

## QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Manhole 1500 mm grating	Pay Item No. (BOQ)	2H-1005
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 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Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.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								

QUANTITY CALCULATION COVER SHEET								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>	JC1N004/2N001			
<b>Work Section Title</b>	Manhole 1500mm grating			<b>Pay Item No. (BOQ)</b>	2H-100601			
<b>Quantity Item</b>	Form for Manhole			<b>Unit</b>	m <sup>2</sup>			
<b>Calculation Procedure Applied</b>  <div style="font-family: cursive; padding: 10px;"> Area of form for manhole was computed by combining inside with outside. </div>								
<b>References, Calculation Base and Revisions</b>  <div style="font-family: cursive; padding: 10px;"> See the item of excavation and disposal of 1500mm concrete cover. (2H-2901) </div>								
Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
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1								
2								
3								

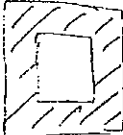
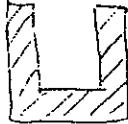
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
<b>Section</b>	Manhole	Calc. Index No.	
<b>Subject</b>	Form for Manhole	Page No.	Rev.

$$A = 1.8 \times (h + 0.15) \times 4 + 1.5 \times h \times 4$$

	<b>Prepared by</b>		<b>Checked by</b>
		/ /200	/ /200

## Concrete cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m <sup>3</sup> )	Vcs (m <sup>3</sup> )	Vic (m <sup>3</sup> )	Vbf (m <sup>3</sup> )	Ompet (m <sup>2</sup> )	Form (m <sup>2</sup> )	Re-bar (kg)	Concrete (m <sup>3</sup> )
1	AM-1	1.2	1.9	5.522	2.444	3.478	49.6	0.55	0.37	42.4	26.7	38.47	846	3.18
2	CM-1	1.2	1.9	5.562	3.399	2.563	27.4	0.55	0.37	21.9	17.7	28.59	623	2.42
3	CM-2	1.2	1.9	5.537	3.343	2.594	28	0.55	0.37	22.4	18	28.92	631	2.44
4	CM-3	1.2	1.9	5.437	3.303	2.534	26.8	0.55	0.37	21.3	17.5	28.27	616	2.4
5	CM-4	1.2	1.9	5.437	3.229	2.608	28.3	0.55	0.37	22.7	18.1	29.07	634	2.45
6	CM-4-1	1.2	1.9	5.537	3.289	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	34.95	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	28.8	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	2.893	30.1	0.55	0.37	24.3	18.9	29.99	655	2.52
22	DM-5	1.2	1.9	5.34	2.865	2.875	34.1	0.55	0.37	28	20.6	31.95	699	2.67
23	DM-5-1	1.2	1.9	5.34	2.887	2.853	33.6	0.55	0.37	27.5	20.4	31.72	694	2.65
24	DM-7-1	1.2	1.9	5.17	2.683	2.887	34.3	0.55	0.37	28.2	20.7	32.08	702	2.68
25	DM-8-1	1.2	1.9	4.625	2.7	2.325	22.9	0.55	0.37	17.8	15.7	26.01	565	2.23
26	DM-9-1	1.2	1.9	5.01	2.546	2.864	33.8	0.55	0.37	27.7	20.5	31.84	696	2.66
27	DM-9-2	1.2	1.9	5.01	2.564	2.846	33.4	0.55	0.37	27.3	20.3	31.64	692	2.65
28	EM-1	1.2	1.9	6.06	3.897	2.583	27.4	0.55	0.37	21.9	17.7	28.59	623	2.42
29	EM-2	1.2	1.9	5.97	3.799	2.571	27.6	0.55	0.37	22	17.8	28.67	625	2.43
30	EM-2-1	1.2	1.9	5.97	3.808	2.562	27.4	0.55	0.37	21.9	17.7	28.57	623	2.42
31	EM-3	1.2	1.9	5.59	3.39	2.6	28.1	0.55	0.37	22.5	18	28.98	632	2.45
32	EM-4-2	1.2	1.9	5.43	3.972	1.858	15.5	0.55	0.37	11.2	11.9	20.97	452	1.85
33	EM-4-3	1.2	1.9	6.14	4.687	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
34	EM-4-4	1.2	1.9	6.25	4.797	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
Total							1,090	18.7	12.6	883	662	1,040	22,600	87.0
Concrete cover														
1	AM-2	1.5	2.2	5.522	2.406	3.516	58.8	0.73	0.49	48.1	29.5	47.5	932	3.97
2	AM-3	1.5	2.2	5.332	2.328	3.404	55.2	0.73	0.49	44.8	28.2	46.02	903	3.86
3	AM-5-1	1.5	2.2	5.132	2.158	3.374	54.2	0.73	0.49	43.8	27.9	45.62	895	3.83
4	AM-6-1	1.5	2.2	4.928	1.982	3.346	53.4	0.73	0.49	43.1	27.6	45.25	887	3.8
5	AM-6-2	1.5	2.2	4.928	2.007	3.321	52.8	0.73	0.49	42.4	27.3	44.92	881	3.78
6	AM-7-1	1.5	2.2	4.711	1.797	3.314	52.4	0.73	0.49	42.2	27.2	44.83	879	3.77
7	BM-4	1.5	2.2	4.711	1.395	3.718	65.5	0.73	0.49	54.2	31.8	50.14	965	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	2.865	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	2.621	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														
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														
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								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>	JC1N004/2N001			
<b>Work Section Title</b>	Manhole 1500mm grating			<b>Pay Item No. (BOQ)</b>	2H-100602			
<b>Quantity Item</b>	Concrete for manhole			<b>Unit</b>	m <sup>3</sup>			
<b>Calculation Procedure Applied</b>								
<p>Height = Ground Level - Bottom Level + 0.15 (m)</p> <p>Volume of concrete for manhole was computed by outer volume minus inner volume.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end; margin-top: 20px;"> <div style="text-align: center;">  <p>Top view</p> </div> <div style="text-align: center;">  <p>side view</p> </div> </div>								
<b>References, Calculation Base and Revisions</b>								
<p>See the item of excavation and disposal of 1500 mm concrete cover. (2H-0901)</p>								
<b>Rev</b>	<b>Prepared</b>		<b>No. of Pages</b>	<b>Checked</b>		<b>Reviewed</b>		<b>Superseded by Calc No.</b>
	by	Date		by	Date	by	Date	
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<b>Project</b>	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
<b>Section</b>	Manhole 1500 mm grating cover	Calc. Index No.	
<b>Subject</b>	Concrete for manhole	Page No.	Rev.
		References/ Notes	
$V = 1.8 \times 1.8 \times (h + 0.15) + 1.5 \times 1.5 \times h$			
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Concrete cover

		W (m)	a (m)	GL (m)	B.L (m)	h (m)	Vex (m3)	Vos (m3)	Vlc (m3)	Vof (m3)	Empet (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	823	2.42
3	CM-2	1.2	1.9	5.537	3.343	2.594	28	0.55	0.37	22.4	18	28.92	831	2.44
4	CM-3	1.2	1.9	5.437	3.303	2.534	26.8	0.55	0.37	21.3	17.5	28.27	816	2.4
5	CM-4	1.2	1.9	5.437	3.229	2.808	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	2.688	29.5	0.55	0.37	23.8	18.7	29.72	849	2.5
7	CM-5	1.2	1.9	5.637	3.189	2.848	33.4	0.55	0.37	27.3	20.3	31.66	893	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	889	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	925	2.76
10	CM-7	1.2	1.9	5.857	2.891	3.568	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	786	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	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	2.883	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	4.825	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	2.68
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	823	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	825	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	823	2.42
31	EM-3	1.2	1.9	5.59	3.39	2.6	28.1	0.55	0.37	22.5	18	28.98	632	2.45
32	EM-4-2	1.2	1.9	5.43	3.972	1.858	15.5	0.55	0.37	11.2	11.9	20.97	452	1.85
33	EM-4-3	1.2	1.9	6.14	4.887	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
34	EM-4-4	1.2	1.9	6.25	4.797	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
Total							1,090	18.7	12.8	883	662	1,040	22,600	87.0

Concrete cover

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	28.9	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	4.825	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	28.7	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	2.841	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	2.819	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

1	AM-4	1.5	2.2	5.332	2.28	3.452	58.7	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	28.3	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

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-100603
Quantity Item	grating cover	Unit	Nos

**Calculation Procedure Applied**

Grating cover was computed.

**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								



<b>Project</b>	Detailed Design on Port Reactivation Project in La Union	<b>Calc. File No.</b>	
<b>Section</b>	Manhole 1500mm grating	<b>Calc. Index No.</b>	
<b>Subject</b>	grating cover	<b>Page No.</b>	<b>Rev.</b>

$N = 12 \times 2 = 24$	<b>References/ Notes</b>
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<b>Prepared by</b>		<b>Checked by</b>	
	/ /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 grating	Pay Item No. (BOQ)	2H-100701
Quantity Item	Backfill sand	Unit	m <sup>3</sup>

#### 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 concrete cover. (2H-0701)

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

<b>Project</b>	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
<b>Section</b>	Manhole 1500 mm grating cover	Calc. Index No.	
<b>Subject</b>	Backfill sand	Page No.	Rev.
		References/ Notes	
<p>Manhole</p> <p><math>V_1 = 1.8 \times 1.8 \times (1.15)</math></p> <p><math>V_{BF} = V_{EX} - V_{CS} - V_{LC} - V_{H}</math></p> <p><math>V_{BF}</math> : Volume of backfill</p> <p><math>V_{EX}</math> : Volume of excavation</p> <p><math>V_{CS}</math> : Volume of crushed stone</p> <p><math>V_{LC}</math> : Volume of lean concrete</p>			
Prepared by		Checked by	
/ /200		/ /200	

## Concrete cover

		W (m)	a (m)	GL (m)	R.L. (m)	h (m)	Vex (m3)	Vos (m3)	Vlo (m3)	Vbf (m3)	Cmpot (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-1	1.2	1.9	5.522	2.444	3.478	49.6	0.55	0.37	42.4	26.7	38.47	846	3.18
2	CM-1	1.2	1.9	5.562	3.399	2.563	27.4	0.55	0.37	21.9	17.7	28.59	623	2.42
3	CM-2	1.2	1.9	5.537	3.343	2.594	28	0.55	0.37	22.4	18	28.92	631	2.44
4	CM-3	1.2	1.9	5.437	3.303	2.534	26.8	0.55	0.37	21.3	17.5	28.27	616	2.4
5	CM-4	1.2	1.9	5.437	3.228	2.608	28.3	0.55	0.37	22.7	18.1	29.07	634	2.45
6	CM-4-1	1.2	1.9	5.537	3.269	2.668	29.5	0.55	0.37	23.8	18.7	29.72	649	2.5
7	CM-5	1.2	1.9	5.637	3.189	2.848	33.4	0.55	0.37	27.3	20.3	31.68	693	2.65
8	CM-5-1	1.2	1.9	5.637	3.205	2.832	33.1	0.55	0.37	27.1	20.2	31.49	689	2.64
9	CM-6	1.2	1.9	5.637	3.055	2.982	36.5	0.55	0.37	30.2	21.6	33.11	725	2.76
10	CM-7	1.2	1.9	5.857	2.691	3.566	52.2	0.55	0.37	44.8	27.7	39.42	867	3.23
11	CM8-1	1.2	1.9	5.507	2.755	3.152	40.7	0.55	0.37	34.1	23.3	34.95	766	2.9
12	CM8-1-1	1.2	1.9	5.592	2.819	3.173	41.3	0.55	0.37	34.6	23.5	35.17	772	2.91
13	CM-8-2	1.2	1.9	5.507	2.795	3.112	39.7	0.55	0.37	33.2	22.9	34.51	757	2.86
14	CM-8-2-1	1.2	1.9	5.602	2.821	3.181	41.5	0.55	0.37	34.8	23.6	35.26	773	2.92
15	CM-8-3	1.2	1.9	5.507	2.258	3.649	54.7	0.55	0.37	47.2	28.6	40.31	887	3.3
16	CM-8-4	1.2	1.9	5.507	2.895	3.012	37.3	0.55	0.37	30.9	21.9	33.43	732	2.78
17	DM-1	1.2	1.9	6.25	4.797	1.853	15.4	0.55	0.37	11.2	11.9	20.92	451	1.84
18	DM-2	1.2	1.9	6.5	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	6.2	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	2.46
21	DM-4-1	1.2	1.9	5.34	3.047	2.893	30.1	0.55	0.37	24.3	18.9	29.99	655	2.52
22	DM-5	1.2	1.9	5.34	2.885	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	2.883	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	2.884	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

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	2.82	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	2.816	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	2.809	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

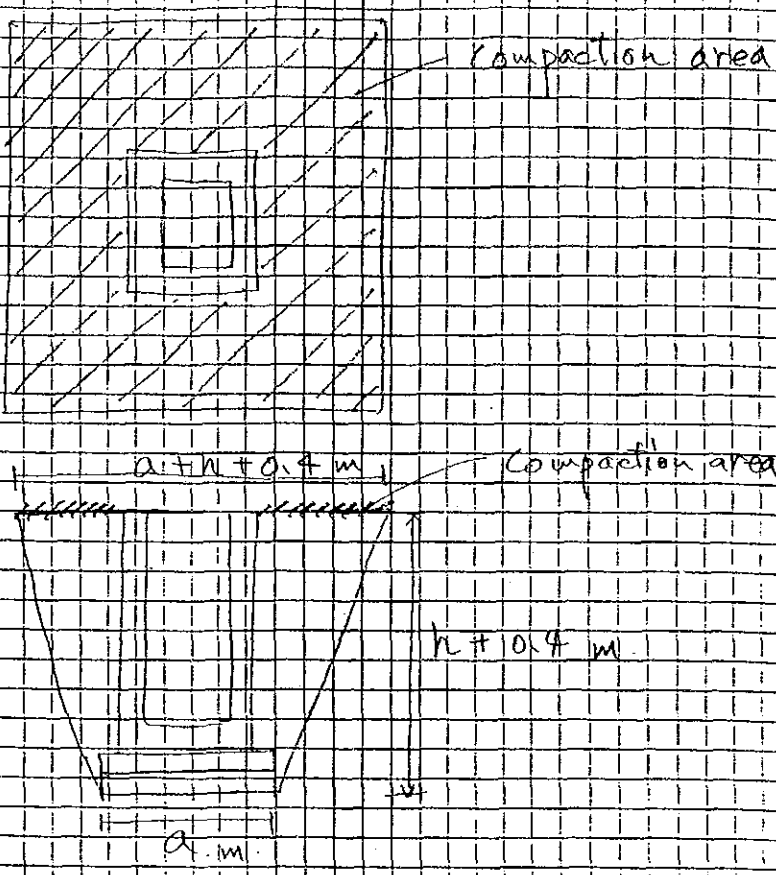
## Grating cover

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	576	11,300	49

## To oil separator

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							360	4.4	3.0	273	167	296	6,020	38

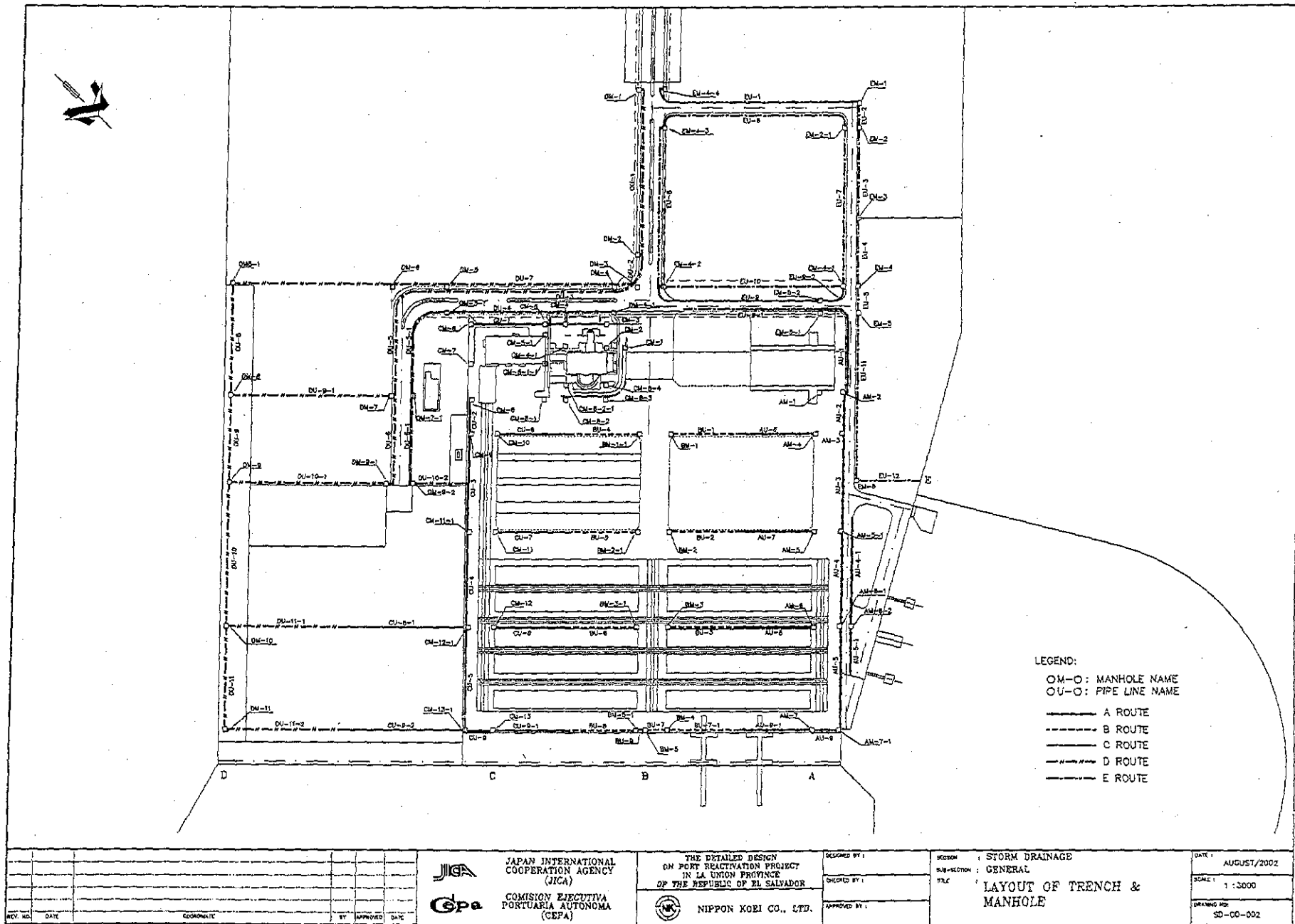
QUANTITY CALCULATION COVER SHEET								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>	JC1N004/2N001			
<b>Work Section Title</b>	Manhole 1500mm grating			<b>Pay Item No. (BOQ)</b>	2H-100702			
<b>Quantity Item</b>	Compaction			<b>Unit</b>	m <sup>2</sup>			
<b>Calculation Procedure Applied</b>  <div style="font-family: cursive; padding: 10px;">           Compaction area was to be the surface of excavation area.         </div>								
<b>References, Calculation Base and Revisions</b>  <div style="font-family: cursive; padding: 10px;">           See the item of excavation and disposal of 1500 mm concrete cover. (2H-0701)         </div>								
Rev	Prepared		No. of	Checked		Reviewed		Superseded
	by	Date	Pages	by	Date	by	Date	by Calc No.
0	Karl Garcia	[Signature]		Mr. Inuma		Mr. Ando		
1								
2								
3								

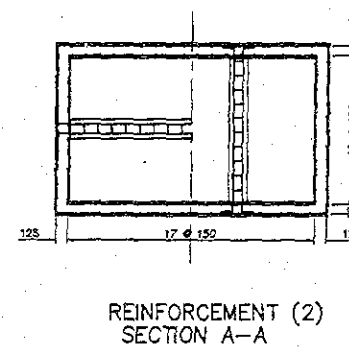
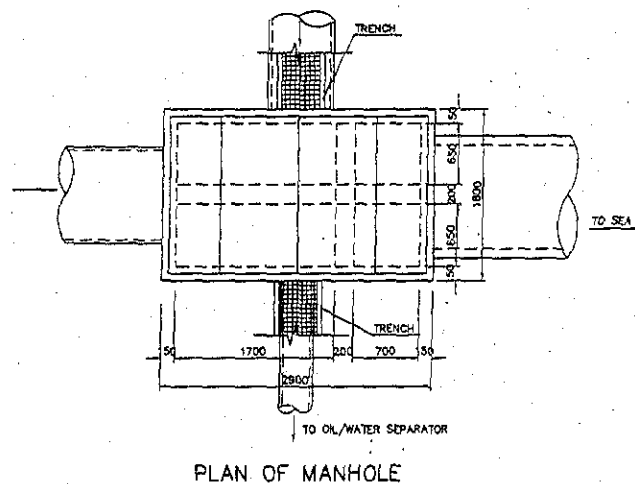
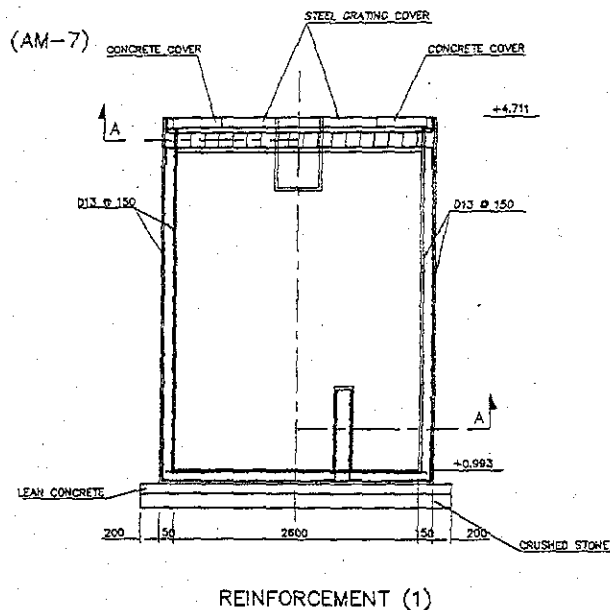
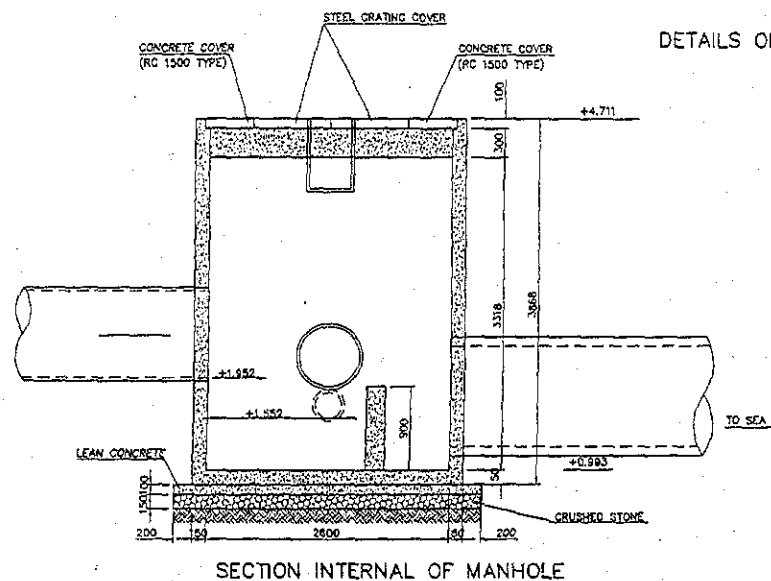
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
<b>Section</b>	Manhole 1500mm grating cover	Calc. Index No.	
<b>Subject</b>	Compaction	Page No.	Rev.
		References/ Notes	
			
$A = (a + h + 0.4)^2 - 1.8^2$			
Prepared by		Checked by	
/ /200		/ /200	




Concrete cover														
		W (m)	a (m)	GL (m)	B.L (m)	h (m)	Vex (m3)	Vcs (m3)	Vic (m3)	Vbf (m3)	Cmpot (m2)	Form (m2)	Re-bar (kg)	Concrete (m3)
1	AM-1	1.2	1.9	5.522	2.444	3.478	49.6	0.55	0.37	42.4	26.7	38.47	846	3.18
2	CM-1	1.2	1.9	5.562	3.399	2.663	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	2.694	28	0.55	0.37	22.4	18	28.92	631	2.44
4	CM-3	1.2	1.9	5.437	3.303	2.634	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	2.891	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	767	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	29.89	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	2.884	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														
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	3.718	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	51.8	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	42.6	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	2.68
16	DM-7	1.5	2.2	5.17	2.655	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														
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	3.748	66.8	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														
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								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>	JC1N004/2N001			
<b>Work Section Title</b>	Manhole connecting to Oil Separator			<b>Pay Item No. (BOQ)</b>	2H-1101			
<b>Quantity Item</b>	Excavation and Disposal			<b>Unit</b>	m <sup>3</sup>			
<b>Calculation Procedure Applied</b>								
<p>1. Calculation of depth of manhole.</p> <p>2. Calculation of volume of excavation (Excel)</p>								
<b>References, Calculation Base and Revisions</b>								
<p>DW-SD-00-002</p> <p>DW-SD-01-011 ~ 017</p>								
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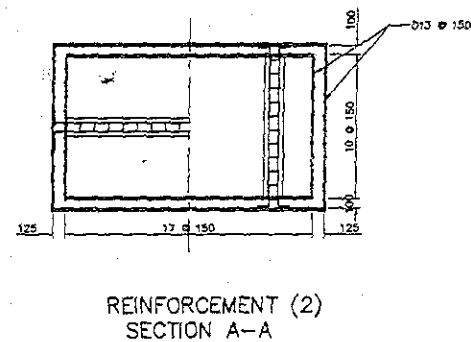
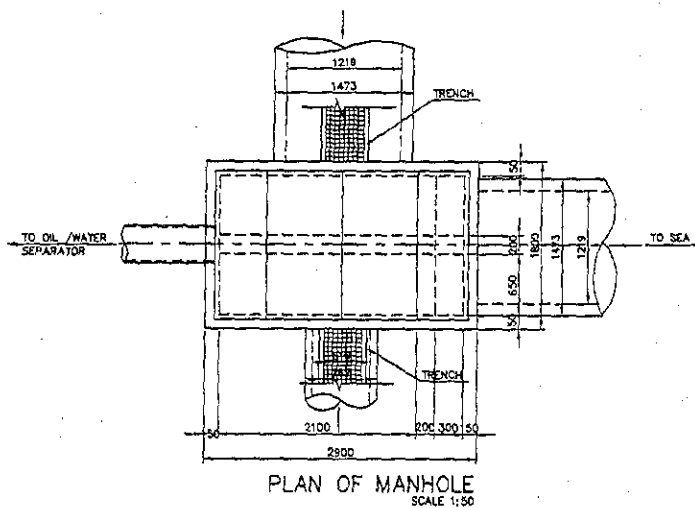
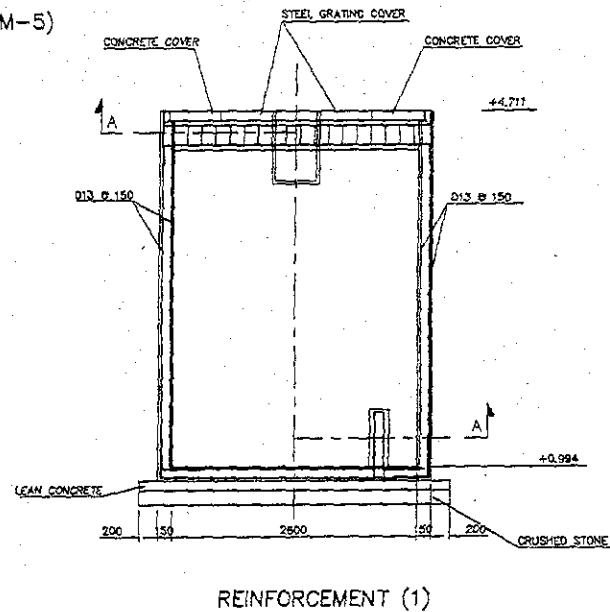
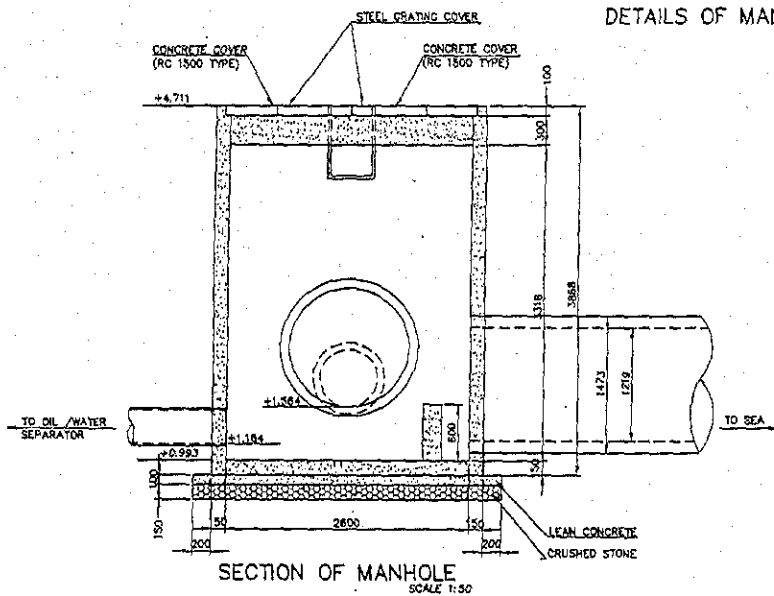









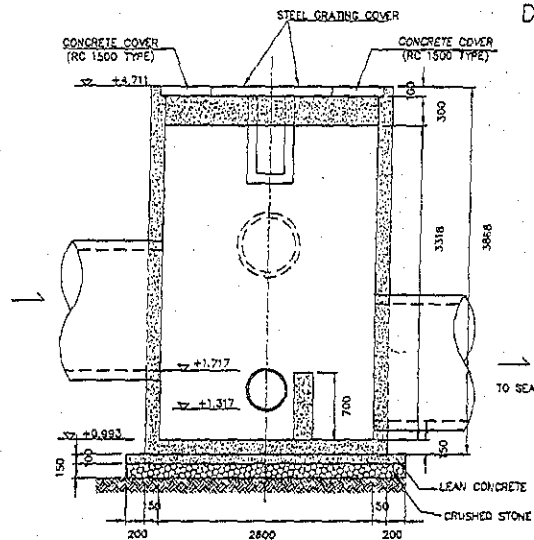
						 JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		THE DETAILED DESIGN ON PORT REACTIVATION PROJECT IN LA UNION PROVINCE OF THE REPUBLIC OF EL SALVADOR		DESIGNED BY :  CHECKED BY :  APPROVED BY :		SECTION : STORM DRAINAGE SUB-SECTION : PROFILE AND DETAILS TITLE :  DETAILS OF MANHOLE (3)		DATE : AUGUST/2002 SCALE : 1:50 DRAWING NO. : SD-01-011	
						 COMISION EJECUTIVA PORTUARIA AUTONOMA (CEPA)		 NIPPON KOEI CO., LTD.							
REV. NO.	DATE	COORDINATE	BY	APPROVED	DATE										

# DETAILS OF MANHOLE (BM-5)

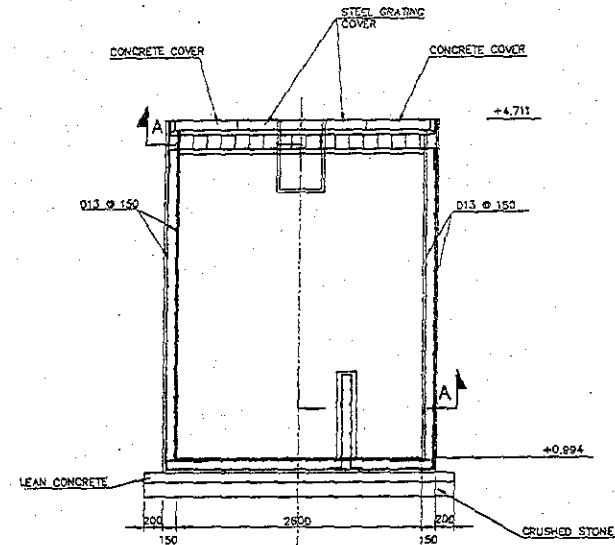


NO.	REV.	DATE	COORDINATE	BY	APPROVED	DATE	 JICA JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)   COMISION EJECUTIVA PORTUARIA AUTONOMA (CEPA)	THE DETAILED DESIGN ON PORT REACTIVATION PROJECT IN LA UNION PROVINCE OF THE REPUBLIC OF EL SALVADOR   NIPPON KOEI CO., LTD.	DESIGNED BY :  CHECKED BY :  APPROVED BY :	SECTION : STORM DRAINAGE DRAW-SECTION : PROFILE AND DRAINAGE  FILE : DETAILS OF MANHOLE (4)	DATE : AUGUST/2002  SCALE : AS INDICATED  DRAWING NO. : SD-01-012
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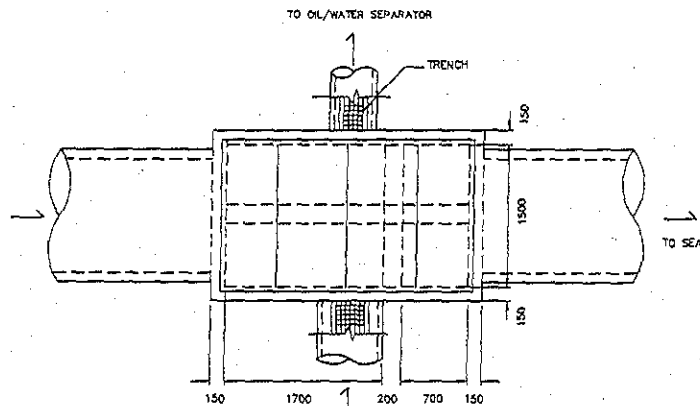
# DETAILS OF MANHOLE (CM-13)



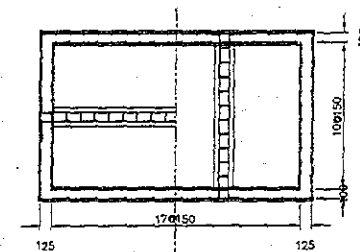
SECTION OF MANHOLE



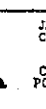
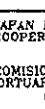
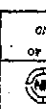
REINFORCEMENT (1)



PLAN OF MANHOLE



REINFORCEMENT (2)  
SECTION A-A

REV. NO.	DATE	COORDINATE	BY	APPROVED	DATE	 <p>JICA JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)</p>  <p>COMISION EJECUTIVA PORTUARIA AUTONOMA (CEPA)</p>	<p>THE DETAILED DESIGN ON PORT REACTIVATION PROJECT IN LA UNION PROVINCE OF THE REPUBLIC OF EL SALVADOR</p>  <p>NIPPON KOSI CO., LTD.</p>	<p>DESIGNED BY :</p> <p>CHECKED BY :</p> <p>APPROVED BY :</p>	<p>SECTION : STORM DRAINAGE</p> <p>SUB-SECTION : PROFILE AND DETAILS</p> <p>TITLE : DETAILS OF MANHOLE (5)</p>	<p>DATE : AUGUST/2032</p> <p>SCALE : 1:50</p> <p>DRAWING NO. : SD-01-013</p>
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## Concrete cover

		W (m)	a (m)	GL (m)	B.L. (m)	h (m)	Vex (m <sup>3</sup> )	Vcs (m <sup>3</sup> )	Vlo (m <sup>3</sup> )	Vbf (m <sup>3</sup> )	Cmpot (m <sup>2</sup> )	Form (m <sup>2</sup> )	Re-bar (kg)	Concrete (m <sup>3</sup> )
1	AM-1	1.2	1.9	5.522	2.444	3.478	49.6	0.55	0.37	42.4	26.7	38.47	846	3.18
2	CM-1	1.2	1.9	5.562	3.399	2.663	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	28.8	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	5.837	3.189	2.848	33.4	0.55	0.37	27.3	20.3	31.68	693	2.65
8	CM-5-1	1.2	1.9	5.837	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	5.837	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	33.42	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	2.893	30.1	0.55	0.37	24.3	18.9	29.99	655	2.52
22	DM-5	1.2	1.9	5.34	2.885	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	4.825	2.7	3.255	22.9	0.55	0.37	17.8	15.7	26.01	565	2.23
26	DM-9-1	1.2	1.9	5.01	2.546	2.864	33.8	0.55	0.37	27.7	20.5	31.84	696	2.66
27	DM-9-2	1.2	1.9	5.01	2.584	2.846	33.4	0.55	0.37	27.3	20.3	31.64	692	2.65
28	EM-1	1.2	1.9	6.06	3.897	2.563	27.4	0.55	0.37	21.9	17.7	28.59	623	2.42
29	EM-2	1.2	1.9	5.97	3.799	2.571	27.6	0.55	0.37	22	17.8	28.67	625	2.43
30	EM-2-1	1.2	1.9	5.97	3.808	2.562	27.4	0.55	0.37	21.9	17.7	28.57	623	2.42
31	EM-3	1.2	1.9	5.59	3.39	2.6	28.1	0.55	0.37	22.5	18	28.98	632	2.45
32	EM-4-2	1.2	1.9	5.43	3.972	1.858	15.5	0.55	0.37	11.2	11.9	20.97	452	1.85
33	EM-4-3	1.2	1.9	6.14	4.687	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

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	4.825	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	2.885	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	3.48
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	2.618	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

1	AM-4	1.5	2.2	5.332	2.28	3.452	56.7	0.73	0.49	46.1	28.8	46.85	915	3.91
2	AM-5	1.5	2.2	5.132	2.109	3.423	55.8	0.73	0.49	45.3	28.4	46.27	908	3.88
3	AM-6	1.5	2.2	4.928	1.934	3.394	54.9	0.73	0.49	44.5	28.1	45.89	900	3.85
4	BM-1	1.5	2.2	5.332	1.881	3.851	70.4	0.73	0.49	58.7	33.4	51.92	1021	4.3
5	BM-1-1	1.5	2.2	5.332	1.929	3.803	68.6	0.73	0.49	57.1	32.8	51.28	1008	4.26
6	BM-2	1.5	2.2	5.132	1.71	3.822	69.3	0.73	0.49	57.7	33.1	51.54	1013	4.27
7	BM-2-1	1.5	2.2	5.132	1.758	3.774	67.8	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	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	576	11,300	49

## To oil separator

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								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>	JC1N004/2N001			
<b>Work Section Title</b>	Manhole connecting to oil separator			<b>Pay Item No. (BOQ)</b>	2H-1102			
<b>Quantity Item</b>	Crushed stone			<b>Unit</b>	m <sup>3</sup>			
<b>Calculation Procedure Applied</b>  <p style="font-size: 1.2em; margin: 10px 0;">Volume of crushed stone was computed by multiplying area by thickness.</p>								
<b>References, Calculation Base and Revisions</b>  <p style="font-size: 1.2em; margin: 10px 0;">See the last item (2H-1101)</p>								
Rev	Prepared		No. of	Checked		Reviewed		Superseded
	by	Date	Pages	by	Date	by	Date	by Calc No.
0				Iinuma		Ando		
1								
2								
3								

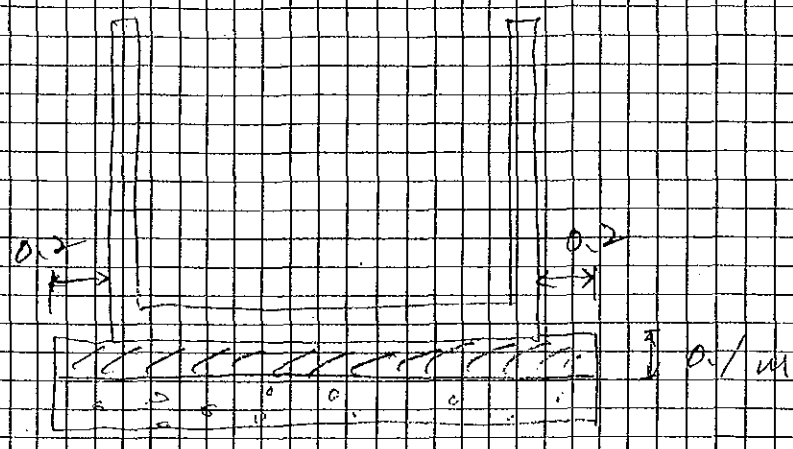
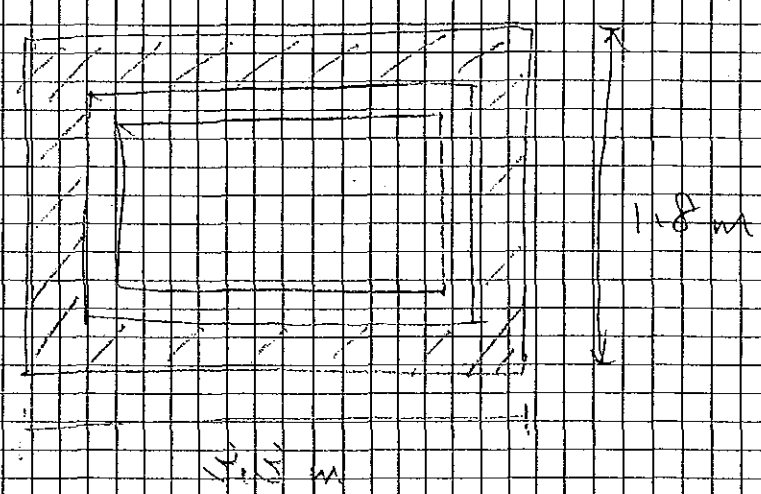
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
<b>Section</b>	Manhole connecting to oil separator	Calc. Index No.	
<b>Subject</b>	Crushed stone	Page No.	Rev.
		References/Notes	
$V = 0.15 \times 3.3 \times 1.8$ $= 4.4 \text{ m}^3$			
Prepared by		Checked by	
/ /200		/ /200	



QUANTITY CALCULATION COVER SHEET								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>	JC1N004/2N001			
<b>Work Section Title</b>	Manhole connecting to oil separator			<b>Pay Item No. (BOQ)</b>	2H-1103			
<b>Quantity Item</b>	Lean concrete			<b>Unit</b>	m <sup>3</sup>			
<b>Calculation Procedure Applied</b>								
<p>Volume of lean concrete was computed by multiplying area by thickness.</p>								
<b>References, Calculation Base and Revisions</b>								
<p>See the item of excavation and disposal of 500mm. (2H-1101)</p>								
Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
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3								

<b>Project</b>	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
<b>Section</b>	Manhole connecting to oil separator	Calc. Index No.	
<b>Subject</b>	Lean concrete	Page No.	Rev.

References/ Notes
  $V = 3.3 \times 1.8 \times 0.1$ $= 0.6 \text{ m}^3$

Prepared by		Checked by	
	/ /200		/ /200

QUANTITY CALCULATION COVER SHEET								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province		<b>Project Code</b>	JC1N004/2N001				
<b>Work Section Title</b>	Manhole connecting to oil Sepa		<b>Pay Item No. (BOQ)</b>	2H-1104				
<b>Quantity Item</b>	Reinforcement		<b>Unit</b>	kg				
<b>Calculation Procedure Applied</b>  <p style="font-size: 1.2em;">Weight of reinforcement was computed by multiplying unit weight by the height. Unit weight was computed on assumption that the height was 2m.</p>								
<b>References, Calculation Base and Revisions</b>  <p style="font-size: 1.2em;">See the item of excavation and disposal of 1500mm. (2H-1101)</p>								
Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded
	by	Date		by	Date	by	Date	by Calc No.
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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
Manhole (H=2m, 1500x2600)						
A1	D13	5.10	28	5.0745	142.09	
A2	D13	4.50	26	4.4775	116.42	
B1	D13	2.55	62	2.53725	157.31	
B2	D13	2.40	58	2.388	138.5	
C1	D13	2.60	11	2.587	28.46	
C2	D13	2.30	10	2.2885	22.89	
D1	D13	3.70	18	3.6815	66.27	
D2	D13	3.40	17	3.383	57.51	
				total	729.45	1 spot
					365	1 spot / m

## Concrete cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m <sup>3</sup> )	Vos (m <sup>3</sup> )	Vlo (m <sup>3</sup> )	Vbf (m <sup>3</sup> )	Cmpet (m <sup>2</sup> )	Form (m <sup>2</sup> )	Re-bar (kg)	Concrete (m <sup>3</sup> )
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	2.694	28	0.55	0.37	22.4	18	28.92	631	2.41
4	CM-3	1.2	1.9	5.437	3.303	2.534	26.8	0.55	0.37	21.3	17.5	28.27	616	2.4
5	CM-4	1.2	1.9	5.437	3.229	2.608	28.3	0.55	0.37	22.7	18.1	29.07	634	2.45
6	CM-4-1	1.2	1.9	5.537	3.269	2.668	29.5	0.55	0.37	23.8	18.7	29.72	649	2.5
7	CM-5	1.2	1.9	5.637	3.189	2.848	33.4	0.55	0.37	27.3	20.3	31.68	693	2.65
8	CM-5-1	1.2	1.9	5.637	3.205	2.832	33.1	0.55	0.37	27.1	20.2	31.49	689	2.64
9	CM-6	1.2	1.9	5.637	3.055	2.982	36.5	0.55	0.37	30.2	21.6	33.11	725	2.76
10	CM-7	1.2	1.9	5.857	2.691	3.566	52.2	0.55	0.37	44.8	27.7	39.42	867	3.23
11	CM8-1	1.2	1.9	5.507	2.755	3.152	40.7	0.55	0.37	34.1	23.3	34.95	766	2.9
12	CM8-1-1	1.2	1.9	5.592	2.819	3.173	41.3	0.55	0.37	34.6	23.5	35.17	772	2.91
13	CM-8-2	1.2	1.9	5.507	2.795	3.112	39.7	0.55	0.37	33.2	22.9	34.51	757	2.86
14	CM-8-2-1	1.2	1.9	5.802	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	20.82	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	2.46
21	DM-4-1	1.2	1.9	5.34	3.047	2.893	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	3.235	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	2.884	33.8	0.55	0.37	27.7	20.5	31.84	696	2.66
27	DM-9-2	1.2	1.9	5.01	2.584	2.846	33.4	0.55	0.37	27.3	20.3	31.64	692	2.65
28	EM-1	1.2	1.9	6.08	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	28.96	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

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	3.66
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	3.63
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	3.6
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	2.685	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	28.7	20.6	36.46	711	3.14
19	EM-4	1.5	2.2	5.33	3.114	2.618	33.7	0.73	0.49	25.4	20	35.62	694	3.08
20	EM-4-1	1.5	2.2	5.33	3.308	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

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	576	11,300	49

## To oil separator

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								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>	JC1N004/2N001			
<b>Work Section Title</b>	Manhole connecting to oil sepa.			<b>Pay Item No. (BOQ)</b>	2H-1105			
<b>Quantity Item</b>	Corner Angle			<b>Unit</b>	kg			
<b>Calculation Procedure Applied</b>  <div style="font-family: cursive; font-size: 1.2em; padding: 10px;"> Weight of corner angle was computed by multiplying unit weight by the length. </div>								
<b>References, Calculation Base and Revisions</b>  <div style="font-family: cursive; font-size: 1.2em; padding: 10px;"> See the item 2H-1101. </div>								
Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
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1								
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3								

2002/9/10

**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

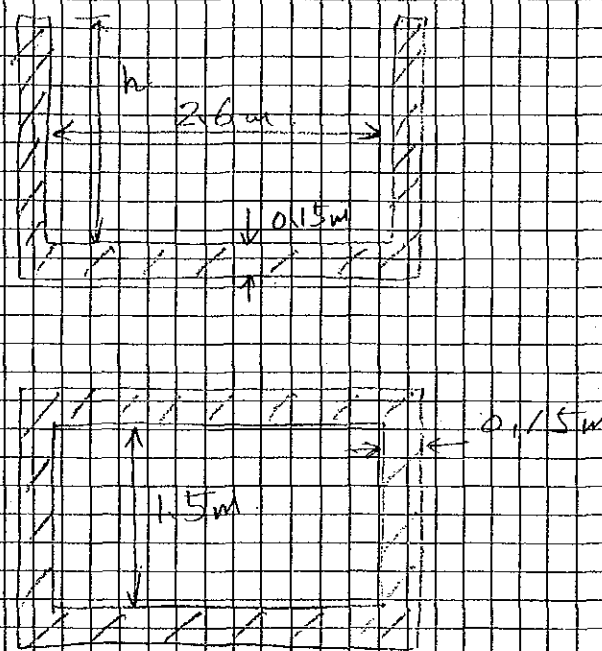
QUANTITY CALCULATION COVER SHEET								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>	JC1N004/2N001			
<b>Work Section Title</b>	Manhole connecting to oil sepa.			<b>Pay Item No. (BOQ)</b>	2H-110601			
<b>Quantity Item</b>	Form for Manhole			<b>Unit</b>	m <sup>2</sup>			
<b>Calculation Procedure Applied</b> <div style="border: 1px solid black; padding: 10px; min-height: 150px; margin-top: 5px;"> <p style="font-size: 1.2em;">Area of form for manhole was computed by combining inside with outside.</p> </div>								
<b>References, Calculation Base and Revisions</b> <div style="border: 1px solid black; padding: 10px; min-height: 150px; margin-top: 5px;"> <p style="font-size: 1.2em;">See the item of Excavation and Disposal (2H-1101).</p> </div>								
Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
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3								



<b>Project</b>	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
<b>Section</b>	Manhole connecting oil separator	Calc. Index No.	
<b>Subject</b>	Form for Manhole	Page No.	Rev.
		References/ Notes	
$A = (1.8 + 2.9) \times 2 \times (h + 0.15)$ $+ (1.5 + 2.6) \times 2 \times h$			
Prepared by		Checked by	
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Concrete cover		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m3)	Vcs (m3)	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	17.5	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	21.8	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	3.162	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	30.84	669	2.57
19	DM-3	1.2	1.9	5.2	3.045	2.555	27.2	0.55	0.37	21.7	17.6	28.5	621	2.41
20	DM-4	1.2	1.9	5.34	3.125	2.615	28.4	0.55	0.37	22.8	18.2	29.15	636	2.46
21	DM-4-1	1.2	1.9	5.34	3.047	2.693	30.1	0.55	0.37	24.3	18.9	29.99	655	2.52
22	DM-5	1.2	1.9	5.34	2.865	2.875	34.1	0.55	0.37	28	20.6	31.95	699	2.67
23	DM-5-1	1.2	1.9	5.34	2.887	2.853	33.6	0.55	0.37	27.5	20.4	31.72	694	2.65
24	DM-7-1	1.2	1.9	5.17	2.683	2.887	34.3	0.55	0.37	28.2	20.7	32.08	702	2.68
25	DM-8-1	1.2	1.9	4.625	2.7	2.325	22.9	0.55	0.37	17.8	15.7	26.01	565	2.23
26	DM-9-1	1.2	1.9	5.01	2.546	2.864	33.8	0.55	0.37	27.7	20.5	31.84	696	2.66
27	DM-9-2	1.2	1.9	5.01	2.584	2.846	33.4	0.55	0.37	27.3	20.3	31.64	692	2.65
28	EM-1	1.2	1.9	6.06	3.897	2.563	27.4	0.55	0.37	21.9	17.7	28.59	623	2.42
29	EM-2	1.2	1.9	5.97	3.799	2.571	27.6	0.55	0.37	22	17.8	28.67	625	2.43
30	EM-2-1	1.2	1.9	5.97	3.808	2.562	27.4	0.55	0.37	21.9	17.7	28.57	623	2.42
31	EM-3	1.2	1.9	5.59	3.39	2.6	28.1	0.55	0.37	22.5	18	28.98	632	2.45
32	EM-4-2	1.2	1.9	5.43	3.972	1.858	15.5	0.55	0.37	11.2	11.9	20.97	452	1.85
33	EM-4-3	1.2	1.9	6.14	4.687	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	12.8	883	662	1,040	22,800	87.0
Concrete cover														
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	4.18
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	2.618	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	2.841	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	2.819	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														
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														
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								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>	JC1N004/2N001			
<b>Work Section Title</b>	Manhole connecting to oil sepa.			<b>Pay Item No. (BOQ)</b>	2H-110602			
<b>Quantity Item</b>	Concrete for manhole			<b>Unit</b>	m <sup>3</sup>			
<b>Calculation Procedure Applied</b>  <div style="text-align: center;"> <math display="block">\text{Height} = \text{G.L.} - \text{B.L.} + 0.15 \text{ (m)}</math> <p>Volume of concrete for manhole was computed by deduction inner volume from total volume.</p> </div>								
<b>References, Calculation Base and Revisions</b>  <div style="text-align: center;"> <p>See the item of excavation and disposal</p> <p>(2H-1101)</p> </div>								
Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
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<b>Project</b>	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
<b>Section</b>	Manhole connecting to oil separator	Calc. Index No.	
<b>Subject</b>	Concrete for manhole	Page No.	Rev.
		References/ Notes	
			
$V = 1.8 \times 2.9 \times (h + 0.15)$ $= 1.5 \times 2.6 \times h$			
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## Concrete cover

		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m <sup>3</sup> )	Vcs (m <sup>3</sup> )	Vlc (m <sup>3</sup> )	Vbf (m <sup>3</sup> )	Cmpct (m <sup>2</sup> )	Form (m <sup>2</sup> )	Re-bar (kg)	Concrete (m <sup>3</sup> )
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	19	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	62.2	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	20.8	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	2.548	2.864	33.8	0.55	0.37	27.7	20.5	31.64	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	4.087	1.653	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

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	47.8	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	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	25.8	20.1	35.68	695	3.09
Total							1,110	17.6	11.8	880	600	1,000	19,600	85

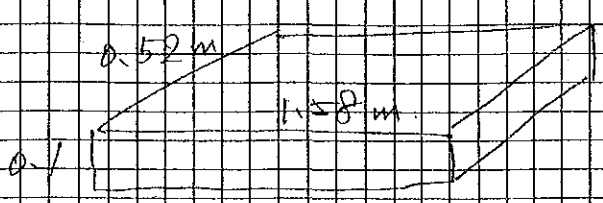
## Grating cover

1	AM-4	1.5	2.2	5.332	2.28	3.452	56.7	0.73	0.49	46.1	28.8	46.05	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

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								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>	JC1N004/2N001			
<b>Work Section Title</b>	Manhole connecting to oil sepa.			<b>Pay Item No. (BOQ)</b>	2H-110603			
<b>Quantity Item</b>	Form for concrete cover			<b>Unit</b>	m <sup>2</sup>			
<b>Calculation Procedure Applied</b>  <p style="font-size: 1.2em;">Area of form for concrete cover was computed by unit area by the number.</p>								
<b>References, Calculation Base and Revisions</b>  <p style="font-size: 1.2em;">See the item 2H-1101.</p>								
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<b>Project</b>	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
<b>Section</b>	Manhole connecting to oil separator	Calc. Index No.	
<b>Subject</b>	Form for concrete cover	Page No.	Rev.
		References/ Notes	
 <p>Side</p> $A_1 = (1.58 \times 2 + 0.52 \times 2) \times 0.1$ $= 0.42 \text{ m}^2$ <p>Bottom</p> $A_2 = 1.58 \times 0.52 = 0.83$ $A_T = (0.42 + 0.83) \times 2 \times 4$ $= 10.0 \text{ m}^2$			
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### QUANTITY CALCULATION COVER SHEET

<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province	<b>Project Code</b>	JC1N004/2N001
<b>Work Section Title</b>	Manhole connecting to oil sepa.	<b>Pay Item No. (BOQ)</b>	2H-110604
<b>Quantity Item</b>	Reinforcement for concrete	<b>Unit</b>	kg

**Calculation Procedure Applied**

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

**References, Calculation Base and Revisions**

See the item 2H-1101,

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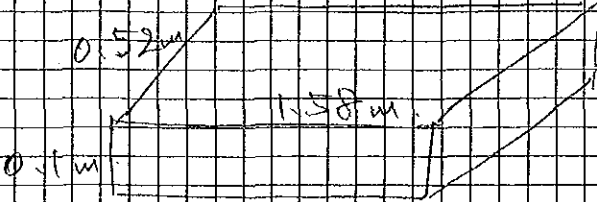


TABLE OF REINFORCEMENT (MANHOLE COVER)

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
Manhole cover (1500x2600)						
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		9.40			41.7	per spot
Re-bar	D9	0.10	32	0.05	1.6	per spot

<b>Project</b>	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
<b>Section</b>	Manhole connecting to oil separator	Calc. Index No.	
<b>Subject</b>	Reinforcement for cover concrete	Page No.	Rev.
$W = (10.15 \times 2 + 1.6) \times 4$ $= [87.6] \text{ kg}$		References/Notes	
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QUANTITY CALCULATION COVER SHEET								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>	JC1N004/2N001			
<b>Work Section Title</b>	Manhole connecting to oil sepa.			<b>Pay Item No. (BOQ)</b>	2H-110605			
<b>Quantity Item</b>	Concrete for concrete cover			<b>Unit</b>	m <sup>3</sup>			
<b>Calculation Procedure Applied</b>  <div style="font-family: cursive; font-size: 1.2em;">                     Concrete volume for concrete cover was computed                      by multiplying unit volume by the number.                 </div>								
<b>References, Calculation Base and Revisions</b>  <div style="font-family: cursive; font-size: 1.2em;">                     See the item 2H-1101.                 </div>								
<b>Rev</b>	<b>Prepared</b>		<b>No. of Pages</b>	<b>Checked</b>		<b>Reviewed</b>		<b>Superseded by Calc No.</b>
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<b>Project</b>	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
<b>Section</b>	Manhole connecting to concrete cover	Calc. Index No.	
<b>Subject</b>	Concrete for concrete cover	Page No.	Rev.
		References/Notes	
$V_1 = 1.58 \times 0.52 \times 0.1$ $= 0.083 \text{ m}^3$			
$V = 0.083 \times 2 \times 4$ $= 0.664$ $\approx \boxed{0.7} \text{ m}^3$			
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QUANTITY CALCULATION COVER SHEET								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>	JC1N004/2N001			
<b>Work Section Title</b>	Manhole connecting to oil/sepa.			<b>Pay Item No. (BOQ)</b>	2H-110606			
<b>Quantity Item</b>	grating cover			<b>Unit</b>	Nos			
<b>Calculation Procedure Applied</b>  <div style="font-size: 1.2em; margin-top: 20px;">Grating cover was computed.</div>								
<b>References, Calculation Base and Revisions</b>  <div style="font-size: 1.2em; margin-top: 20px;">See the item 2H-1101</div>								
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<b>Project</b>	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
<b>Section</b>	Manhole connecting to oil separator	Calc. Index No.	
<b>Subject</b>	grating cover	Page No.	Rev.
$N1 = 4 \times 2 = \boxed{8}$		References/Notes	
Prepared by		Checked by	
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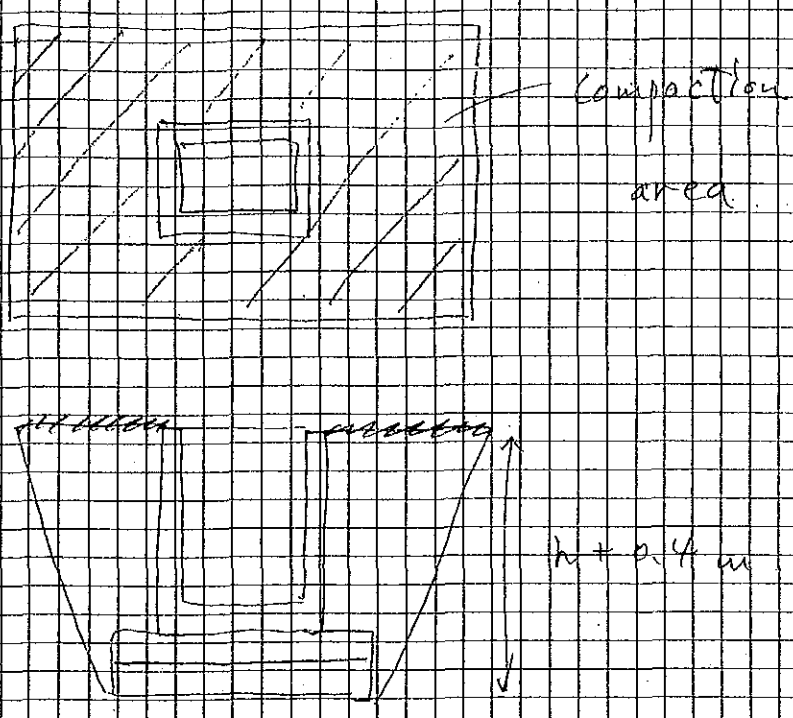
QUANTITY CALCULATION COVER SHEET								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>	JC1N004/2N001			
<b>Work Section Title</b>	Manhole connecting to oil sump.			<b>Pay Item No. (BOQ)</b>	2H-110701			
<b>Quantity Item</b>	Backfill sand			<b>Unit</b>	m <sup>3</sup>			
<b>Calculation Procedure Applied</b>  <p style="font-size: 1.2em;">Volume of backfill sand was computed by deduction of crushed stone, lean concrete and manhole from the excavation volume.</p>								
<b>References, Calculation Base and Revisions</b>  <p style="font-size: 1.2em;">See the item 2H-1101.</p>								
Rev	Prepared		No. of	Checked		Reviewed		Superseded
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<b>Project</b>	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
<b>Section</b>	Manhole connecting to oil separator	Calc. Index No.	
<b>Subject</b>	Backfill sand	Page No.	Rev.
		References/ Notes	
$V_{BF} = V_{EX} - V_{CS} - V_{LC} - V_M$			
$V_{BF}$ : volume of backfill			
$V_{EX}$ : volume of excavation			
$V_{CS}$ : volume of crushed stone			
$V_{LC}$ : volume of lean concrete			
$V_M$ : manhole			
Prepared by		Checked by	
/ /200		/ /200	



Concrete cover		W (m)	a (m)	G.L. (m)	B.L. (m)	h (m)	Vex (m <sup>3</sup> )	Vcs (m <sup>3</sup> )	Vio (m <sup>3</sup> )	Vbf (m <sup>3</sup> )	Compot (m <sup>2</sup> )	Form (m <sup>2</sup> )	Re-bar (kg)	Concrete (m <sup>3</sup> )
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	3.10
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	5.607	2.755	3.152	40.7	0.55	0.37	34.1	23.3	34.95	786	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	6.5	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	2.48
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	28.01	565	2.23
26	DM-9-1	1.2	1.9	5.01	2.546	2.864	33.8	0.55	0.37	27.7	20.5	31.84	696	2.66
27	DM-9-2	1.2	1.9	5.01	2.564	2.848	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														
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	38	24.7	41.75	817	3.54
11	CM-13-1	1.5	2.2	4.711	1.44	3.671	64	0.73	0.49	52.8	31.3	49.54	973	4.13
12	CM-8	1.5	2.2	5.507	2.62	3.287	51.6	0.73	0.49	41.5	26.9	44.47	872	3.75
13	CM-9	1.5	2.2	5.332	2.55	3.182	48.5	0.73	0.49	38.7	25.8	43.09	844	3.64
14	DM-10	1.5	2.2	4.844	2.084	3.16	47.8	0.73	0.49	38	25.5	42.8	838	3.62
15	DM-6	1.5	2.2	4.625	2.836	2.189	24.7	0.73	0.49	17.6	16.1	29.98	581	2.66
16	DM-7	1.5	2.2	5.17	2.685	2.905	40.8	0.73	0.49	31.7	22.9	39.43	770	3.37
17	DM-8	1.5	2.2	5.119	2.519	3	43.4	0.73	0.49	34.1	23.8	40.68	795	3.46
18	DM-9	1.5	2.2	5.019	2.739	2.68	35.2	0.73	0.49	26.7	20.6	38.46	711	3.14
19	EM-4	1.5	2.2	5.33	3.114	2.616	33.7	0.73	0.49	25.4	20	35.62	694	3.08
20	EM-4-1	1.5	2.2	5.33	3.306	2.424	29.5	0.73	0.49	21.7	18.2	33.08	643	2.89
21	EM-5	1.5	2.2	5.22	2.979	2.641	34.3	0.73	0.49	25.9	20.2	35.95	700	3.11
22	EM-5-1	1.5	2.2	5.22	3.001	2.619	33.8	0.73	0.49	25.5	20	35.66	695	3.08
23	EM-5-2	1.5	2.2	5.22	3.011	2.609	33.6	0.73	0.49	25.3	19.9	35.52	692	3.07
24	EM-6	1.5	2.2	4.89	2.669	2.621	33.9	0.73	0.49	25.6	20.1	35.68	695	3.09
Total							1,110	17.6	11.8	880	600	1,000	19,600	85
Grating cover														
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	68.6	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														
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								
<b>Project</b>	Detailed Design on Port Reactivation Project in La Union Province			<b>Project Code</b>	JC1N004/2N001			
<b>Work Section Title</b>	Manhole connecting to oil sep.			<b>Pay Item No. (BOQ)</b>	2H-110702			
<b>Quantity Item</b>	Compaction			<b>Unit</b>	m <sup>2</sup>			
<b>Calculation Procedure Applied</b> <div style="margin-top: 10px; font-family: cursive;">           Compaction area was to be the surface of excavation area.         </div>								
<b>References, Calculation Base and Revisions</b> <div style="margin-top: 10px; font-family: cursive;">           See the item 2H-1101.         </div>								
Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
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2								
3								

<b>Project</b>	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
<b>Section</b>	Manhole connecting to oil separator	Calc. Index No.	
<b>Subject</b>	Compaction	Page No.	Rev.
		References/ Notes	
$A = (a + h + 0.4) \times (b + h + 0.4)$ $= 1.8 \times 2.9$			
Prepared by		Checked by	
/ /200		/ /200	

## Concrete cover

		W (m)	a (m)	Q.L. (m)	B.L. (m)	h (m)	Vex (m3)	Ves (m3)	Vlo (m3)	Vbf (m3)	Cmpot (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	20.7	38.47	846	3.10
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	2.608	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	31.88	893	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	889	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	925	2.76
10	CM-7	1.2	1.9	5.857	2.691	3.566	62.2	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	786	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	3.225	22.9	0.55	0.37	17.8	15.7	26.01	565	2.23
26	DM-9-1	1.2	1.9	5.01	2.546	2.864	33.8	0.55	0.37	27.7	20.5	31.84	696	2.66
27	DM-9-2	1.2	1.9	5.01	2.564	2.846	33.4	0.55	0.37	27.3	20.3	31.64	692	2.65
28	EM-1	1.2	1.9	6.06	3.897	2.583	27.4	0.55	0.37	21.9	17.7	28.69	623	2.42
29	EM-2	1.2	1.9	5.97	3.789	2.571	27.6	0.55	0.37	22	17.8	28.87	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	682	1,040	22,600	87.0
Concrete cover														
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	3.871	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														
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	68.6	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	2.231	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	48.9	0.73	0.49	37.2	25.2	42.39	830	3.59
Total							730	8.8	5.9	600	380	576	11,300	49
To oil separator														
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