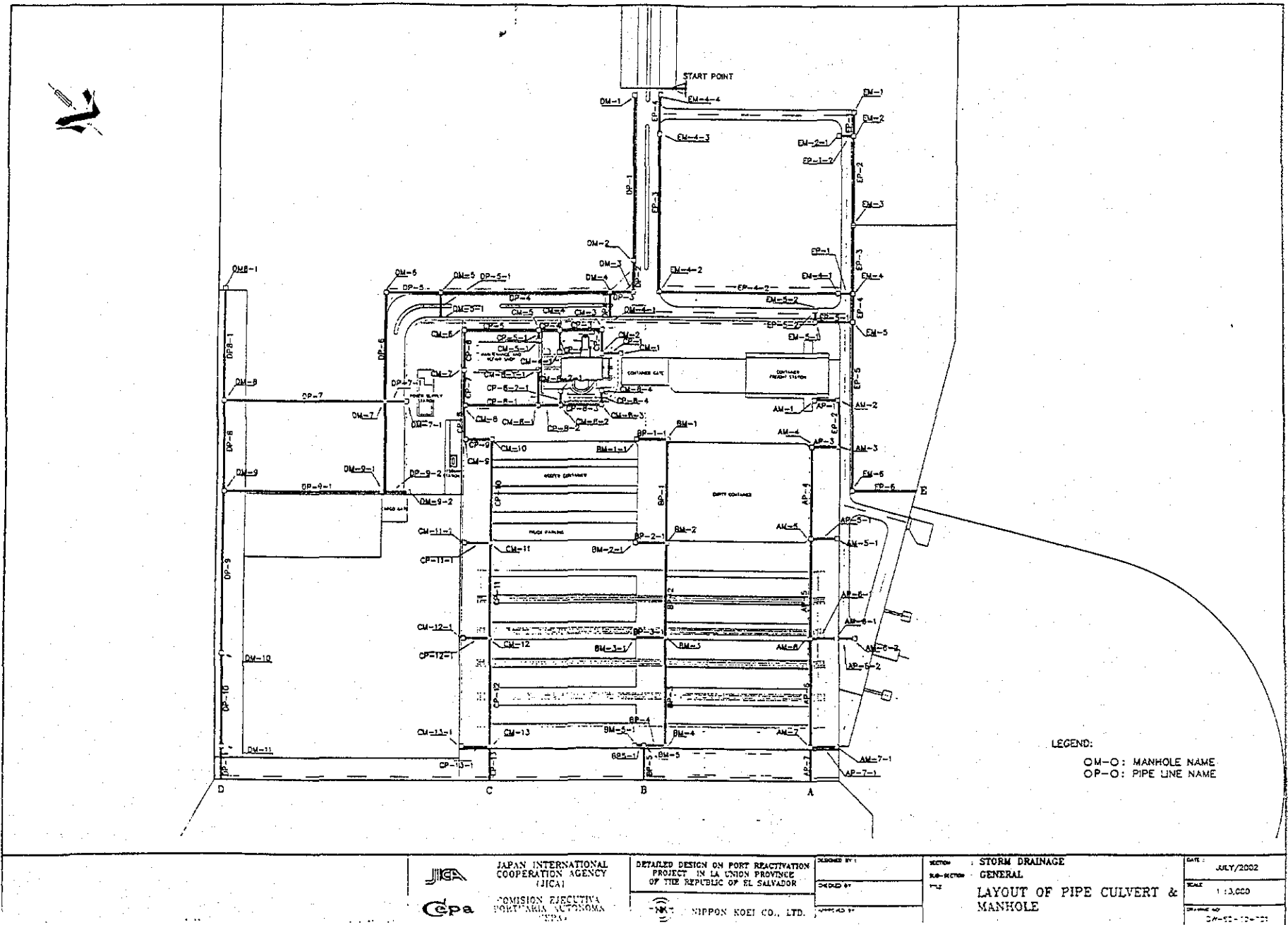
Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Manhole 1500mm concrete	Pay Item No. (BOQ)	2H-0901
Quantity Item	Excaivation and Disposal	Unit	m³

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 − 010

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.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

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

START POINT

STEEL GRATING COVER OR CONCRETE COVER

R.C. TRENCH

150 1500 150

100 100 SEE DETAIL (A) GROUND ELEVATION

300

FLOW

CRUSHED ROCK

C C

H

BOTTOM ELEVATION

LEAN CONCRETE

200 1500 200
150 150

CRUSHED ROCK

CONCRETE

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

1800
800 800
1500

D9
L=650

D13 Ø 150

D13 Ø 150
D13 Ø 150
D13 Ø 150

D13 Ø 150

400 400

D13 Ø 100
D13 Ø 400 D13 Ø 400
D13 Ø 400 D13 Ø 100

REINFORCEMENT

D16MM
L=1750

1500

SEE DETAIL (A)

D25
L=1750

D13

D13

400

D13 Ø 100
D13 Ø 400

400

D13 Ø 400
D13 Ø 100

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

2L50X50X6
150
50 100

100

D9X100Ø300
ANCHORAGE BAR

DETAIL (A)
SCALE 1:10

D13 Ø 200
1580 D13 Ø 100

520 60

90
20X40mm
LIFTING HOLES

DETAILS OF CONCRETE COVER FOR MANHOLE
SCALE 1:25

1594

50 50

12x50mm

795

12x50mm

DETAILS OF STEEL GRATING COVER FOR MANHOLE
SCALE 1:25

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Manhole 1500mm concrete cover	Calc. Index No.	
Subject	Excavation and Disposal	Page No.	Rev.

References/ Notes

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

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

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

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	848	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	17.6	28.27	618	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	3.18	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	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	1.6	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	3.011	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

QUANTITY CALCULATION COVER SHEET

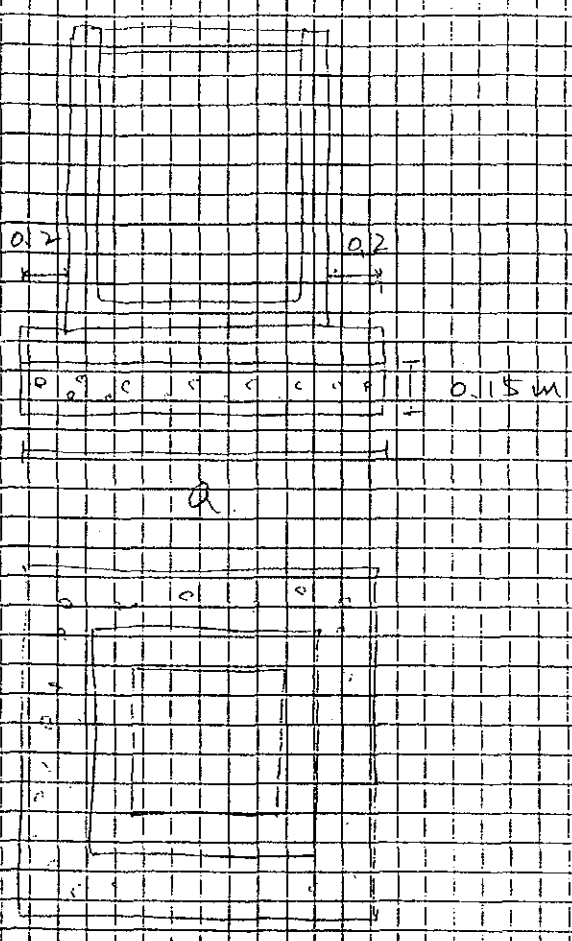| Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Manhole 1500mm concrete	Pay Item No. (BOQ)	2H-0902
Quantity Item	Crushed stone	Unit	m³

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 1500mm.

(2H - 0901)

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

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Manhole 1500mm concrete cover	Calc. Index No.	
Subject	Crushed stone	Page No.	Rev.

References/Notes

0.2   0.2

0.3   0.15 m

a

$V = 0.15 a^2$

	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)	Ompot (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	2.688	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	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	2.563	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)	Ompot (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	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	35.68	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)	Ompot (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	2.105	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)	Ompot (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 1500mm concrete	Pay Item No. (BOQ)	2H-0903
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

1500 mm   (2H-0901).

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 1500 mm concrete cover	Calc. Index No.	
Subject	Lean concrete	Page No.	Rev.

0.2   0.2 m

I 0.1 m.

a

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

		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	36.47	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	3.289	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	887	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	17.6	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	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)	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	1008	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	578	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 1500mm concrete	Pay Item No. (BOQ)	2H-0904
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 1500mm. (2H-0901)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Koila Garcia			Hr. 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)	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	2.88
14	CM-8-2-1	1.2	1.9	5.602	2.821	3.181	41.5	0.55	0.37	34.8	23.8	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	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	2.563	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	27.8	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	5.132	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	2.865	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	35.82	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	2.621	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

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Manhole 1500mm concrete	Pay Item No. (BOQ)	2H-0905
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 1500 mm.   (2H-0901)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Garcia			Hr. 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 1500mm concrete	Pay Item No. (BOQ)	2H-090601
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 1500mm

(2H - 0901)

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

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Manhole 1500mm concrete cover	Calc. Index No.	
Subject	Form for Manhole	Page No.	Rev.

$$A = 1.8 \times (h + 0.15) \times 4 + 1.15 \times 4 \times 4$$

		Prepared by			Checked by		
			/	/200		/	/200

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	831	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	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	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	35.28	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	2.582	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	44.63	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	45.8	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	2.865	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	2.821	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)	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	67.8	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	46.8	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 1500mm concrete	Pay Item No. (BOQ)	2H-090602
Quantity Item	Concrete for manhole	Unit	m^3

Calculation Procedure Applied

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

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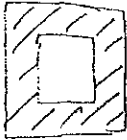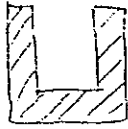
Top view   side view

References, Calculation Base and Revisions

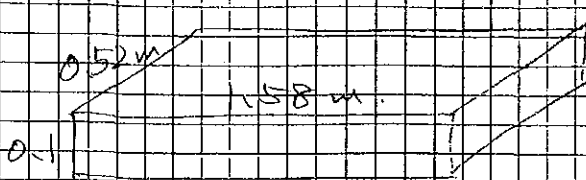See the item of excavation and disposal of 1500 mm. (2H-0901)

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

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Manhole 1500mm concrete cover	Calc. Index No.	
Subject	Concrete for manhole	Page No.	Rev.

0.15m   0.15m

h

1.5m

0.15m

0.15m

1.5m   1.8m

0.15m

$$V = 1.8 \times 1.8 \times (h + 0.15) + 1.5 \times 1.5 \times h$$

		Prepared by			Checked by		
			/	/200		/	/200

Concrete cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vos (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	3.289	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	34.8	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)	Vos (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	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	25.8	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)	Vos (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)	Vos (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 1500mm concrete	Pay Item No. (BOQ)	2H - 090603
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 1500 mm.

(2H - 0901)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Halla Gorda			Mr. Touma		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	Manhole 1500mm concrete cover		Calc. Index No.	
Subject	Form for concrete cover		Page No.	Rev.

Side

$$A_1 = (1.58 \times 2 + 0.52 \times 2) \times 0.1$$

$$= 0.42 \, m^2$$

bottom

$$A_2 = 1.58 \times 0.52 = 0.83 \, m^2$$

$$A_T = (0.42 + 0.83) \times 3 \times 24$$

$$= \boxed{90.1 \, m^2}$$

		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 1500mm concrete	Pay Item No. (BOQ)	2H-090604
Quantity Item	Reinforcement for concrete	Unit	kg

Calculation Procedure Applied   Cover

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 1500 mm.   (2H - 0901.)

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

TABLE OF REINFORCEMENT (MANHOLE COVER)
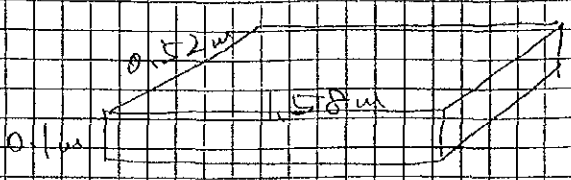
No.	D	L (m)	Qty	W/bar (kg)	W (kg)	Remarks
Manhole cover (1500type)						
A1	D13	1.40	5	1.393	6.97	
A2	D13	0.40	8	0.398	3.18	
				total	10.15	1580x520x100
				total/spot	30.45	
L50x50x6		7.20			31.9	per spot
Re-bar	D9	0.10	24	0.05	1.2	per spot
Manhole cover (1200type)						
A1	D13	1.20	4	1.194	4.78	
A2	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 1500mm concrete cover	Calc. Index No.	
Subject	Reinforcement for cover concrete.	Page No.	Rev.

References/Notes

$$W = (10.15 \times 3 + 1.2) \times 24$$

$$= 759.6$$

$$= \boxed{760} \, kg$$

		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 1500mm concrete	Pay Item No. (BOQ)	2H-090605
Quantity Item	Concrete for concrete cover	Unit	m^3

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 1500mm. (2H-0901).

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

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Manhole 1500mm concrete cover	Calc. Index No.	
Subject	Concrete for concrete cover	Page No.	Rev.

References/Notes

$$V_1 = 1.58 \times 0.52 \times 0.1$$

$$= 0.083 \ m^2$$

$$V = 0.083 \times 3 \times 24$$

$$= \boxed{6.0} \ m^3$$

		Prepared by			Checked by		
				/ /200			/ /200

FN: Calculation_Sheet

QUANTITY CALCULATION COVER SHEET

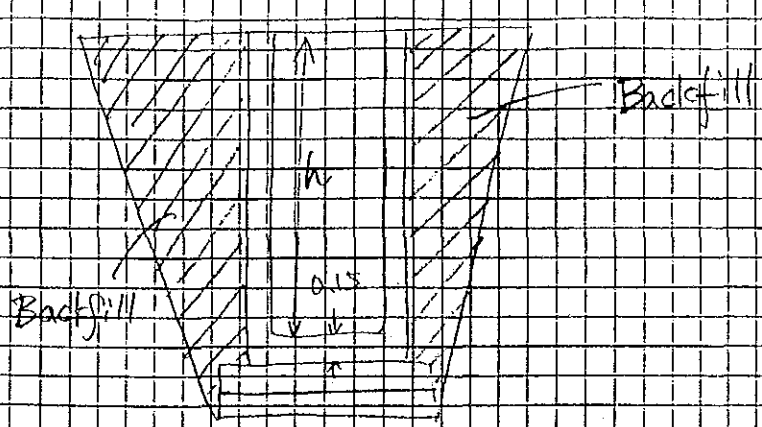| Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Manhole 1500mm concrete	Pay Item No. (BOQ)	2H-070701
Quantity Item	Backfill sand	Unit	m³

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 1500mm. (2H-0901)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Kaila Garcia			Mr. Truong		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	Manhole 1500mm concrete cover	Calc. Index No.	
Subject	Backfill sand	Page No.	Rev.

Manhole

$$V_1 = 1.8 \times 1.8 \times (h + 0.15)$$

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

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)	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	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	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	2.808	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	33.3	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	887	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	35.28	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)	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	41.6	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	35.86	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	800	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	3.822	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 1500mm concrete	Pay Item No. (BOQ)	2H-090702
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 1500 mm.   (2H - 0901).

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								

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Manhole 1500mm concrete cover	Calc. Index No.	
Subject	Compaction	Page No.	Rev.

References/Notes

Compaction area

$a + h + 0.4$ m — Compaction area

$h + 0.4$ m

a m

$$A = (a + h + 0.4)^2 - 1.8^2$$

	Prepared by			Checked by		
		/	/200		/	/200

Concrete cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	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	2.76
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	887	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	2.326	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	1.34	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)	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	578	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 1500mm grating	Pay Item No. (BOQ)	2H-1001
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

See the item of excavation and disposal

of 1500mm concrete cover.　　　(2H-0901)

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

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Manhole 1500mm grating cover	Calc. Index No.	
Subject	Excavation and Disposal	Page No.	Rev.

References/Notes

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

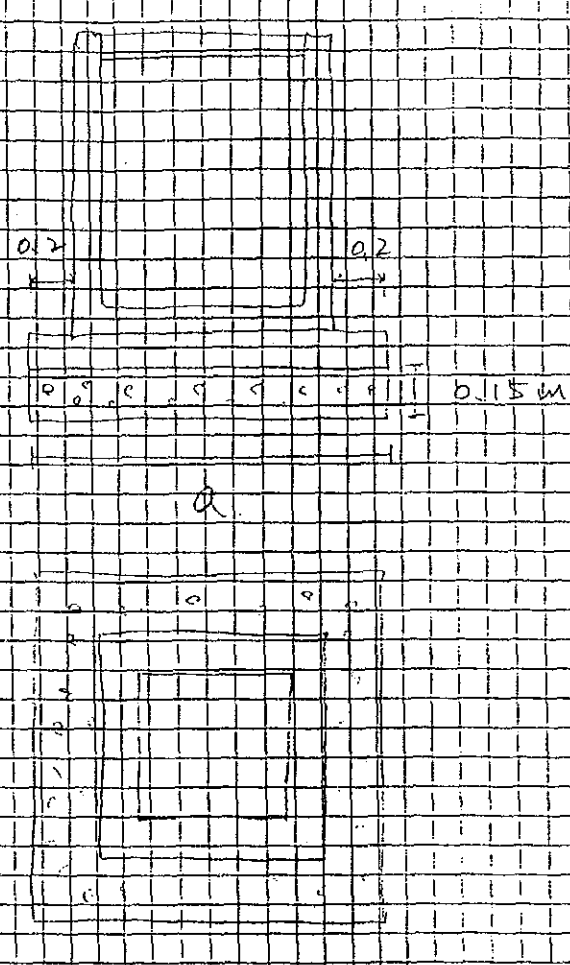$$= \frac{1}{3}(3a^2h + 3ah^2 + h^3)$$

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

		Prepared by			Checked by			
			/	/200			/	/200

Concrete cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vos (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	5.582	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	CMB-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	CMB-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	689	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)	Vos (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)	Vos (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)	Vos (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 1500mm grating	Pay Item No. (BOQ)	2H-1002
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 1500mm concrete cover. (2H-0901)

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

Project	Detailed Design on Port Reactivation Project In La Union	Calc. File No.	
Section	Manhole 1500mm grating cover	Calc. Index No.	
Subject	Crushed stone	Page No.	Rev.

References/ Notes

0.2   0.2

0.9 c   c   c   c   c   c   0.15 m

a

c   c

$$V = 0.15 a^2$$

		Prepared by			Checked by		
				/ /200		/	/200

Concrete cover

		W (m)	a (m)	G.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	39.47	848	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	3.289	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	34.85	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	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	2.563	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)	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	52.6	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	2.247	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)	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	68.6	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	858	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)	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 1500mm grating	Pay Item No. (BOQ)	2H - 1003
Quantity Item	Lean concrete	Unit	m^3.

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 1500 mm concrete cover.

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

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Manhole 1500mm grating cover	Calc. Index No.	
Subject	Lean concrete	Page No.	Rev.

References/Notes

0.2

0.2 m

I 0.1 m.

a

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

		Prepared by		Checked by	
			/ /200		/ /200

FN: Calculation_Sheet

Manhole 1500mm grating cover

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	28.7	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	6.507	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	6.33	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

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	Manhole 1500mm grating	**Pay Item No. (BOQ)**	2H-1004
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 1500 mm concrete cover. (2H-0901)

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 (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)	Q.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	2.76
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	887	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	2.815	28.4	0.55	0.37	22.8	18.2	29.15	636	2.48
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	585	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)	Q.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	5.607	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	35.86	695	3.08
23	EM-5-2	1.5	2.2	5.22	3.011	2.609	33.8	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)	Q.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	4.28
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)	Q.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