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	Pipe culvert 1219 mm	**Pay Item No. (BOQ)**	2H - 0503
Quantity Item	Lean concrete	**Unit**	m^3

Calculation Procedure Applied

Volume of lean concrete was computed by multiplying section area by actual length.

References, Calculation Base and Revisions

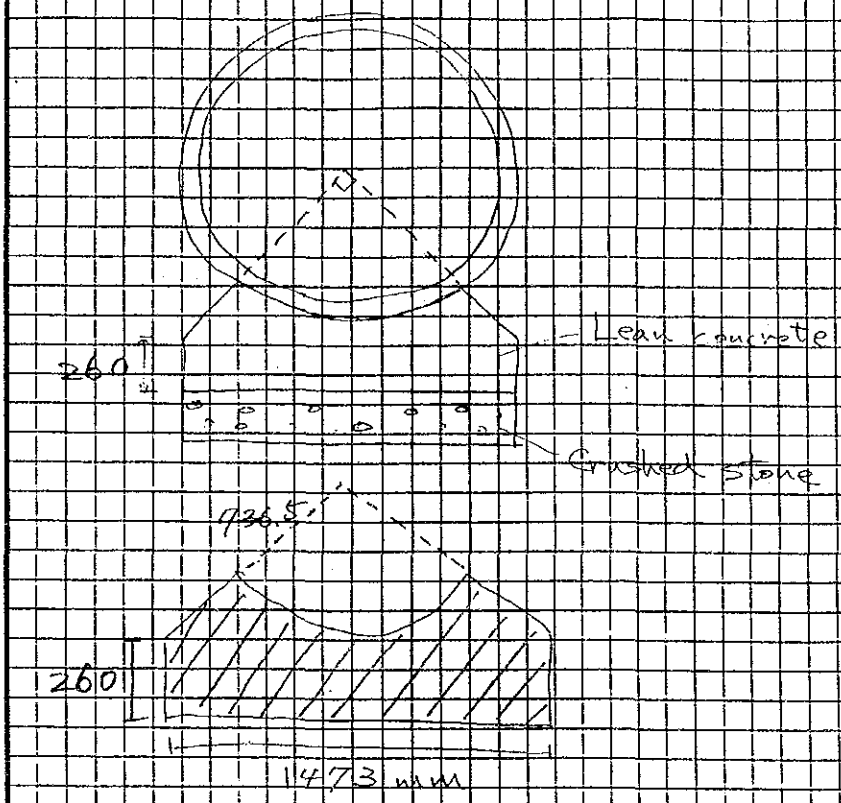
See the item of excavation and disposal of 45/mm (2H - 0502)

Rev	Prepared by	Prepared Date	No. of Pages	Checked by	Checked Date	Reviewed by	Reviewed Date	Superseded by Calc No.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

FN : Calculation_Cover_Sheet_020504_seg cover

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Pipe culvert 1219 mm	Calc. Index No.	
Subject	Lean concrete	Page No.	Rev.

References/ Notes



$$A = 0.26 \times 1.473 + 1.473 \times 0.7365 \div 2 - (0.7365)^2 \times \pi$$

$$V = A \times L_{ac}$$

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			/ /200				/ /200

FN: Calculation_Sheet

		D_{in} (m)	D_{out} (m)	t (m)	G (m)	Y_{in} (m)	Y_{out} (m)	H (m)	L (m)	Lac (m)	Vex (m3)	Vcs (m3)	Vlc (m3)	Vbf (m3)	Cmpct (m2)
1	CP-1	0.457	0.584	0.064	5.55	3.599	3.545	2.312	17	16.6	67	1.46	1.47	60	48.1
2	CP-2	0.457	0.584	0.064	5.487	3.543	3.505	2.297	20	19.6	78	1.72	1.74	70	56.5
3	CP-3	0.457	0.584	0.064	5.437	3.503	3.431	2.304	35	34.6	139	3.04	3.06	124	100
4	CP-4	0.457	0.584	0.064	5.537	3.429	3.391	2.461	20	19.6	88	1.72	1.74	80	59.7
5	CP-4-1	0.457	0.584	0.064	5.487	3.469	3.431	2.371	20	19.6	83	1.72	1.74	75	58
6	CP-5	0.457	0.584	0.064	5.637	3.389	3.257	2.648	70	69.6	352	6.1	6.16	321	225
7	CP-5-1	0.457	0.584	0.064	5.637	3.405	3.391	2.573	8	7.6	37	0.67	0.68	34	24
8	CP-7	0.457	0.584	0.064	5.682	2.891	2.824	3.158	35	34.6	237	3.04	3.06	222	129.5
9	CP-8-1	0.457	0.584	0.064	5.507	2.955	2.824	2.951	68	67.6	411	5.93	5.98	381	239
10	CP-8-1-1	0.457	0.584	0.064	5.55	3.019	2.957	2.896	30	29.6	175	2.6	2.62	162	103.1
11	CP-8-2	0.457	0.584	0.064	5.507	2.995	2.957	2.865	20	19.6	114	1.72	1.74	106	67.7
12	CP-8-2-1	0.457	0.584	0.064	5.555	3.021	2.997	2.88	10	9.6	56	0.85	0.85	52	33.3
13	CP-8-3	0.457	0.584	0.064	5.507	3.069	2.997	2.808	35	34.6	194	3.04	3.06	179	117.4
14	CP-8-4	0.457	0.584	0.064	5.507	3.095	3.071	2.758	10	9.6	52	0.85	0.85	48	32.1
15	DP-1	0.457	0.584	0.064	5.875	4.997	4.253	1.584	129.19	128.79	281	11.29	11.39	224	279.3
16	DP-2	0.457	0.584	0.064	5.35	3.347	3.249	2.386	20.82	20.42	87	1.79	1.81	78	60.7
17	DP-3	0.457	0.584	0.064	5.27	3.245	3.226	2.368	24.13	23.73	100	2.08	2.1	90	70.1
18	DP-4-1	0.457	0.584	0.064	5.34	3.247	3.226	2.437	21.75	21.35	94	1.88	1.89	85	64.5
19	DP-7-1	0.457	0.584	0.064	5.17	2.883	2.868	2.628	18.25	17.85	90	1.57	1.58	82	57.4
20	DP-9-1	0.457	0.584	0.064	5.015	2.746	2.543	2.704	150	149.6	784	13.11	13.23	718	491.9
21	DP-9-2	0.457	0.584	0.064	5.01	2.764	2.748	2.588	18.25	17.85	87	1.57	1.58	79	56.7
22	EP-1	0.457	0.584	0.064	6.015	4.097	4.003	2.299	20	19.6	79	1.72	1.74	71	56.6
23	EP-2	0.457	0.584	0.064	5.78	3.997	3.596	2.317	81.47	81.07	328	7.11	7.17	292	235.2
24	EP-2-1	0.457	0.584	0.064	5.97	4.008	4.003	2.298	9.1	8.7	35	0.77	0.77	32	25.1
25	EP-4-3	0.457	0.584	0.064	5.785	4.887	4.176	1.587	142.69	142.29	312	12.47	12.58	249	309
26	EP-4-4	0.457	0.584	0.064	6.195	4.997	4.893	1.584	22	21.6	48	1.9	1.91	39	46.9
27	EP-5-2	0.457	0.584	0.064	5.22	3.211	3.205	2.346	9.1	8.7	36	0.77	0.77	33	25.5
	Total								1,070		4450	92.5	93.3	3990	3080
1	AP-1	0.61	0.762	0.076	5.522	2.644	2.61	3.311	20	19.6	157	2.69	3.01	143	79.9
2	AP-2	0.61	0.762	0.076	5.427	2.606	2.532	3.274	40	39.6	312	5.44	6.07	283	159.9
3	AP-3	0.61	0.762	0.076	5.332	2.528	2.484	3.242	26	25.6	198	3.52	3.92	179	102.6
4	AP-4	0.61	0.762	0.076	5.232	2.48	2.313	3.251	85.78	85.38	663	11.72	13.08	600	342.7
5	AP-5-1	0.61	0.762	0.076	5.132	2.358	2.309	3.214	26	25.6	195	3.52	3.92	176	101.8
6	AP-6-1	0.61	0.762	0.076	4.928	2.182	2.138	3.184	26	25.6	192	3.52	3.92	173	101.1
7	AP-6-2	0.61	0.762	0.076	4.928	2.207	2.186	3.147	12.35	12.25	91	1.69	1.88	82	47.9
8	AP-7-1	0.61	0.762	0.076	4.711	1.997	1.952	3.152	26	25.6	189	3.52	3.92	170	100.2
9	BP-1-1	0.61	0.762	0.076	5.332	2.129	2.085	3.641	26	25.6	241	3.52	3.92	222	112.8
10	BP-2-1	0.61	0.762	0.076	5.132	1.958	1.914	3.612	26	25.6	238	3.52	3.92	219	112
11	BP-3-1	0.61	0.762	0.076	4.928	1.782	1.738	3.584	26	25.6	235	3.52	3.92	216	111.3
12	CP-11-1	0.61	0.762	0.076	5.132	2.579	2.535	2.991	26	25.6	173	3.52	3.92	154	96.1
13	CP-12-1	0.61	0.762	0.076	4.928	2.447	2.403	2.919	26	25.6	167	3.52	3.92	148	94.3
14	CP-13-1	0.61	0.762	0.076	4.711	1.64	1.596	3.509	26	25.6	227	3.52	3.92	208	109.4
15	CP-6	0.61	0.762	0.076	5.747	3.255	3.193	2.939	30	29.6	195	4.06	4.54	173	109.6
16	CP-8	0.61	0.762	0.076	5.42	2.82	2.754	3.049	35	34.6	242	4.75	5.3	216	131.9
17	CP-9	0.61	0.762	0.076	5.332	2.75	2.706	3.02	26	25.6	176	3.52	3.92	157	96.9
18	DP-4	0.61	0.762	0.076	5.34	3.225	3.066	2.61	160	159.6	862	21.9	24.44	743	538.2
19	DP-5-1	0.61	0.762	0.076	5.34	3.087	3.066	2.679	21.75	21.35	121	2.93	3.27	105	73.5
20	EP-3	0.61	0.762	0.076	5.46	3.59	3.321	2.42	55.01	54.61	261	7.5	8.37	221	173.8
21	EP-4	0.61	0.762	0.076	5.275	3.314	3.184	2.442	27.3	26.9	131	3.69	4.12	111	86.2
22	EP-4-1	0.61	0.762	0.076	5.33	3.506	3.499	2.243	9.1	8.7	37	1.2	1.34	31	26.2
23	EP-4-2	0.61	0.762	0.076	5.38	4.172	4.008	1.706	5.43	5.03	14	0.69	0.78	11	12.5
24	EP-5-1	0.61	0.762	0.076	5.22	3.201	3.184	2.443	15.3	14.9	73	2.05	2.29	62	47.8
	Total								810		5390	110	122	4810	2970
1	AP-5	0.762	0.94	0.089	5.03	2.309	2.138	3.265	87.49	87.09	732	14.74	19.7	637	366.3
2	BP-1	0.762	0.94	0.089	5.232	2.081	1.914	3.693	85.78	85.38	879	14.45	19.31	786	395.6
	Total								174		1620	29.2	39.1	1430	762
1	AP-6	0.914	1.118	0.102	4.82	2.134	1.952	3.269	93.6	93.2	839	18.76	28.14	701	408.9
2	BP-2	0.914	1.118	0.102	5.03	1.91	1.739	3.697	87.49	87.09	956	17.53	26.3	827	419.4
3	CP-10	0.914	1.118	0.102	5.232	2.702	2.535	3.105	85.78	85.38	708	17.19	25.78	581	360.6
4	DP-5	0.914	1.118	0.102	4.983	3.065	3.039	2.423	37.88	37.48	212	7.55	11.32	156	132.8
5	DP-6	0.914	1.118	0.102	4.898	3.036	2.868	2.438	85.88	85.48	488	17.21	25.81	361	304
6	DP-7	0.914	1.118	0.102	5.145	2.865	2.722	2.843	150	149.6	1081	30.11	45.17	859	592.6
7	DP-8	0.914	1.118	0.102	5.069	2.719	2.543	2.93	90	89.6	679	18.04	27.06	546	362.8
8	DP-8-1	0.914	1.118	0.102	4.872	2.9	2.722	2.553	90	89.6	548	18.04	27.06	415	329
9	EP-5	0.914	1.118	0.102	5.055	3.179	2.872	2.521	145	144.6	868	29.1	43.66	653	526.2
	Total								866		6380	174	261	5100	3440
1	BP-3	1.219	1.473	0.127	4.82	1.735	1.599	3.74	93.6	93.2	1166	27.46	46.55	933	485.9
2	BP-4	1.219	1.473	0.127	4.711	1.595	1.564	3.718	20	19.6	243	5.78	9.79	194	101.8
3	BP-5-1	1.219	1.473	0.127	4.711	1.573	1.564	3.729	6	5.6	70	1.65	2.8	56	29.2
4	CP-11	1.219	1.473	0.127	5.03	2.531	2.403	3.15	87.49	87.09	837	25.66	43.5	619	402.7
5	CP-12	1.219	1.473	0.127	4.82	2.399	2.217	3.099	93.6	93.2	873	27.46	46.55	640	426.2
6	DP-10	1.219	1.473	0.127	4.778	2.284	2.101	3.172	90.6	90.2	876	26.58	45.05	650	419
7	DP-9	1.219	1.473	0.127	4.932	2.539	2.288	3.105	130.5	130.1	1223	38.33	64.98	898	595.6
8	EP-6	1.219	1.473	0.127	4.89	2.869	2.812	2.636	58	57.6	424	16.97	28.77	280	236.7
	Total								580		5720	170	288	4270	2700

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Pipe culvert 1219 mm	Pay Item No. (BOQ)	2H-0504
Quantity Item	Installation drainage pipe	Unit	m

Calculation Procedure Applied

Length of drainage pipe was computed for pipe culvert 1219 mm.

References, Calculation Base and Revisions

See the item of excavation and disposal of 457mm (2H-0101)

Rev	Prepared by	Prepared Date	No. of Pages	Checked by	Checked Date	Reviewed by	Reviewed Date	Superseded by Calc No.
0	Koba Gonza			Mr. Inuma		Mr. Ando		
1								
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FN : Calculation_Cover_Sheet_020504_seg cover

		D_{in} (m)	D_{out} (m)	t (m)	G (m)	Y_{in} (m)	Y_{out} (m)	H (m)	L (m)	Lac (m)	Vex (m3)	Vcs (m3)	Vlo (m3)	Vbf (m3)	Cmpct (m2)
1	CP-1	0.457	0.584	0.064	5.55	3.599	3.545	2.312	17	16.6	67	1.46	1.47	60	48.1
2	CP-2	0.457	0.584	0.064	5.487	3.543	3.505	2.297	20	19.6	78	1.72	1.74	70	56.5
3	CP-3	0.457	0.584	0.064	5.437	3.503	3.431	2.304	35	34.6	139	3.04	3.06	124	100
4	CP-4	0.457	0.584	0.064	5.537	3.429	3.391	2.461	20	19.6	88	1.72	1.74	80	59.7
5	CP-4-1	0.457	0.584	0.064	5.487	3.469	3.431	2.371	20	19.6	83	1.72	1.74	75	58
6	CP-5	0.457	0.584	0.064	5.637	3.389	3.257	2.648	70	69.6	352	6.1	6.16	321	225
7	CP-5-1	0.457	0.584	0.064	5.637	3.405	3.391	2.573	8	7.6	37	0.67	0.68	34	24
8	CP-7	0.457	0.584	0.064	5.682	2.891	2.824	3.158	35	34.6	237	3.04	3.06	222	129.5
9	CP-8-1	0.457	0.584	0.064	5.507	2.955	2.824	2.951	68	67.6	411	5.93	5.98	381	239
10	CP-8-1-1	0.457	0.584	0.064	5.55	3.019	2.957	2.896	30	29.6	175	2.6	2.62	162	103.1
11	CP-8-2	0.457	0.584	0.064	5.507	2.995	2.957	2.865	20	19.6	114	1.72	1.74	106	67.7
12	CP-8-2-1	0.457	0.584	0.064	5.555	3.021	2.997	2.88	10	9.6	56	0.85	0.85	52	33.3
13	CP-8-3	0.457	0.584	0.064	5.507	3.069	2.997	2.808	35	34.6	194	3.04	3.06	179	117.4
14	CP-8-4	0.457	0.584	0.064	5.507	3.095	3.071	2.758	10	9.6	52	0.85	0.85	48	32.1
15	DP-1	0.457	0.584	0.064	5.875	4.997	4.253	1.584	129.19	128.79	281	11.29	11.39	224	279.3
16	DP-2	0.457	0.584	0.064	5.35	3.347	3.249	2.386	20.82	20.42	87	1.79	1.81	78	60.7
17	DP-3	0.457	0.584	0.064	5.27	3.245	3.226	2.368	24.13	23.73	100	2.08	2.1	90	70.1
18	DP-4-1	0.457	0.584	0.064	5.34	3.247	3.226	2.437	21.75	21.35	94	1.88	1.89	85	64.5
19	DP-7-1	0.457	0.584	0.064	5.17	2.883	2.868	2.628	18.25	17.85	90	1.57	1.58	82	57.4
20	DP-9-1	0.457	0.584	0.064	5.015	2.746	2.543	2.704	150	149.6	784	13.11	13.23	718	491.9
21	DP-9-2	0.457	0.584	0.064	5.01	2.764	2.748	2.588	18.25	17.85	87	1.57	1.58	79	56.7
22	EP-1	0.457	0.584	0.064	6.015	4.097	4.003	2.299	20	19.6	79	1.72	1.74	71	56.6
23	EP-2	0.457	0.584	0.064	5.78	3.997	3.596	2.317	81.47	81.07	328	7.11	7.17	292	235.2
24	EP-2-1	0.457	0.584	0.064	5.97	4.008	4.003	2.298	9.1	8.7	35	0.77	0.77	32	25.1
25	EP-4-3	0.457	0.584	0.064	5.785	4.887	4.176	1.587	142.69	142.29	312	12.47	12.58	249	309
26	EP-4-4	0.457	0.584	0.064	6.195	4.997	4.893	1.584	22	21.6	48	1.9	1.91	39	46.9
27	EP-5-2	0.457	0.584	0.064	5.22	3.211	3.205	2.346	9.1	8.7	36	0.77	0.77	33	25.5
	Total								1,070		4450	92.5	93.3	3990	3080
1	AP-1	0.61	0.762	0.076	5.522	2.644	2.61	3.311	20	19.6	157	2.69	3.01	143	79.9
2	AP-2	0.61	0.762	0.076	5.427	2.606	2.532	3.274	40	39.6	312	5.44	6.07	283	159.9
3	AP-3	0.61	0.762	0.076	5.332	2.528	2.484	3.242	26	25.6	198	3.52	3.92	179	102.6
4	AP-4	0.61	0.762	0.076	5.232	2.48	2.313	3.251	85.78	85.38	663	11.72	13.08	600	342.7
5	AP-5-1	0.61	0.762	0.076	5.132	2.358	2.309	3.214	26	25.6	195	3.52	3.92	176	101.8
6	AP-6-1	0.61	0.762	0.076	4.928	2.182	2.138	3.184	26	25.6	192	3.52	3.92	173	101.1
7	AP-6-2	0.61	0.762	0.076	4.928	2.207	2.186	3.147	12.65	12.25	91	1.69	1.88	82	47.9
8	AP-7-1	0.61	0.762	0.076	4.711	1.997	1.952	3.152	26	25.6	189	3.52	3.92	170	100.2
9	BP-1-1	0.61	0.762	0.076	5.332	2.129	2.085	3.641	26	25.6	241	3.52	3.92	222	112.8
10	BP-2-1	0.61	0.762	0.076	5.132	1.958	1.914	3.612	26	25.6	238	3.52	3.92	219	112
11	BP-3-1	0.61	0.762	0.076	4.928	1.782	1.738	3.584	26	25.6	235	3.52	3.92	216	111.3
12	CP-11-1	0.61	0.762	0.076	5.132	2.579	2.535	2.991	26	25.6	173	3.52	3.92	154	96.1
13	CP-12-1	0.61	0.762	0.076	4.928	2.447	2.403	2.919	26	25.6	167	3.52	3.92	148	94.3
14	CP-13-1	0.61	0.762	0.076	4.711	1.64	1.596	3.509	26	25.6	227	3.52	3.92	208	109.4
15	CP-6	0.61	0.762	0.076	5.747	3.255	3.193	2.939	30	29.6	195	4.06	4.54	173	109.6
16	CP-8	0.61	0.762	0.076	5.42	2.82	2.754	3.049	35	34.6	242	4.75	5.3	216	131.9
17	CP-9	0.61	0.762	0.076	5.332	2.75	2.706	3.02	26	25.6	176	3.52	3.92	157	96.9
18	DP-4	0.61	0.762	0.076	5.34	3.225	3.066	2.61	160	159.6	862	21.9	24.44	743	538.2
19	DP-5-1	0.61	0.762	0.076	5.34	3.087	3.066	2.679	21.75	21.35	121	2.93	3.27	105	73.5
20	EP-3	0.61	0.762	0.076	5.46	3.59	3.321	2.42	55.01	54.61	261	7.5	8.37	221	173.8
21	EP-4	0.61	0.762	0.076	5.275	3.314	3.184	2.442	27.3	26.9	131	3.69	4.12	111	86.2
22	EP-4-1	0.61	0.762	0.076	5.33	3.506	3.499	2.243	9.1	8.7	37	1.2	1.34	31	26.2
23	EP-4-2	0.61	0.762	0.076	5.38	4.172	4.008	1.706	5.43	5.03	14	0.69	0.78	11	12.5
24	EP-5-1	0.61	0.762	0.076	5.22	3.201	3.184	2.443	15.3	14.9	73	2.05	2.29	62	47.8
	Total								810		5390	110	122	4810	2970
1	AP-5	0.762	0.94	0.089	5.03	2.309	2.138	3.265	87.49	87.09	732	14.74	19.7	637	366.3
2	BP-1	0.762	0.94	0.089	5.232	2.081	1.914	3.693	85.78	85.38	879	14.45	19.31	786	395.6
	Total								174		1620	29.2	39.1	1430	762
1	AP-6	0.914	1.118	0.102	4.82	2.134	1.952	3.269	93.6	93.2	839	18.76	28.14	701	408.9
2	BP-2	0.914	1.118	0.102	5.03	1.91	1.739	3.697	87.49	87.09	956	17.53	26.3	827	419.4
3	CP-10	0.914	1.118	0.102	5.232	2.702	2.535	3.105	85.78	85.38	708	17.19	25.78	581	360.6
4	DP-5	0.914	1.118	0.102	4.983	3.065	3.039	2.423	37.88	37.48	212	7.55	11.32	156	132.8
5	DP-6	0.914	1.118	0.102	4.898	3.036	2.868	2.438	85.88	85.48	488	17.21	25.81	361	304
6	DP-7	0.914	1.118	0.102	5.145	2.865	2.722	2.843	150	149.6	1081	30.11	45.17	859	592.6
7	DP-8	0.914	1.118	0.102	5.069	2.719	2.543	2.93	90	89.6	679	18.04	27.06	546	362.8
8	DP-8-1	0.914	1.118	0.102	4.872	2.9	2.722	2.553	90	89.6	548	18.04	27.06	415	329
9	EP-5	0.914	1.118	0.102	5.055	3.179	2.872	2.521	145	144.6	868	29.1	43.66	653	526.2
	Total								866		6380	174	261	5100	3440
1	BP-3	1.219	1.473	0.127	4.82	1.735	1.599	3.74	93.6	93.2	1166	27.46	46.55	933	485.9
2	BP-4	1.219	1.473	0.127	4.711	1.595	1.564	3.718	20	19.6	243	5.78	9.79	194	101.8
3	BP-5-1	1.219	1.473	0.127	4.711	1.573	1.564	3.729	6	5.6	70	1.65	2.8	56	29.2
4	CP-11	1.219	1.473	0.127	5.03	2.531	2.403	3.15	87.49	87.09	837	25.66	43.5	619	402.7
5	CP-12	1.219	1.473	0.127	4.82	2.399	2.217	3.099	93.6	93.2	873	27.46	46.55	640	426.2
6	DP-10	1.219	1.473	0.127	4.778	2.284	2.101	3.172	90.6	90.2	876	26.58	45.05	650	419
7	DP-9	1.219	1.473	0.127	4.932	2.539	2.288	3.105	130.5	130.1	1223	38.33	64.98	898	595.6
8	EP-6	1.219	1.473	0.127	4.89	2.869	2.812	2.636	58	57.6	424	16.97	28.77	280	236.7
	Total								580		5720	170	288	4270	2700

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	Pipe culvert 1219 mm	Pay Item No. (BOQ)	2H-0505 01
Quantity Item	Backfill sand	Unit	m^3

Calculation Procedure Applied

Volume of backfill sand was computed by excavation volume minus pipe culvert volume, base concrete volume and crushed stone volume.

References, Calculation Base and Revisions

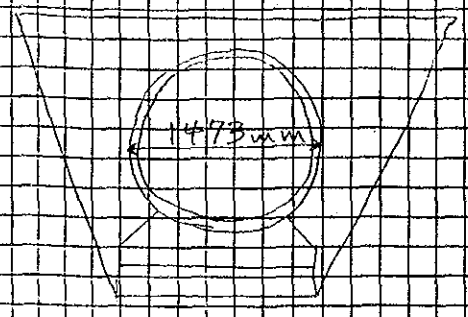
See the form of excavation and disposal [illegible]

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

FN : Calculation_Cover_Sheet_020504_seg cover

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Pipe culvert 1219 mm	Calc. Index No.	
Subject	Backfill sand	Page No.	Rev.

References/ Notes



Pipe culvert volume

$$V_p = (0.7365)^2 \times \pi \times L$$

$$V = V_{Ex} - V_p - V_{lc} - V_{cs}$$

V_{ES} : Volume of excavation

V_{lc} : Volume of lean concrete

V_{cs} : Volume of crushed stone

Prepared by				Checked by		
			/ /200			/ /200

Pipe Culvert集計

		D_{in} (m)	D_{out} (m)	t (m)	G (m)	Y_{in} (m)	Y_{out} (m)	H (m)	L (m)	Lac (m)	Vex (m3)	Vos (m3)	Vlc (m3)	Vbf (m3)	Cmpct (m2)
1	CP-1	0.457	0.584	0.064	5.55	3.599	3.545	2.312	17	16.6	67	1.46	1.47	60	48.1
2	CP-2	0.457	0.584	0.064	5.487	3.543	3.505	2.297	20	19.6	78	1.72	1.74	70	56.5
3	CP-3	0.457	0.584	0.064	5.437	3.503	3.431	2.304	35	34.6	139	3.04	3.06	124	100
4	CP-4	0.457	0.584	0.064	5.537	3.429	3.391	2.461	20	19.6	88	1.72	1.74	80	59.7
5	CP-4-1	0.457	0.584	0.064	5.487	3.469	3.431	2.371	20	19.6	83	1.72	1.74	75	58
6	CP-5	0.457	0.584	0.064	5.637	3.389	3.257	2.648	70	69.6	352	6.1	6.16	321	225
7	CP-5-1	0.457	0.584	0.064	5.637	3.405	3.391	2.573	8	7.6	37	0.67	0.68	34	24
8	CP-7	0.457	0.584	0.064	5.682	2.891	2.824	3.158	35	34.6	237	3.04	3.06	222	129.5
9	CP-8-1	0.457	0.584	0.064	5.507	2.955	2.824	2.951	68	67.6	411	5.93	5.98	381	239
10	CP-8-1-1	0.457	0.584	0.064	5.55	3.019	2.957	2.896	30	29.6	175	2.6	2.62	182	103.1
11	CP-8-2	0.457	0.584	0.064	5.507	2.995	2.957	2.865	20	19.6	114	1.72	1.74	106	67.7
12	CP-8-2-1	0.457	0.584	0.064	5.555	3.021	2.997	2.88	10	9.6	56	0.85	0.85	52	33.3
13	CP-8-3	0.457	0.584	0.064	5.507	3.069	2.997	2.808	35	34.6	194	3.04	3.06	179	117.4
14	CP-8-4	0.457	0.584	0.064	5.507	3.095	3.071	2.758	10	9.6	52	0.85	0.85	48	32.1
15	DP-1	0.457	0.584	0.064	5.875	4.997	4.253	1.584	129.19	128.79	281	11.29	11.39	224	279.3
16	DP-2	0.457	0.584	0.064	5.35	3.347	3.249	2.386	20.82	20.42	87	1.79	1.81	78	60.7
17	DP-3	0.457	0.584	0.064	5.27	3.245	3.226	2.368	24.13	23.73	100	2.08	2.1	90	70.1
18	DP-4-1	0.457	0.584	0.064	5.34	3.247	3.226	2.437	21.75	21.35	94	1.88	1.89	85	64.5
19	DP-7-1	0.457	0.584	0.064	5.17	2.883	2.868	2.628	18.25	17.85	90	1.57	1.58	82	57.4
20	DP-9-1	0.457	0.584	0.064	5.015	2.746	2.543	2.704	150	149.6	784	13.11	13.23	718	491.9
21	DP-9-2	0.457	0.584	0.064	5.01	2.764	2.748	2.588	18.25	17.85	87	1.57	1.58	79	56.7
22	EP-1	0.457	0.584	0.064	6.015	4.097	4.003	2.299	20	19.6	79	1.72	1.74	71	56.6
23	EP-2	0.457	0.584	0.064	5.78	3.997	3.596	2.317	81.47	81.07	328	7.11	7.17	292	235.2
24	EP-2-1	0.457	0.584	0.064	5.97	4.008	4.003	2.298	9.1	8.7	35	0.77	0.77	32	25.1
25	EP-4-3	0.457	0.584	0.064	5.785	4.867	4.176	1.587	142.69	142.29	312	12.47	12.58	249	309
26	EP-4-4	0.457	0.584	0.064	6.195	4.997	4.893	1.584	22	21.6	48	1.9	1.91	39	46.9
27	EP-5-2	0.457	0.584	0.064	5.22	3.211	3.205	2.346	9.1	8.7	36	0.77	0.77	33	25.5
	Total								1,070		4450	92.5	93.3	3990	3080
1	AP-1	0.61	0.762	0.076	5.522	2.644	2.61	3.311	20	19.6	157	2.69	3.01	143	79.9
2	AP-2	0.61	0.762	0.076	5.427	2.606	2.532	3.274	40	39.6	312	5.44	6.07	283	159.9
3	AP-3	0.61	0.762	0.076	5.332	2.528	2.484	3.242	26	25.6	198	3.52	3.92	179	102.6
4	AP-4	0.61	0.762	0.076	5.232	2.48	2.313	3.251	85.78	85.38	663	11.72	13.08	600	342.7
5	AP-5-1	0.61	0.762	0.076	5.132	2.358	2.309	3.214	26	25.6	195	3.52	3.92	176	101.8
6	AP-6-1	0.61	0.762	0.076	4.928	2.182	2.138	3.184	26	25.6	192	3.52	3.92	173	101.1
7	AP-6-2	0.61	0.762	0.076	4.928	2.207	2.186	3.147	12.65	12.25	91	1.69	1.88	82	47.9
8	AP-7-1	0.61	0.762	0.076	4.711	1.997	1.952	3.152	26	25.6	189	3.52	3.92	170	100.2
9	BP-1-1	0.61	0.762	0.076	5.332	2.129	2.085	3.641	26	25.6	241	3.52	3.92	222	112.8
10	BP-2-1	0.61	0.762	0.076	5.132	1.958	1.914	3.612	26	25.6	238	3.52	3.92	219	112
11	BP-3-1	0.61	0.762	0.076	4.928	1.782	1.738	3.584	26	25.6	235	3.52	3.92	216	111.3
12	CP-11-1	0.61	0.762	0.076	5.132	2.579	2.535	2.991	26	25.6	173	3.52	3.92	154	96.1
13	CP-12-1	0.61	0.762	0.076	4.928	2.447	2.403	2.919	26	25.6	167	3.52	3.92	148	94.3
14	CP-13-1	0.61	0.762	0.076	4.711	1.64	1.596	3.509	26	25.6	227	3.52	3.92	208	109.4
15	CP-6	0.61	0.762	0.076	5.747	3.255	3.193	2.939	30	29.6	195	4.06	4.54	173	109.6
16	CP-8	0.61	0.762	0.076	5.42	2.82	2.754	3.049	35	34.6	242	4.75	5.3	216	131.9
17	CP-9	0.61	0.762	0.076	5.332	2.75	2.706	3.02	26	25.6	176	3.52	3.92	157	96.9
18	DP-4	0.61	0.762	0.076	5.34	3.225	3.066	2.61	160	159.6	862	21.9	24.44	743	538.2
19	DP-5-1	0.61	0.762	0.076	5.34	3.087	3.066	2.679	21.75	21.35	121	2.93	3.27	105	73.5
20	EP-3	0.61	0.762	0.076	5.46	3.59	3.321	2.42	55.01	54.61	261	7.5	8.37	221	173.8
21	EP-4	0.61	0.762	0.076	5.275	3.314	3.184	2.442	27.3	26.9	131	3.69	4.12	111	86.2
22	EP-4-1	0.61	0.762	0.076	5.33	3.506	3.499	2.243	9.1	8.7	37	1.2	1.34	31	26.2
23	EP-4-2	0.61	0.762	0.076	5.38	4.172	4.008	1.706	5.43	5.03	14	0.69	0.78	11	12.5
24	EP-5-1	0.61	0.762	0.076	5.22	3.201	3.184	2.443	15.3	14.9	73	2.05	2.29	62	47.8
	Total								810		5390	110	122	4810	2970
1	AP-5	0.762	0.94	0.089	5.03	2.309	2.138	3.265	87.49	87.09	732	14.74	19.7	637	366.3
2	BP-1	0.762	0.94	0.089	5.232	2.081	1.914	3.693	85.78	85.38	879	14.45	19.31	786	395.6
	Total								174		1620	29.2	39.1	1430	762
1	AP-6	0.914	1.118	0.102	4.82	2.134	1.952	3.269	93.6	93.2	839	18.76	28.14	701	408.9
2	BP-2	0.914	1.118	0.102	5.03	1.91	1.739	3.697	87.49	87.09	956	17.53	26.3	827	419.4
3	CP-10	0.914	1.118	0.102	5.232	2.702	2.535	3.105	85.78	85.38	708	17.19	25.78	581	360.6
4	DP-5	0.914	1.118	0.102	4.983	3.065	3.039	2.423	37.88	37.48	212	7.55	11.32	156	132.8
5	DP-6	0.914	1.118	0.102	4.898	3.036	2.868	2.438	85.88	85.48	488	17.21	25.81	361	304
6	DP-7	0.914	1.118	0.102	5.145	2.865	2.722	2.843	150	149.6	1081	30.11	45.17	859	592.6
7	DP-8	0.914	1.118	0.102	5.069	2.719	2.543	2.93	90	89.6	679	18.04	27.06	546	362.8
8	DP-8-1	0.914	1.118	0.102	4.872	2.9	2.722	2.553	90	89.6	548	18.04	27.06	415	329
9	EP-5	0.914	1.118	0.102	5.055	3.179	2.872	2.521	145	144.6	868	29.1	43.66	653	526.2
	Total								866		6380	174	261	5100	3440
1	BP-3	1.219	1.473	0.127	4.82	1.735	1.599	3.74	93.6	93.2	1166	27.46	46.55	933	485.9
2	BP-4	1.219	1.473	0.127	4.711	1.595	1.564	3.718	20	19.6	243	5.78	9.79	194	101.8
3	BP-5-1	1.219	1.473	0.127	4.711	1.573	1.564	3.729	6	5.6	70	1.65	2.8	56	29.2
4	CP-11	1.219	1.473	0.127	5.03	2.531	2.403	3.15	87.49	87.09	837	25.66	43.5	619	402.7
5	CP-12	1.219	1.473	0.127	4.82	2.399	2.217	3.099	93.6	93.2	873	27.46	46.55	640	426.2
6	DP-10	1.219	1.473	0.127	4.778	2.284	2.101	3.172	90.6	90.2	876	26.58	45.05	650	419
7	DP-9	1.219	1.473	0.127	4.932	2.539	2.288	3.105	130.5	130.1	1223	38.33	64.98	898	595.6
8	EP-6	1.219	1.473	0.127	4.89	2.869	2.812	2.636	58	57.6	424	16.97	28.77	280	236.7
	Total								580		5720	170	288	4270	2700

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	Pipe culvert 1219mm	Pay Item No. (BOQ)	2H-050302
Quantity Item	Compaction	Unit	m^2

Calculation Procedure Applied

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

References, Calculation Base and Revisions

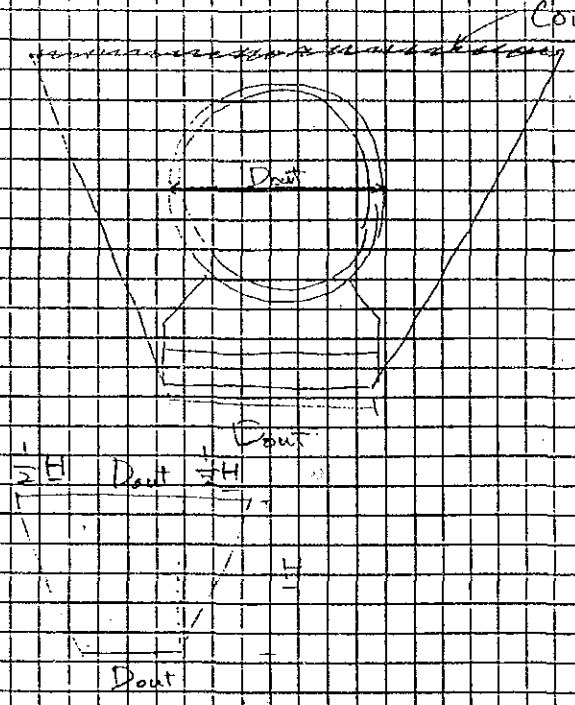
See the item of excavation and disposal of 1219mm (2H-0101).

Rev	Prepared by	Prepared Date	No. of Pages	Checked by	Checked Date	Reviewed by	Reviewed Date	Superseded by Calc No.
0	Kaila Gonza			Mr. Inuma		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	Pipe culvert 1219 mm	Calc. Index No.	
Subject	Compaction	Page No.	Rev.

References/ Notes



Compaction length

$$L = \frac{1}{2}H + D_{out} + \frac{1}{2}H$$

$$= H + D_{out}$$

Compaction area

$$A = (H + D_{out}) \times L_{ac}$$

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			/ /200				/ /200

		D_{in} (m)	D_{out} (m)	t (m)	G (m)	Y_{in} (m)	Y_{out} (m)	H (m)	L (m)	Lac (m)	Vex (m3)	Vcs (m3)	Vlc (m3)	Vbf (m3)	Cmpot (m2)
1	CP-1	0.457	0.584	0.064	5.55	3.599	3.545	2.312	17	16.6	67	1.46	1.47	60	48.1
2	CP-2	0.457	0.584	0.064	5.487	3.543	3.505	2.297	20	19.6	78	1.72	1.74	70	56.5
3	CP-3	0.457	0.584	0.064	5.437	3.503	3.431	2.304	35	34.6	139	3.04	3.06	124	100
4	CP-4	0.457	0.584	0.064	5.537	3.429	3.391	2.461	20	19.6	88	1.72	1.74	80	59.7
5	CP-4-1	0.457	0.584	0.064	5.487	3.469	3.431	2.371	20	19.6	83	1.72	1.74	75	58
6	CP-5	0.457	0.584	0.064	5.637	3.389	3.257	2.648	70	69.6	352	6.1	6.16	321	225
7	CP-5-1	0.457	0.584	0.064	5.637	3.405	3.391	2.573	8	7.6	37	0.67	0.68	34	24
8	CP-7	0.457	0.584	0.064	5.682	2.891	2.824	3.158	35	34.6	237	3.04	3.06	222	129.5
9	CP-8-1	0.457	0.584	0.064	5.507	2.955	2.824	2.951	68	67.6	411	5.93	5.98	381	239
10	CP-8-1-1	0.457	0.584	0.064	5.55	3.019	2.957	2.896	30	29.6	175	2.6	2.62	162	103.1
11	CP-8-2	0.457	0.584	0.064	5.507	2.995	2.957	2.865	20	19.6	114	1.72	1.74	106	67.7
12	CP-8-2-1	0.457	0.584	0.064	5.555	3.021	2.997	2.88	10	9.6	56	0.85	0.85	52	33.3
13	CP-8-3	0.457	0.584	0.064	5.507	3.069	2.997	2.808	35	34.6	194	3.04	3.06	179	117.4
14	CP-8-4	0.457	0.584	0.064	5.507	3.095	3.071	2.758	10	9.6	52	0.85	0.85	48	32.1
15	DP-1	0.457	0.584	0.064	5.875	4.997	4.253	1.584	129.19	128.79	281	11.29	11.39	224	279.3
16	DP-2	0.457	0.584	0.064	5.35	3.347	3.249	2.386	20.82	20.42	87	1.79	1.81	78	60.7
17	DP-3	0.457	0.584	0.064	5.27	3.245	3.226	2.368	24.13	23.73	100	2.08	2.1	90	70.1
18	DP-4-1	0.457	0.584	0.064	5.34	3.247	3.226	2.437	21.75	21.35	94	1.88	1.89	85	64.5
19	DP-7-1	0.457	0.584	0.064	5.17	2.883	2.868	2.628	18.25	17.85	90	1.57	1.58	82	57.4
20	DP-9-1	0.457	0.584	0.064	5.015	2.746	2.543	2.704	150	149.6	784	13.11	13.23	718	491.9
21	DP-9-2	0.457	0.584	0.064	5.01	2.764	2.748	2.588	18.25	17.85	87	1.57	1.58	79	56.7
22	EP-1	0.457	0.584	0.064	6.015	4.097	4.003	2.299	20	19.6	79	1.72	1.74	71	56.6
23	EP-2	0.457	0.584	0.064	5.78	3.997	3.596	2.317	81.47	81.07	328	7.11	7.17	292	235.2
24	EP-2-1	0.457	0.584	0.064	5.97	4.008	4.003	2.298	9.1	8.7	35	0.77	0.77	32	25.1
25	EP-4-3	0.457	0.584	0.064	5.785	4.887	4.176	1.587	142.69	142.29	312	12.47	12.58	249	309
26	EP-4-4	0.457	0.584	0.064	6.195	4.997	4.893	1.584	22	21.6	48	1.9	1.91	39	46.9
27	EP-5-2	0.457	0.584	0.064	5.22	3.211	3.205	2.346	9.1	8.7	36	0.77	0.77	33	25.5
	Total								1,070		4450	92.5	93.3	3990	3080
1	AP-1	0.61	0.762	0.076	5.522	2.644	2.61	3.311	20	19.6	157	2.69	3.01	143	79.9
2	AP-2	0.61	0.762	0.076	5.427	2.606	2.532	3.274	40	39.6	312	5.44	6.07	283	159.9
3	AP-3	0.61	0.762	0.076	5.332	2.528	2.484	3.242	26	25.6	198	3.52	3.92	179	102.6
4	AP-4	0.61	0.762	0.076	5.232	2.48	2.313	3.251	85.78	85.38	663	11.72	13.08	600	342.7
5	AP-5-1	0.61	0.762	0.076	5.132	2.358	2.309	3.214	26	25.6	195	3.52	3.92	176	101.8
6	AP-6-1	0.61	0.762	0.076	4.928	2.182	2.138	3.184	26	25.6	192	3.52	3.92	173	101.1
7	AP-6-2	0.61	0.762	0.076	4.928	2.207	2.186	3.147	12.65	12.25	91	1.69	1.88	82	47.9
8	AP-7-1	0.61	0.762	0.076	4.711	1.997	1.952	3.152	26	25.6	189	3.52	3.92	170	100.2
9	BP-1-1	0.61	0.762	0.076	5.332	2.129	2.085	3.641	26	25.6	241	3.52	3.92	222	112.8
10	BP-2-1	0.61	0.762	0.076	5.132	1.958	1.914	3.612	26	25.6	238	3.52	3.92	219	112
11	BP-3-1	0.61	0.762	0.076	4.928	1.782	1.738	3.584	26	25.6	235	3.52	3.92	216	111.3
12	CP-11-1	0.61	0.762	0.076	5.132	2.579	2.535	2.991	26	25.6	173	3.52	3.92	154	96.1
13	CP-12-1	0.61	0.762	0.076	4.928	2.447	2.403	2.919	26	25.6	167	3.52	3.92	148	94.3
14	CP-13-1	0.61	0.762	0.076	4.711	1.64	1.596	3.509	26	25.6	227	3.52	3.92	208	109.4
15	CP-6	0.61	0.762	0.076	5.747	3.255	3.193	2.939	30	29.6	195	4.06	4.54	173	109.6
16	CP-8	0.61	0.762	0.076	5.42	2.82	2.754	3.049	35	34.6	242	4.75	5.3	216	131.9
17	CP-9	0.61	0.762	0.076	5.332	2.75	2.706	3.02	26	25.6	176	3.52	3.92	157	96.9
18	DP-4	0.61	0.762	0.076	5.34	3.225	3.066	2.61	160	159.6	862	21.9	24.44	743	538.2
19	DP-5-1	0.61	0.762	0.076	5.34	3.087	3.066	2.679	21.75	21.35	121	2.93	3.27	105	73.5
20	EP-3	0.61	0.762	0.076	5.46	3.59	3.321	2.42	55.01	54.61	261	7.5	8.37	221	173.8
21	EP-4	0.61	0.762	0.076	5.275	3.314	3.184	2.442	27.3	26.9	131	3.69	4.12	111	86.2
22	EP-4-1	0.61	0.762	0.076	5.33	3.506	3.499	2.243	9.1	8.7	37	1.2	1.34	31	26.2
23	EP-4-2	0.61	0.762	0.076	5.38	4.172	4.008	1.706	5.43	5.03	14	0.69	0.78	11	12.5
24	EP-5-1	0.61	0.762	0.076	5.22	3.201	3.184	2.443	15.3	14.9	73	2.05	2.29	62	47.8
	Total								810		5390	110	122	4810	2970
1	AP-5	0.762	0.94	0.089	5.03	2.309	2.138	3.265	87.49	87.09	732	14.74	19.7	637	366.3
2	BP-1	0.762	0.94	0.089	5.232	2.081	1.914	3.693	85.78	85.38	879	14.45	19.31	786	395.6
	Total								174		1620	29.2	39.1	1430	762
1	AP-6	0.914	1.118	0.102	4.82	2.134	1.952	3.269	93.6	93.2	839	18.76	28.14	701	408.9
2	BP-2	0.914	1.118	0.102	5.03	1.91	1.739	3.697	87.49	87.09	956	17.53	26.3	827	419.4
3	CP-10	0.914	1.118	0.102	5.232	2.702	2.535	3.105	85.78	85.38	708	17.19	25.78	581	360.6
4	DP-5	0.914	1.118	0.102	4.983	3.065	3.039	2.423	37.88	37.48	212	7.55	11.32	156	132.8
5	DP-6	0.914	1.118	0.102	4.898	3.036	2.868	2.438	85.88	85.48	488	17.21	25.81	361	304
6	DP-7	0.914	1.118	0.102	5.145	2.865	2.722	2.843	150	149.6	1081	30.11	45.17	859	592.6
7	DP-8	0.914	1.118	0.102	5.069	2.719	2.543	2.93	90	89.6	679	18.04	27.06	546	362.8
8	DP-8-1	0.914	1.118	0.102	4.872	2.9	2.722	2.553	90	89.6	548	18.04	27.06	415	329
9	EP-5	0.914	1.118	0.102	5.055	3.179	2.872	2.521	145	144.6	868	29.1	43.66	653	526.2
	Total								866		6380	174	261	5100	3440
1	BP-3	1.219	1.473	0.127	4.82	1.735	1.599	3.74	93.6	93.2	1166	27.46	46.55	933	485.9
2	BP-4	1.219	1.473	0.127	4.711	1.595	1.564	3.718	20	19.6	243	5.78	9.79	194	101.8
3	BP-5-1	1.219	1.473	0.127	4.711	1.573	1.564	3.729	6	5.6	70	1.65	2.8	56	29.2
4	CP-11	1.219	1.473	0.127	5.03	2.531	2.403	3.15	87.49	87.09	837	25.66	43.5	619	402.7
5	CP-12	1.219	1.473	0.127	4.82	2.399	2.217	3.099	93.6	93.2	873	27.46	46.55	640	426.2
6	DP-10	1.219	1.473	0.127	4.778	2.284	2.101	3.172	90.6	90.2	876	26.58	45.05	650	419
7	DP-9	1.219	1.473	0.127	4.932	2.539	2.288	3.105	130.5	130.1	1223	38.33	64.98	898	595.6
8	EP-6	1.219	1.473	0.127	4.89	2.869	2.812	2.636	58	57.6	424	16.97	28.77	280	236.7
	Total								580		5720	170	288	4270	2700

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Diversion canal type A	Pay Item No. (BOQ)	2H - 0601
Quantity Item	Excavation and Disposal	Unit	m^3

Calculation Procedure Applied

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

References. Calculation Base and Revisions

DW - S1 - 01 - 022

Rev	Prepared by	Prepared Date	No. of Pages	Checked by	Checked Date	Reviewed by	Reviewed Date	Superseded by Calc No.
0	Kala Garza			Mr. Inuma		Mr. Ando		
1								
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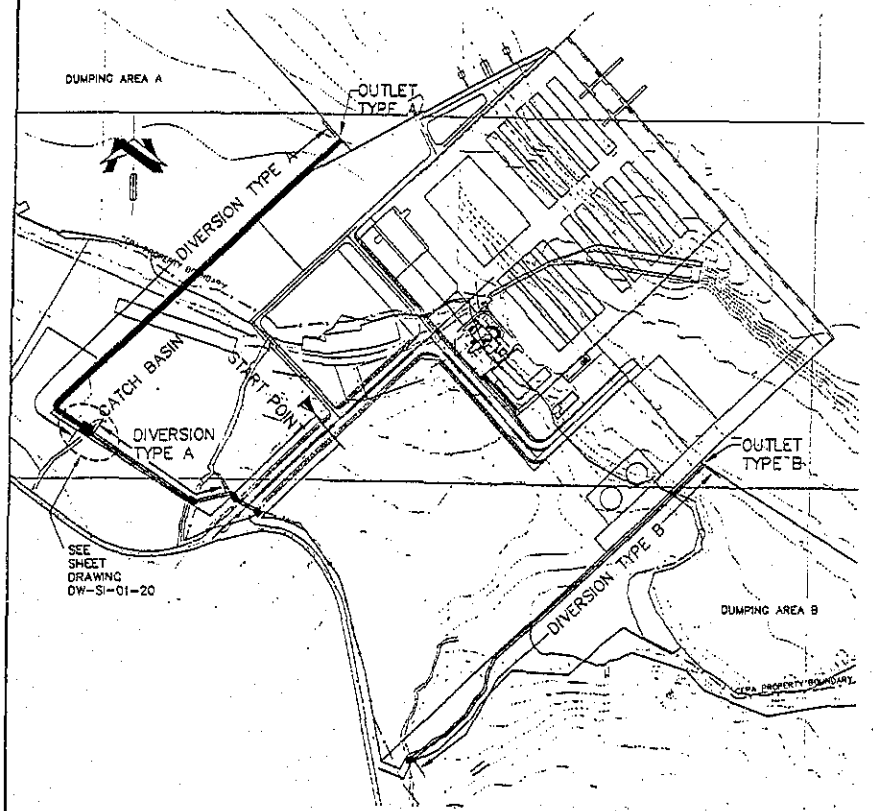
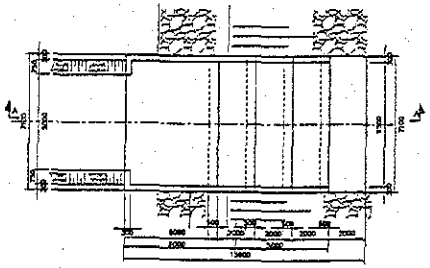
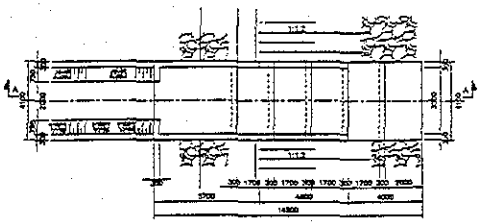


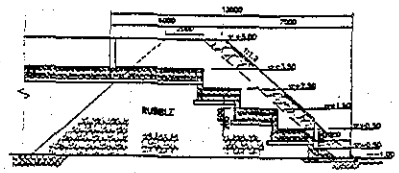
PLAN OF DIVERSION DRAINAGE
SCALE 1:6,500



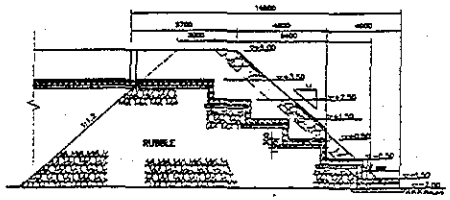
PLAN OUTLET TYPE B
SCALE 1:250



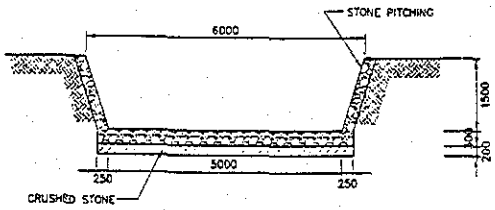
PLAN OUTLET TYPE A
SCALE 1:250



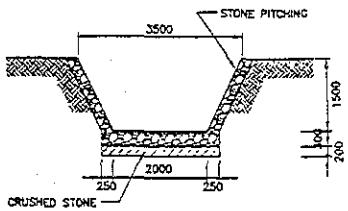
SECTION A–A OUTLET TYPE B
SCALE 1:250



SECTION A–A OUTLET TYPE A
SCALE 1:250



DIVERSION TYPE A
SCALE 1:100



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

JICA — JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

CEPA — COMISION EJECUTIVA PORTUARIA AUTONOMA (CEPA)

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

NIPPON KOEI CO., LTD.

DESIGNED BY :
CHECKED BY :
APPROVED BY :

SECTION : STORM DRAINAGE
SUB-SECTION : PROFILE AND DETAILS
TITLE :

DIVERSION DRAINAGE (1/2)

DATE : JULY/2002
SCALE : INDICATED
DRAWING NO. DW-SI-01-022

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

References/ Notes

$A = (6.5 + 5.5) \times 1.5 \div 2 + 0.5 \times 5.5$

$= 13.375 \ m^2/m$

$= 13.4 \ m^2/m$

$L = 580 \ m$

$V = 13.4 \times 580 = 7772$

$= \boxed{7800} \ m^3$

Prepared by				Checked by		
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NIPPON KOEI CO.,LTD.

QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Diversion canal type A	**Pay Item No. (BOQ)**	2H-060201
Quantity Item	Compaction	**Unit**	m^2

Calculation Procedure Applied

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

References, Calculation Base and Revisions

See the estimation of excavation and disposal 2H-060101

Rev	Prepared by	Prepared Date	No. of Pages	Checked by	Checked Date	Reviewed by	Reviewed Date	Superseded by Calc No.
0	Karla Gordo			Mr. Inoma		Mr. Ando		
1								
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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Diversion canal type A	Calc. Index No.	
Subject	Compaction	Page No.	Rev.

References/ Notes

$b = 16 \times 2 + 5.0 = 8.2\ m$

$L = 580\ m$

$A = 8.2 \times 580 = 4756$

$\simeq \boxed{4800}\ m$

		Prepared by		Checked by	
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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Diversion canal type A	Pay Item No. (BOQ)	2H-060202
Quantity Item	Clay	Unit	m^3

Calculation Procedure Applied

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

References, Calculation Base and Revisions

See the item of excavation and disposal. (2H-0601)

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

References/ Notes

Compaction area 4800 m^2

Thickness $t = 5cm$

$V = 4800 \times 0.05 = \boxed{240}\ m^3$

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Diversion canal type A	**Pay Item No. (BOQ)**	2H-060203
Quantity Item	Rubble	**Unit**	m^3

Calculation Procedure Applied

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

References, Calculation Base and Revisions

See the 'Form of excavation and disposal' (2H-0601).

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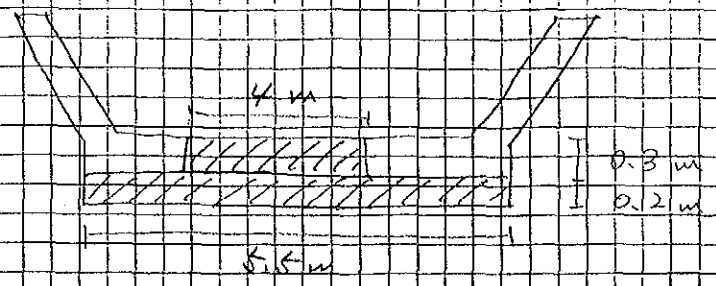
Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Diversion canal type A	Calc. Index No.	
Subject	Rubble.	Page No.	Rev.

References/ Notes



$A = 0.3 \times 4.0 + 0.2 \times 5.5$

$= 2.3\ m^2$

$L = 580\ m$

$V = 2.3 \times 580 = 1,334$

$\simeq \boxed{1,340}\ m^3$

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Diversion canal type A	Pay Item No. (BOQ)	2H - 060204
Quantity Item	Masonry cement	Unit	M3

Calculation Procedure Applied

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

References, Calculation Base and Revisions

See the item of excavation and disposal (2H - 060101)

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0	Karla Garcia			Mr. Inuma		Mr. Ando		
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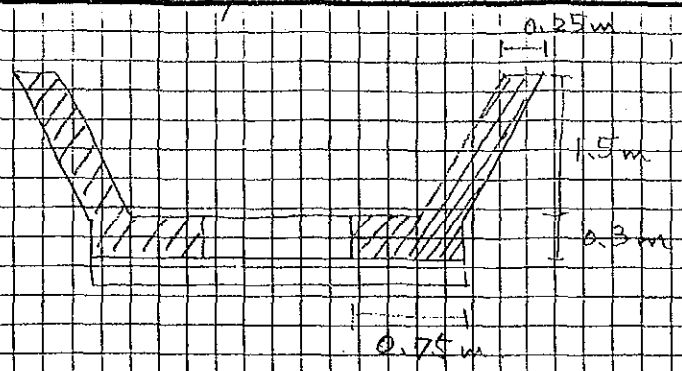
Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Diversion canal type A	Calc. Index No.	
Subject	Masonry cement	Page No.	Rev.

References/ Notes



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

$= 1.2\ m^2$

$L = 580\ m$

$V = 1.2 \times 580 = \boxed{696}\ m^3$

Prepared by		Checked by	
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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Outlet type A	Pay Item No. (BOQ)	2H-060301
Quantity Item	Excavation and Disposal	Unit	m³

Calculation Procedure Applied

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

References, Calculation Base and Revisions

See the item of excavation and disposal. (2H-060301)

Rev	Prepared by	Prepared Date	No. of Pages	Checked by	Checked Date	Reviewed by	Reviewed Date	Superseded by Calc No.
0	Karla Garcia			Mr. Inuma		Mr. Ando		
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FN : Calculation_Cover_Sheet_020504_seg cover

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

References/ Notes

$(8.5 + 3.0) \times 2.3 \div 2 = 13.225 \ m^2$

$(5.5 + 4.3) \times 1.0 \div 2 = 4.9 \ m^2$

$(4.9 + 3.5) \times 1.0 \div 2 = 4.2 \ m^2$

$(4.0 + 2.9) \times 1.0 \div 2 = 3.45 \ m^2$

$(2.9 + 2.0) \times 1.0 \div 2 = 2.45 \ m^2$

$3 \times 0.3 = 0.9 \ m^2$

$A = 29.125 \ m^2$

$\simeq 29.2 \ m^2$

width 7.1 m.

$V = 29.2 \times 7.1 = 207.32$

$\simeq \boxed{208} \ m^3$

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	Outlet type A	Pay Item No. (BOQ)	2H-060302
Quantity Item	Compaction	Unit	m^2

Calculation Procedure Applied

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

References, Calculation Base and Revisions

See the item of excavation and disposal (2H-060!).

Rev	Prepared by	Prepared Date	No. of Pages	Checked by	Checked Date	Reviewed by	Reviewed Date	Superseded by Calc No.
0	Karla Gonzio			Mr. Inuma		Mr. Ando		
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FN : Calculation_Cover_Sheet_020504_seg cover

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Outlet type A	Calc. Index No.	
Subject	Compaction	Page No.	Rev.

References/ Notes

Side 29.2 × 2 = 58.4 m^2

bottom 17 × 7.1 = 120.7 m^2

179.1 m^2

≒ 180 m^2

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Outlet type A	**Pay Item No. (BOQ)**	2H-060303
Quantity Item	Clay	**Unit**	m^3

Calculation Procedure Applied

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

References, Calculation Base and Revisions

See the item of excavation and disposal (2H-0601).

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Garcia			Mr. Inoma		Mr. Ando		
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2								
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FN : Calculation_Cover_Sheet_020504_seg cover

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Outlet type A	Calc. Index No.	
Subject	Clay	Page No.	Rev.

References/ Notes

Compaction area 180 m²

Clay t = 5 cm

$V = 180 \times 0.05 = \boxed{9.0}$ m³

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Outlet type A	**Pay Item No. (BOQ)**	2H-060304
Quantity Item	Rubble	**Unit**	m^3

Calculation Procedure Applied

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

References, Calculation Base and Revisions

See the item of excavation and disposal (2H-060101).

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Garcia			Mr. Tsuma		Mr. Ando		
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FN : Calculation_Cover_Sheet_020504_seg cover

Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Outlet type A	Calc. Index No.	
Subject	Rubble	Page No.	Rev.

References/ Notes

$A = (4.7 + 2.2 + 2.2 + 2.2 + 3.0) \times 0.2$

$= 2.86\ m^2$

Width 6.5 m

$V = 2.86 \times 6.5 = \boxed{18.6}\ m^3$

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Outlet type A	**Pay Item No. (BOQ)**	2H-060305
Quantity Item	Masonry cement	**Unit**	m^3

Calculation Procedure Applied

Volume of masonry cement for outlet type A was computed by multiplying section area by thickness.

References, Calculation Base and Revisions

See the item of excavation and disposal.
(2H-0601)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
	by	Date		by	Date	by	Date	
0	Karla Gonio			Mr. Inoma		Mr. Ando		
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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Outlet type A	Calc. Index No.	
Subject	Masonry cement	Page No.	Rev.

References/ Notes

Side

$(8.9 + 6.0) \times 2.3 \div 2 = 16.905\ m^2$

$(5.5 + 4.3) \times 1.0 \div 2 = 4.9\ m^2$

$(4.9 + 3.5) \times 1.0 \div 2 = 4.2\ m^2$

$(4.0 + 2.9) \times 1.0 \div 2 = 3.45\ m^2$

$(2.9 + 2.0) \times 1.0 \div 2 = 2.45\ m^2$

$31.905\ m^2$

$V_1 = 31.905 \times 0.3 \times 2 = 19.146\ m^3$

bottom

$(4.5 + 2.0 + 2.0 + 2.0 + 2.5 + 1.0 \times 4) \times 0.5$

$= 8.5\ m^2$

$V_2 = 8.5 \times 0.5 = 55.25\ m^3$

$V = V_1 + V_2 = 74.396$

$\fallingdotseq \boxed{74.4}\ m^3$

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Canal Branch type A-1	**Pay Item No. (BOQ)**	2H-0604.01
Quantity Item	Excavation and Disposal	**Unit**	m^3

Calculation Procedure Applied

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

References, Calculation Basc and Revisions

See the item of excavation and disposal. (2H-0601)

Rev	Prepared by	Prepared Date	No. of Pages	Checked by	Checked Date	Reviewed by	Reviewed Date	Superseded by Calc No.
0	Karla Garcia			Mr. Inuma		Mr. Ando		
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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Canal Branch type A-1	Calc. Index No.	
Subject	Excavation and Disposal	Page No.	Rev.

References/ Notes

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

$= 6.13\ m^2$

$L = 210\ m$

$V = 6.13 \times 210 = 1287.3$

$\simeq \boxed{1300}\ m^3$

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Canal Branch type A-1	**Pay Item No. (BOQ)**	24-060402
Quantity Item	Compaction	**Unit**	m^2

Calculation Procedure Applied

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

References, Calculation Base and Revisions

See the item of excavation and disposal.
(2H-0601)

Rev	Prepared		No. of Pages	Checked		Reviewed		Superseded by Calc No.
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0	Karla Grace [illegible]			Mr. Inoma		Mr. Ando		
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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Canal Branch type A-1	Calc. Index No.	
Subject	Compaction	Page No.	Rev.

References/ Notes

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

$L = 210\ m$

$A = 5.36 \times 210 = 1126$

$\simeq \boxed{1200}\ m^2$

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Canal Branch type A-1	**Pay Item No. (BOQ)**	2H-060403
Quantity Item	Clay	**Unit**	m^3

Calculation Procedure Applied

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

References, Calculation Base and Revisions

See the item of excavation and disposal. (2H-0601).

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0	Kaito Gorria			Mr. Inoma		Mr. Ando		
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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Canal Branch type A-1	Calc. Index No.	
Subject	Clay	Page No.	Rev.

References/ Notes

Compaction area 1200 m^2

Clay t = 5 cm

$V = 1200 \times 0.05 = \boxed{60.0}\ m^3$

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Canal Branch type A-1	**Pay Item No. (BOQ)**	2H-060404
Quantity Item	Rubble	**Unit**	m^3

Calculation Procedure Applied

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

References, Calculation Base and Revisions

See the item of excavation and disposal.
(2H-0601)

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0	Karla Garcia			Mr. Inoma		Mr. Ando		
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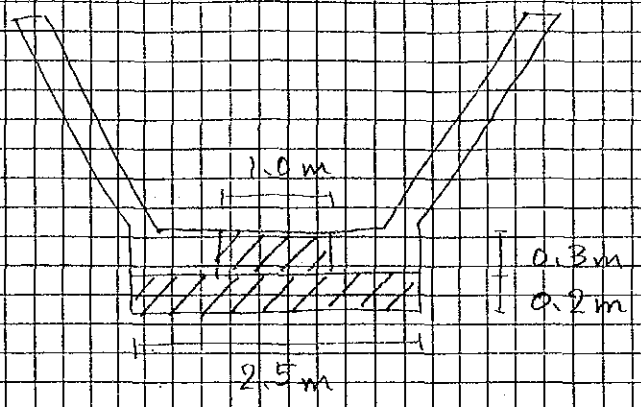
Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Canal Branch type A-1	Calc. Index No.	
Subject	Rubble.	Page No.	Rev.

References/ Notes



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

$L = 210\ m$

$V = 0.8 \times 210 = \boxed{168}\ m^3$

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	Canal Branch Type A-1	**Pay Item No. (BOQ)**	2H-060405
Quantity Item	Masonry cement	**Unit**	m^3

Calculation Procedure Applied

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

References, Calculation Base and Revisions

See the item of excavation and disposal. (2H-0601).

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0	Karla Garcia			Mr. Inoma		Mr. Ando		
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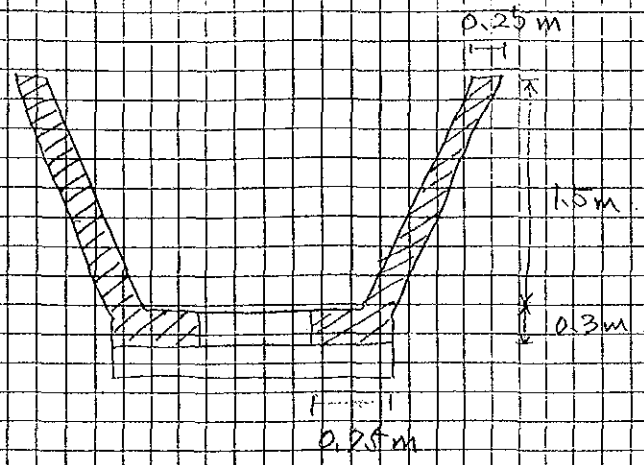
Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	Canal Branch type A-1	Calc. Index No.	
Subject	Masonry cement	Page No.	Rev.

References/ Notes



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

$= 1.2\ m^2$

$L = 210\ m$

$V = 1.2 \times 210 = \boxed{252}\ m^3$

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	U type ditch (A-2)	**Pay Item No. (BOQ)**	2H-060501
Quantity Item	Excavation and Disposal	**Unit**	m^3

Calculation Procedure Applied

Volume of excavation for U type ditch was computed by multiplying sectional area by the length.

References, Calculation Base and Revisions

DW-SD-01-020

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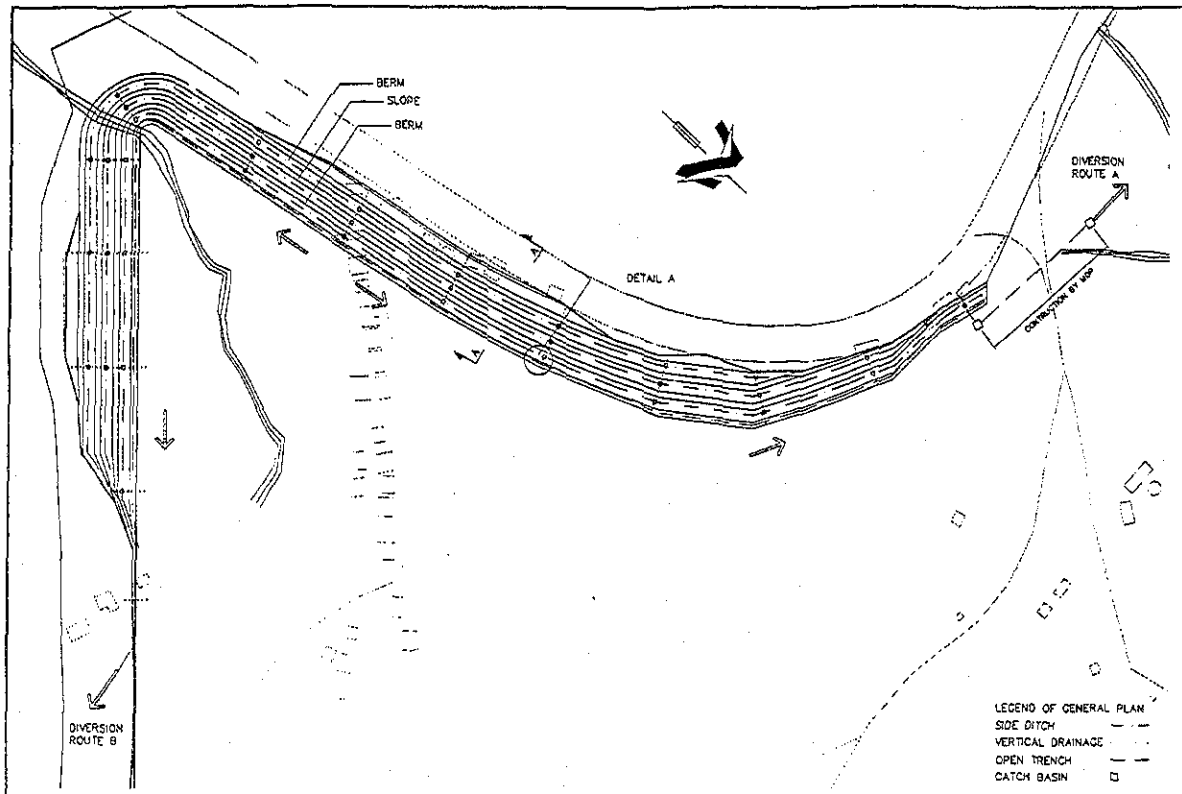
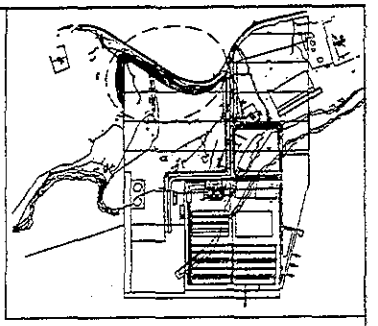
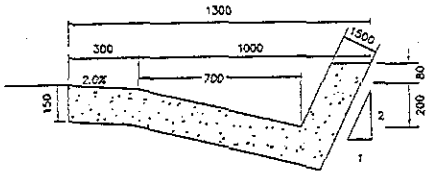


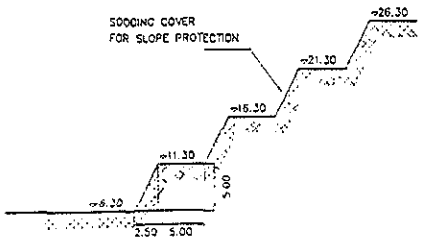
GENERAL PLAN
SCALE 1:2000



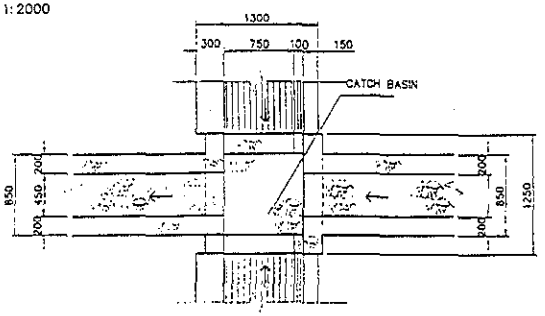
KEY PLAN



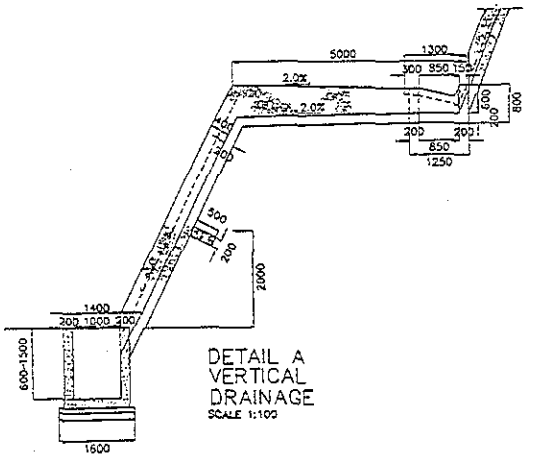
CONCRETE SIDE DITCH
SCALE 1:20



SECTION A–A
GENERAL PROFILE OF SLOPE
SCALE 1:500



DETAIL A
PLAN OF VERTICAL DRAINAGE
SCALE 1:50

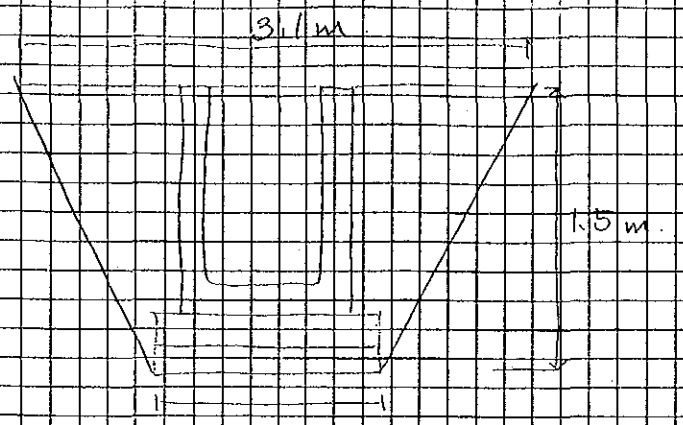


DETAIL A
VERTICAL
DRAINAGE
SCALE 1:100

JICA	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DETAILED DESIGN ON PORT REACTIVATION PROJECT IN LA UNION PROVINCE OF THE REPUBLIC OF EL SALVADOR	DESIGNED BY :	SECTION : STORM DRAINAGE	DATE : JULY/2002
CEPA	COMISION EJECUTIVA PORTUARIA AUTONOMA (CEPA)	NIPPON KOEI CO., LTD.	CHECKED BY :	SUB-SECTION : PROFILE AND DETAILS	SCALE : INDICATED
			APPROVED BY :	TITLE : SLOPE DRAINAGE	DRAWING NO. CW-SD-C1-020

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

References/ Notes



$A = (1.6 + 3.1) \times 1.5 \div 2$

$= 3.525$

$\fallingdotseq 3.53\ m^2$

$L = 270\ m$

$V = 3.53 \times 270 = 953.1$

$\fallingdotseq \boxed{954}\ m^3$

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	U type ditch (A-2)	**Pay Item No. (BOQ)**	2H-060502
Quantity Item	Compaction	**Unit**	m²

Calculation Procedure Applied

Area of compaction for U type ditch was computed by multiplying width by length.

References, Calculation Base and Revisions

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

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

References/ Notes

$A = 1.6 \times 270 = \boxed{432}\ m^2$

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	U type ditch (A-2)	**Pay Item No. (BOQ)**	2H-060503
Quantity Item	Crushed stone	**Unit**	m^3

Calculation Procedure Applied

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

References, Calculation Base and Revisions

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

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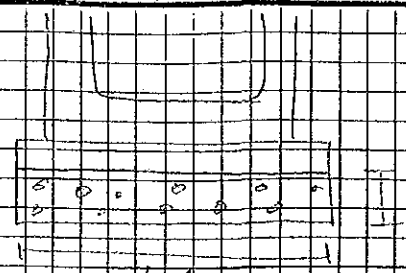
Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	U type ditch (A-2)	Calc. Index No.	
Subject	Crushed stone	Page No.	Rev.

References/ Notes



$V = 0.15 \times 1.6 \times 270$

$= \boxed{64.8}\ m^3$

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	U type ditch (A-2)	**Pay Item No. (BOQ)**	2H - 060504
Quantity Item	Lean concrete	**Unit**	m^3

Calculation Procedure Applied

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

References, Calculation Base and Revisions

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

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0	Kato Gorio			Mr. Inuma		Mr. Ando		
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Project	Detailed Design on Port Reactivation Project in La Union	Calc. File No.	
Section	U type ditch (A-2)	Calc. Index No.	
Subject	Lean concrete	Page No.	Rev.

References/ Notes

$V = 1.6 \times 0.1 \times 270$

$= \boxed{43.2}\ m^3$

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	U type ditch (A-2)	**Pay Item No. (BOQ)**	2H-060505
Quantity Item	Form	**Unit**	m^2

Calculation Procedure Applied

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

References, Calculation Base and Revisions

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

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

References/ Notes

$$A = (1.25 \times 2 + 1.05 \times 2) \times 270$$

$$= 1242$$

$$\simeq \boxed{1250}\ m^2$$

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	**Project Code**	JC1N004/2N001
Work Section Title	U type ditch (A-2)	**Pay Item No. (BOQ)**	2H-060506
Quantity Item	Reinforcement	**Unit**	kg

Calculation Procedure Applied

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

References, Calculation Base and Revisions

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

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0	Kaita Gorto			Mr. Inuma		Mr. Ando		
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TABLE OF REINFORCEMENT (DIVERSION)

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

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QUANTITY CALCULATION COVER SHEET

Project	Detailed Design on Port Reactivation Project in La Union Province	Project Code	JC1N004/2N001
Work Section Title	U type ditch (A-2)	Pay Item No. (BOQ)	2H-060507
Quantity Item	Concrete	Unit	m^3

Calculation Procedure Applied

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

References, Calculation Base and Revisions

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

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

References/ Notes

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

$= 0.7\ m^2$

$V = 0.7 \times 270 = \boxed{189}\ m^3$

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