JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

MINISTRY OF SETTLEMENT AND REGIONAL DEVELOPMENT
THE REPUBLIC OF INDONESIA

THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

FINAL REPORT

COMPONENT C:
URBAN DRAINAGE SYSTEM IMPROVEMENT

VOLUME III WORK QUANTITY CALCULATION

AUGUST 2000

CTI ENGINEERING INTERNATIONAL CO., LTD.
IN ASSOCIATION WITH
PACIFIC CONSULTANTS INTERNATIONAL
AND
PASCO INTERNATIONAL INC.

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CONSTITUTION OF THE REPORT

1. SUMMARY
2. COMPONENT A : WEST FLOODWAY/GARANG RIVER IMPROVEMENT

VOLUME I	MAIN REPORT
VOLUME II	DESIGN CRITERIA
VOLUME III	DESIGN NOTES
VOLUME IV	WORK QUANTITY CALCULATION
VOLUME V	CONSTRUCTION PLANNING
VOLUME VI	COST ESTIMATE
VOLUME VII	DATA BOOK

3. COMPONENT B : JATIBARANG MULTIPURPOSE DAM CONSTRUCTION

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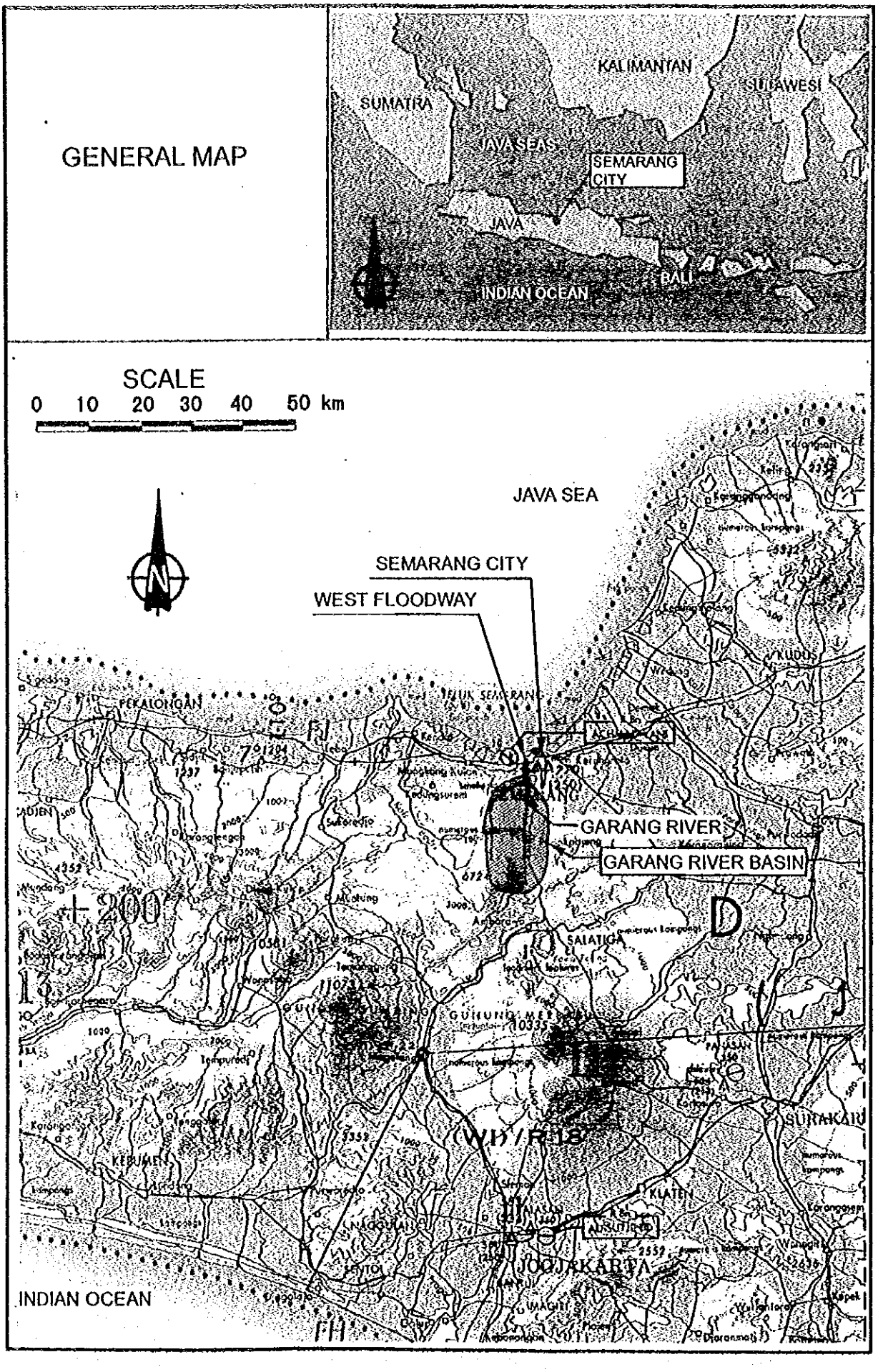
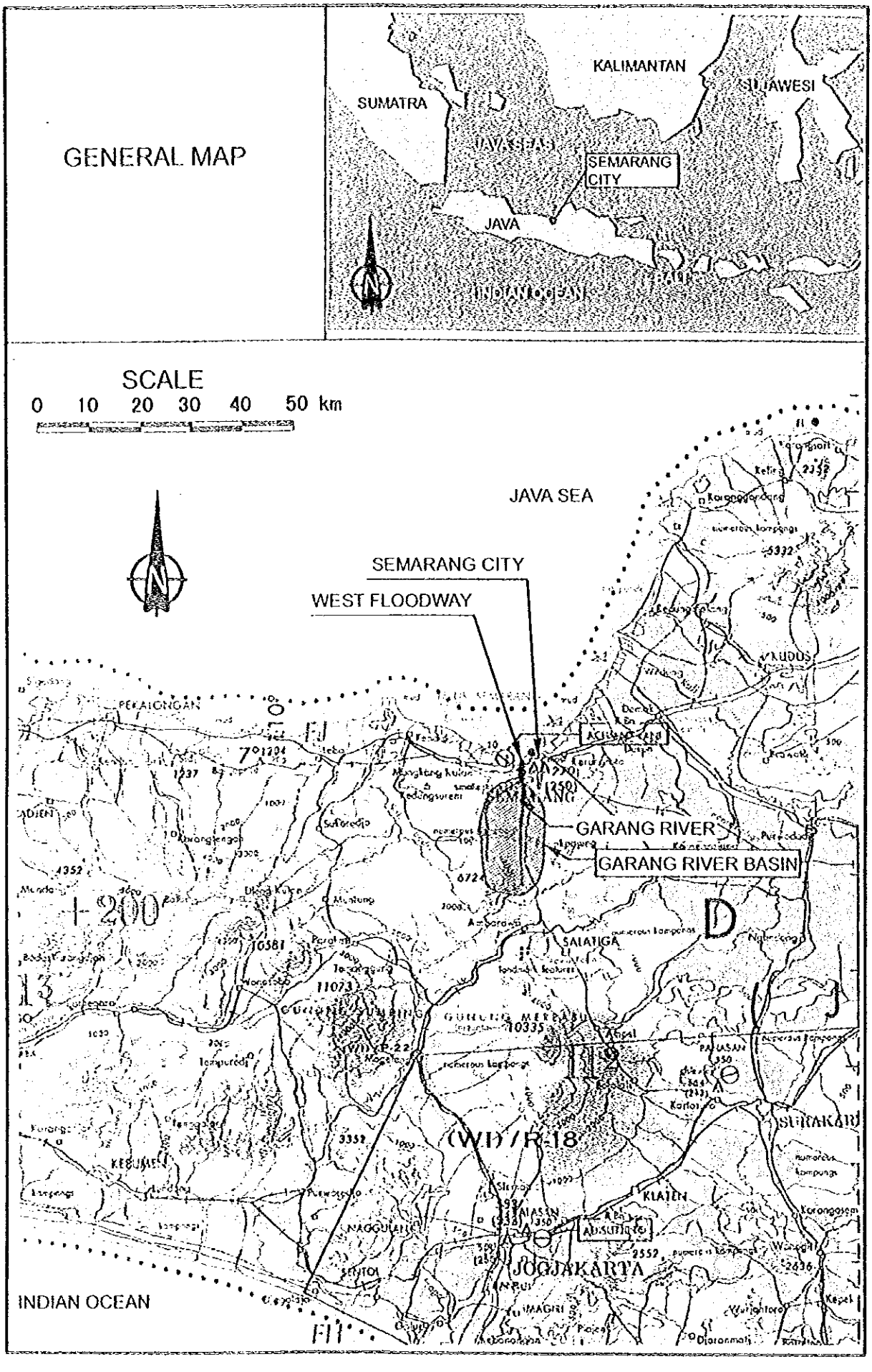
VOLUME I	MAIN REPORT
VOLUME II	DESIGN NOTES
VOLUME III	WORK QUANTITY CALCULATION
VOLUME IV	CONSTRUCTION PLANNING
VOLUME V	COST ESTIMATE
VOLUME VI	DATA BOOK


GENERAL MAP
KALIMANTAN
SUMATRA
SULAWESI
JAVA SEAS
SEMARANG CITY
JAVA
BALI
INDIAN OCEAN
SCALE
0 10 20 30 40 50 km
JAVA SEA
SEMARANG CITY
WEST FLOODWAY
GARANG RIVER
GARANG RIVER BASIN
PEKALONGAN
KUDUS
SALATIGA
KLATEN
JOGJAKARTA
SURAKARTA
INDIAN OCEAN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KALIMANTAN
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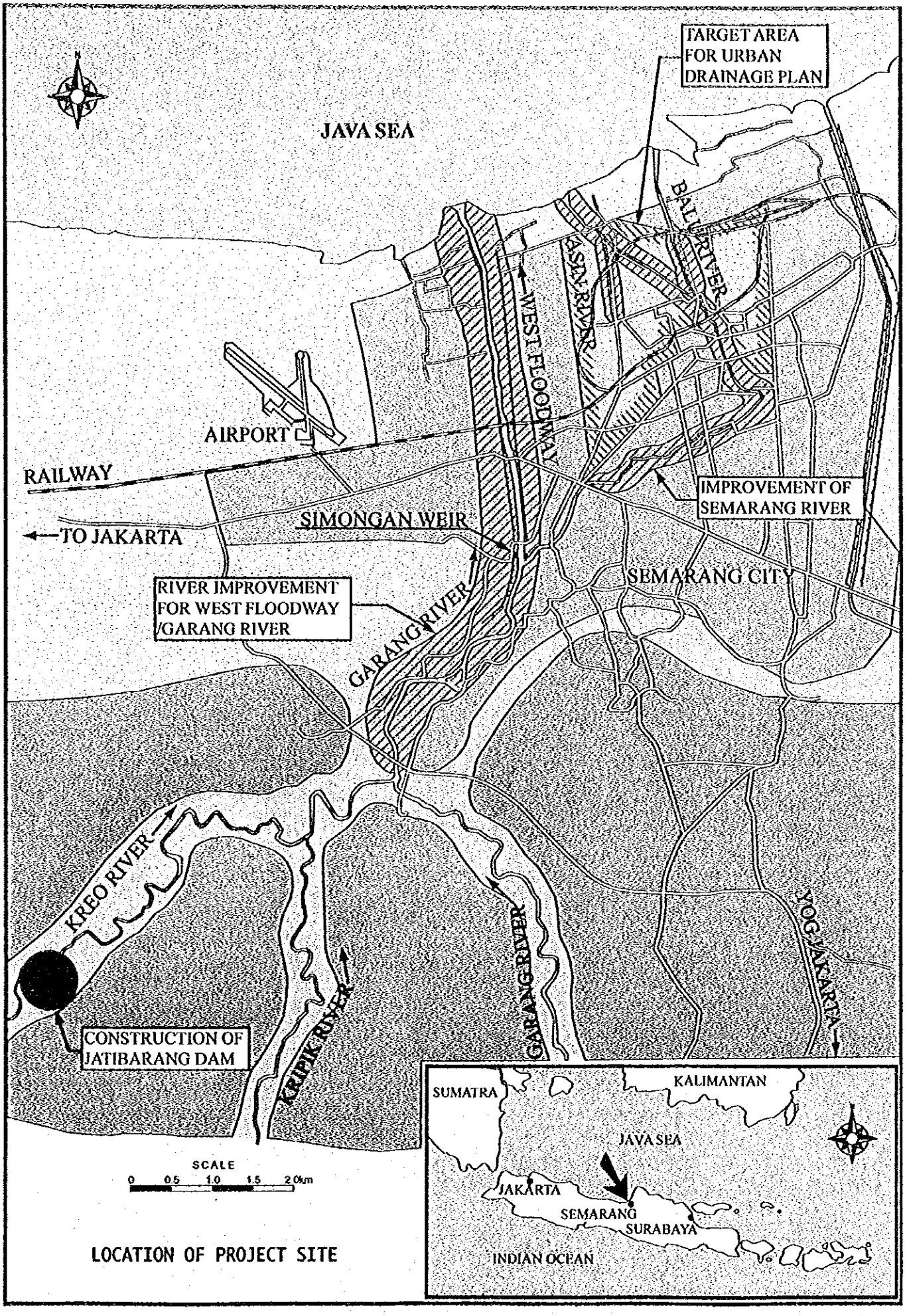
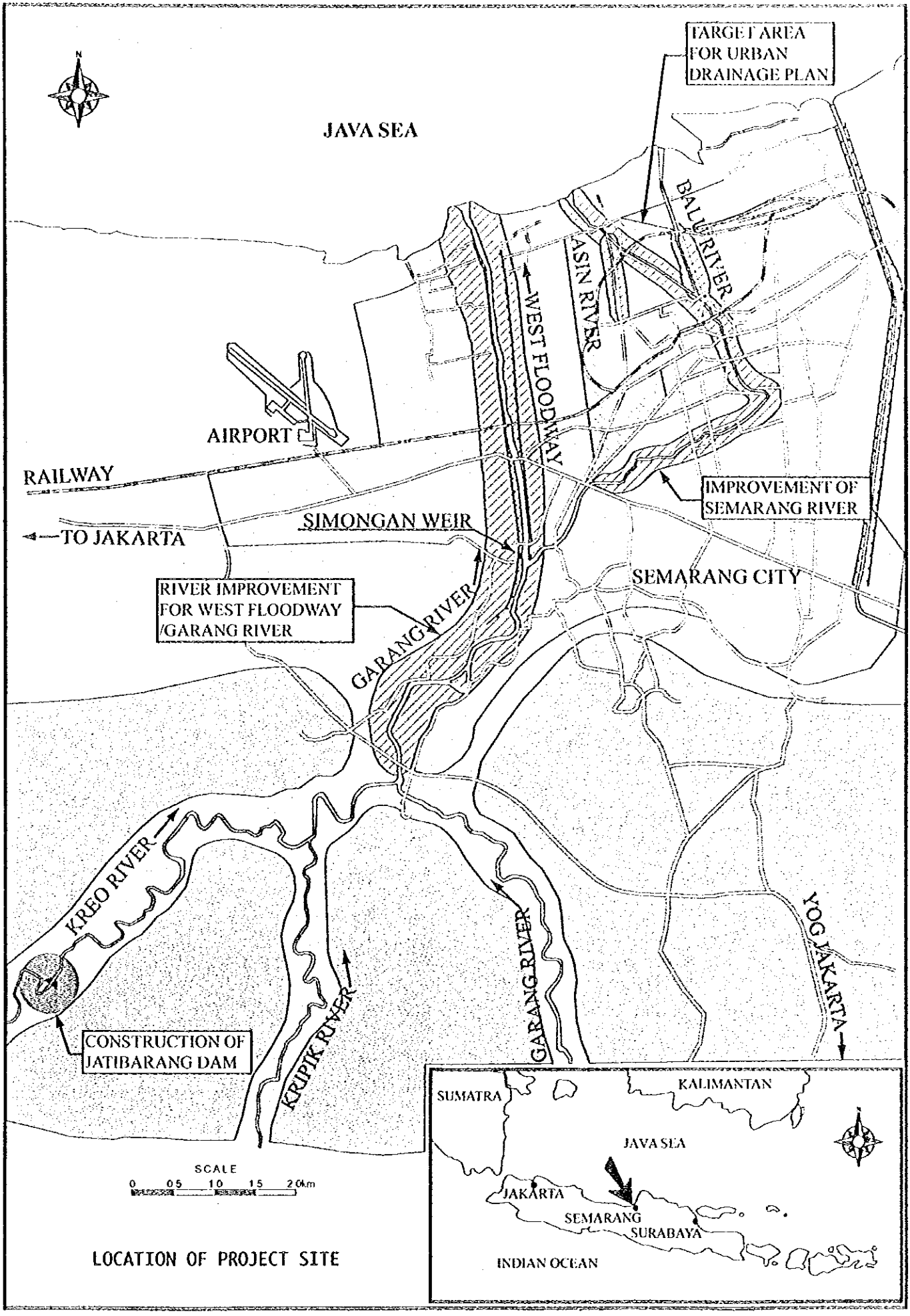


LOCATION OF PROJECT SITE



LOCATION OF PROJECT SITE

VOLUME III WORK QUANTITY CALCULATION

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PACKAGE 1
SEMARANG RIVER DRAINAGE SYSTEM IMPROVEMENT

Package 1: A General

FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG

Component: Urban Drainage System Improvement

Package 1: Semarang River Drainage System Improvement

BILL OF QUANTITIES

Item No.	Description	Unit	Quantity
A	GENERAL		
A.1	Mobilization and Demobilization	L.S.	
A.2	Establishment		
A.2.1	Temporary Construction Road	L.S.	
A.2.2	Contractor's Site Office and Facilities	L.S.	
A.2.3	Engineer's Site Office and Facilities	L.S.	
A.3	Drawings	L.S.	
A.4	Surveying	L.S.	
B	CHANNEL WORKS		
B.1	Preparatory Works		
B.1.1	Clearing of Garbage	L.S.	
B.2	Channel Excavation		
B.2.1	Excavation below Water Level including Hauling and Treatment of Contaminated	m^3	58,409
C	DIKE RAISING		
C.1	Dike Raising		
C.1.1	Structural Excavation	m^3	1,643
C.1.2	Backfill with Selected Soil	m^3	762
C.1.3	Chipping of Existing Dike Surface	m^2	4,988
C.1.4	Sand Bedding	m^3	190
C1.5	Wet Stone Masonry	m^3	1,672
C1.6	Joint Filler, 10 mm thick (Elastic Material)	m^2	72
C1.7	Pointing	m^2	4,997
D	INSPECTION ROAD		
D.1	Pavement		
D.1.1	Sand Bedding	m^3	3,520
D.1.2	Concrete Block Pavement	m^2	58,664
D.1.3	Cement Mortar	m^3	141
D.1.4	Concrete Kerb	m^3	1,408
E	MISCELLANEOUS WORKS		
E.1	Preparatory Works		
E.1.1	Coffering and Dewatering	L.S.	
E.1.2	Demolition of Existing Concrete	L.S.	
E.2	Secondary Channel Outlet Closures		
E.2.1	Structural Excavation	m^3	180
E.2.2	Chipping of Existing Outlet Surface	m^2	108
E.2.3	Concrete, Type C1 including Formwork	m^3	113
	form work	m^2	217
E.2.4	Backfill with Selected Soil	m^3	153

Package 1: B Channel Works

Name of Structure	SEMARANG RIVER	Category Calculation	WORK VOLUME	Page	1/1

SUMMARY OF CHANNEL EXCAVATION

1. Excavation including Hauling and Treatment = 58.409 m^3

EXCAVATION OF SEMARANG RIVER

Cross Section	Distance (m)	EXCAVATION		FILL		STRIPPING		CUT	
		AREA	VOLUME	AREA	VOLUME	LENGTH OF STRIPPING	VOLUME	AREA	VOLUME
		(m^2)	(m^3)	(m^2)	(m^3)	(m)	(m^2)	(m^2)	(m^3)
SMR- 00	0.000	44.389							
SMR- 01	32.190	39.065	1343.200						
SMR- 02	27.090	37.283	1034.140						
SMR- 03	33.510	54.129	1531.610						
SMR- 04	37.620	35.622	1688.219						
SMR- 05	22.420	17.874	599.699						
SMR- 06	25.960	83.353	1313.933						
SMR- 07	27.050	25.658	1474.373	4.667	63.120	9.675			
SMR- 08	29.720	44.247	1038.784	1.832	96.571	8.055		0.0001	0.001
SMR- 09	33.370	60.777	1752.323	1.527	56.037	8.080			0.002
SMR- 10	27.390	43.660	1430.262	1.092	35.860	6.026		0.1430	1.958
SMR- 11	33.400	55.287	1652.408	1.154	37.498	7.925			2.388
SMR- 12	31.490	53.727	1716.419	1.439	40.819	7.894			
SMR- 13	29.450	52.175	1559.406	1.482	43.013	6.663		0.0966	1.422
SMR- 14	29.500	56.787	1607.191	0.065	22.827	2.485		0.2480	5.083
SMR- 15	28.610	61.312	1689.411					3.1694	48.886
SMR- 16	30.140	53.382	1728.446	0.131	1.974	1.981		1.3211	67.672
SMR- 17	32.300	56.994	1768.037	1.971	33.949	7.921			21.336
SMR- 18	32.360	51.875	1736.930	2.687	75.373	7.843			
SMR- 19	31.100	46.453	1528.989	1.318	62.289	3.976		1.6905	26.287
SMR- 20	29.100	35.076	1186.240	1.653	43.250	6.302		1.8248	51.148
SMR- 21	28.330	31.495	942.971	1.348	42.498	5.469			25.848
SMR- 21+23	19.960	53.220	845.450						
SMR- 23	31.840	11.710	1033.680						
SMR- 24	32.290	13.746	410.993						
SMR- 25	32.740	19.576	545.492						
SMR- 26	31.380	19.849	618.575						
SMR- 27	29.820	14.281	508.873						
SMR- 28	29.720	12.920	404.208						
SMR- 29	30.260	14.017	407.560						
SMR- 30	28.930	8.873	331.112						
SUB TOTAL1		**1207.912**	**35438.934**	**22.365**	**655.057**	**90.294**	**0.000**	**8.494**	**252.032**
SMR- N1	27.650	14.268	319.925						
SMR- N2	14.970	62.590	575.280						
SMR- N3	20.410	68.580	1338.590						
SMR- N4	30.440	68.488	2086.169						
SMR- N5	30.490	71.493	2134.003						
SMR- N6	39.010	65.247	2669.154						
SMR- N7	31.370	65.155	2045.356						
SMR- N8	32.780	62.050	2084.905						
SMR- N9	30.330	61.961	1880.628						
SMR- N10	29.430	67.934	1911.401						
SMR- N11	29.050	67.842	1972.147						
SMR- N12	28.960	42.642	1599.812						
SMR- N13	26.520	0.325	569.745						
SUB TOTAL2		**718.575**	**21187.116**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
SMR- 43	27.450	7.551	108.099						
SMR- 44	26.510	14.304	289.696						
SMR- 45	27.440	32.248	638.698						
SUB TOTAL3		**54.104**	**1036.493**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
SMR- 46	29.400	18.518	746.257						
SMR- 47	29.580	17.932	539.089						
SMR- 48	31.250	17.388	551.869						
SMR- 49	30.720	16.934	527.177						
SMR- 50	30.580	3.508	312.553						
SMR- 51	31.550	18.975	351.666						
SMR- 52	29.700	11.254	438.889						
SMR- 53	30.480	11.294	343.625						
SMR- 53+17	20.560	15.851	279.086						
SMR- 54	13.510	12.781	193.434						

Cross Section	Distance (m)	EXCAVATION		FILL		STRIPPING		CUT	
		AREA	VOLUME	AREA	VOLUME	LENGTH OF STRIPPING	VOLUME	AREA	VOLUME
		(m^2)	(m^3)	(m^2)	(m^3)	(m)	(m^3)	(m^2)	(m^3)
SMR- 55	31.370	16.366	457.177						
SMR- 56	30.760	3.616	307.325						
SMR- 57	35.140	9.160	224.464						
SMR- 58	37.220	20.634	554.450						
SMR- 59	29.590	26.065	690.869						
SMR- 60	27.660	19.764	633.775						
SMR- 61	26.170	14.859	453.034						
SMR- 62	24.840	15.149	372.696						
SMR- 63	28.930	20.161	516.758						
SMR- 64	27.030	12.321	438.997						
SMR- 65	25.410	15.535	353.912						
SMR- 66	26.150	19.063	452.371						
SMR- 67	31.430	12.826	501.144						
SMR- 68	32.870	10.708	386.788						
SMR- 69	34.380	9.897	354.212						
SMR- 69+14	12.890	17.486	176.486						
SMR- 70	16.180	7.989	206.092						
SMR- 71	31.130	14.785	354.471						
SMR- 72	28.440	18.274	470.091						
SMR- 73	31.430	16.191	541.609						
SMR- 74	31.850	10.239	420.895						
SMR- 75	32.100	12.282	361.464						
SMR- 76	32.820	18.080	498.247						
SMR- 77	30.760	18.525	562.985						
SMR- 78	28.940	17.062	514.946						
SMR- 79	28.030	19.708	515.344						
SMR- 80	30.210	20.349	605.670						
SMR- 81	29.790	21.518	623.614						
SMR- 82	27.590	20.392	578.155						
SMR- 83	28.870	21.132	599.400						
SMR- 84	29.510	20.886	619.972						
SMR- 85	29.720	9.357	449.409						
SMR- 86	29.590	17.167	392.413						
SMR- 87	30.730	11.062	433.729						
SMR- 88	33.630	5.649	281.000						
SMR- 89	35.230	1.624	128.117						
SMR- 90	31.720	1.013	41.816						
SMR- 90+11	11.180	22.194	129.728						
SMR- 91	14.820	16.756	288.623						
SMR- 92	22.640	15.055	360.109						
SMR- 93	20.830	5.436	213.409						
SMR- 94	26.750	10.472	212.768						
SMR- 95	28.930	16.244	386.447						
SMR- 96	25.270	9.337	323.209						
SMR- 97	27.470	7.384	229.662						
SMR- 98	27.280	9.945	236.375						
SMR- 99	30.560	11.261	324.026						
SMR- 100	28.880	8.621	287.092						
SMR- 101	30.800	9.974	286.369						
SMR- 102	30.820	18.143	433.283						
SMR- 103	33.100	17.287	586.365						
SMR- 104	33.130	14.785	531.272						
SMR- 105	39.510	7.157	433.463						
SMR- 106	33.710	8.789	268.768						
SMR- 106+13	5.280	20.376	76.995						
SMR- 107	27.780	6.139	368.291						
SMR- 108	32.400	7.157	215.389						
SMR- 109	27.130	7.191	194.632						
SMR- 110	28.510	9.540	238.495						
SMR- 111	30.640	8.569	272.426						
SMR- 112	29.760	8.629	255.906						
SMR- 113	30.230	16.786	384.147						
SMR- 114	26.020	9.049	336.114						
SMR- 115+15	13.340	22.432	269.980						
SMR- 116	16.510	17.954	333.393						
SMR- 116+8	9.640	19.217	179.165						
SMR- 117	20.680	9.541	297.359						
SMR- 118	29.190	16.786	384.253						
SMR- 119	28.280	9.049	365.307						

Cross Section	Distance (m)	EXCAVATION		FILL		STRIPPING		CUT	
		AREA	VOLUME	AREA	VOLUME	LENGTH OF STRIPPING	VOLUME	AREA	VOLUME
		(m^2)	(m^3)	(m^2)	(m^3)	(m)	(m^2)	(m^2)	(m^3)
SMR- 120	26.970	22.432	424.524						
SMR- 121	27.900	17.954	563.397						
SMR- 121+3	4.190	19.217	77.873						
SMR- 122	27.150	9.541	390.391						
SMR- 123	29.900	12.221	325.544						
SMR- 124	29.940	9.934	331.658						
SMR- 125	30.050	10.417	305.777						
SMR- 126	29.950	13.962	365.075						
SMR- 126+17	17.570	14.807	252.735						
SMR- 127	15.520	3.815	144.569						
SMR- 128	31.650	6.612	165.007						
SMR- 129	35.800	8.759	275.143						
SMR- 130	31.860	5.650	229.537						
SMR- 131	29.090	12.049	257.424						
SMR- 132	27.430	12.884	341.948						
SMR- 133	28.070	4.175	239.419						
SMR- 134	29.290	8.022	178.622						
SMR- 135	26.360	7.196	200.566						
SMR- 136	29.830	12.269	290.316						
SMR- 137	30.300	13.614	392.118						
SMR- 137+14	14.290	14.746	202.631						
SMR- 138	19.300	11.910	257.237						
SMR- 139	31.960	10.656	360.606						
SMR- 140	32.540	10.558	345.154						
SMR- 141	33.270	10.047	342.769						
SMR- 142	32.920	10.365	335.979						
SMR- 142+23	24.480	12.828	283.878						
SMR- 143	6.690	13.391	87.701						
SMR- 144	28.320	6.010	274.719	0.039	1.076	0.444	12.290		
SMR- 145	27.030	6.663	171.273						
SMR- 146	30.960	10.006	258.033	0.015	0.444	2.061	61.898		
SMR- 147	29.100	6.982	247.170	0.009	0.251	0.393	10.813		
SMR- 148	25.990	8.601	202.492						
SMR- 149	28.170	9.247	251.381						
SMR- 150	22.690	6.844	182.551						
SMR- 151	27.270	8.481	209.000						
SMR- 152	27.550	9.312	245.141						
SMR- 153	29.000	9.023	265.856						
SMR- 154	26.600	11.752	276.307						
SMR- 155	28.050	8.914	289.839						
SMR- 156	31.550	6.463	242.571						
SMR- 156+17	17.820	8.785	135.863						
SMR- 157	11.910	8.282	101.633						
SMR- 158	30.760	8.491	257.963						
SMR- 159	29.920	8.175	249.327						
SMR- 160	30.390	9.553	269.373	0.059	1.865	0.463	14.755		
SMR- 161	33.360	7.477	284.053						
SMR- 162	30.190	7.191	221.421						
SMR- 163	29.250	9.373	242.262						
SMR- 164	29.700	7.384	248.841						
SMR- 165	29.490	6.922	210.936						
SMR- 166	28.000	7.497	201.873						
SMR- 167	30.580	8.913	250.920						
SMR- 168	30.290	9.080	272.515						
SMR- 168+7	7.010	8.994	63.349						
SMR- 169	23.540	8.176	202.087						
SMR- 170	29.980	11.190	290.302						
SMR- 171	29.390	11.149	328.278						
SMR- 172	27.720	9.706	289.046						
SMR- 173	30.840	9.563	297.120						
SMR- 174	33.000	8.599	299.676						
SMR- 175	31.710	8.125	265.155						
SMR- 176	30.660	9.520	270.498						
SMR- 177	27.740	7.757	239.642						
SMR- 178	27.400	6.465	194.849						
SMR- 179	28.310	7.630	199.513						
SMR- 180	24.320	8.307	193.789						
SMR- 181	28.810	6.502	213.322						
SMR- 182	30.800	7.741	219.344						

Cross Section	Distance (m)	EXCAVATION		FILL		STRIPPING		CUT	
		AREA	VOLUME	AREA	VOLUME	LENGTH OF STRIPPING	VOLUME	AREA	VOLUME
		(m^2)	(m^3)	(m^2)	(m^3)	(m)	(m^2)	(m^2)	(m^3)
SMR- 183	31.360	9.588	271.721						
SMR- 184	30.450	8.129	269.743						
SMR- 185	30.000	8.324	246.805						
SMR- 186	30.850	8.007	251.916						
SMR- 187	33.000	7.350	253.394						
SMR- 188	31.030	6.113	208.883						
SMR- 189	29.880	6.407	187.055						
SMR- 190	29.660	5.104	170.706						
SMR- 191	26.320	7.638	167.676						
SMR- 192	29.440	6.463	207.554						
SMR- 193	28.440	7.206	194.371						
SMR- 194	31.120	6.937	220.072						
SMR- 195	29.740	2.777	144.449						
SMR- 195+17	17.180	5.103	67.686						
SMR- 196	13.110	5.393	68.799						
SMR- 197	30.170	5.990	171.717						
SMR- 198	29.240	5.288	164.883						
SMR- 199	30.110	5.915	168.653						
SMR- 200	30.030	5.725	174.717						
SMR- 201	30.180	5.457	168.739	0.026	0.789	0.425	12.814		
SMR- 202	30.080	4.310	146.890	0.050	1.530	0.463	14.066		
SMR- 203	30.720	5.667	153.244	0.023	0.686	0.425	12.785		
SMR- 204	29.390	6.048	172.159						
SMR- 205	29.770	6.393	185.195						
SMR- 206	25.650	5.972	158.580						
SMR- 207	32.070	6.799	204.780						
SMR- 208	30.130	6.061	193.742						
SMR- 209	30.120	5.683	176.868						
SMR- 210	30.150	5.762	172.540						
SMR- 211	22.740	0.574	72.049						
SMR- 212	30.400	5.338	89.874						
SMR- 213	30.050	6.040	170.960						
SMR- 214	29.790	6.654	189.080						
SMR- 215	31.090	7.038	212.841						
SMR- 215+22	22.730	6.446	153.242						
SMR- 216	7.440	7.517	51.942						
SMR- 217	30.640	6.563	215.710	0.026	0.790	0.431	13.040		
SMR- 218	29.940	6.455	194.878	0.033	0.988	0.437	13.220		
SMR- 219	30.550	6.016	190.485	0.006	0.192	0.404	12.352		
SMR- 220	30.540	5.522	176.180	0.030	0.913	0.837	25.541		
SMR- 221	30.520	6.792	187.909	0.054	1.631	0.861	25.976		
SMR- 222	29.840	6.478	197.992	0.054	1.652	0.876	26.673		
SMR- 223	31.050	6.228	197.266						
SMR- 224	29.230	6.635	187.990						
SMR- 225	29.380	6.215	188.763						
SMR- 225+10	10.189	6.628	65.371						
SMR- 226	19.780	5.825	123.159	0.043	1.080	0.769	19.235		
SMR- 227	30.240	5.891	177.138	0.067	2.021	0.865	25.976		
SMR- 228	29.800	6.014	177.375	0.017	0.485	0.433	12.641		
SMR- 229	28.560	5.850	169.408	0.021	0.598	0.415	11.657		
SMR- 230	27.660	4.108	137.714	0.007	0.211	0.407	11.612		
SMR- 231	29.430	6.108	150.329	0.006	0.168	0.030	0.876		
SMR- 232	29.560	6.735	189.822						
SMR- 233	29.270	6.418	192.492	0.035	1.040	2.541	74.798		
SMR- 234	29.610	6.214	187.013	0.016	0.483	2.463	73.210		
SMR- 235	29.840	5.703	177.800	0.076	2.072	0.818	22.164		
SMR- 235+24	24.350	6.084	145.502						
SMR- 236	6.750	5.848	40.270	0.022	0.411	0.882	16.290		
SMR- 237	30.210	5.685	174.207	0.006	0.193	0.402	12.159		
SMR- 238	30.360	5.603	171.349						
SMR- 239	29.810	5.388	163.816						
SMR- 240	29.510	5.417	159.432						
SMR- 241	29.920	4.269	144.915						
SMR- 241+13	13.850	0.731	34.628						
SUB TOTAL4	2136.101		58408.814	0.742	21.569	18.543	536.844	0.000	

Package 1: C Dike Raising

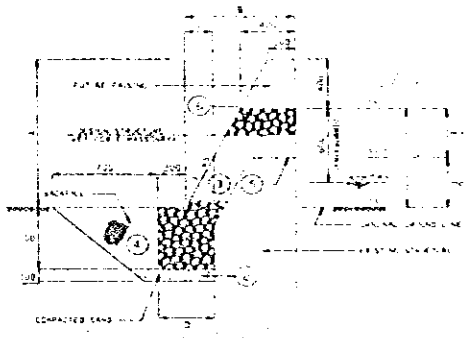
Name of Structure	DIKE RAISING FOR SEMARANG RIVER	Category of calculation	WORK VOLUME	Page	

SUMMARY OF WORK VOLUME

1.	STRUCTURE EXCAVATION	=	1,642.74	m^3
2.	COMPACTED SAND	=	189.20	m^3
3.	WET COBBLE MASONRY	=	1,671.66	m^3
4.	BACK FILL	=	762.30	m^3
5.	CHIPPING	=	4,988.23	m^2
6.	POINTING	=	4,996.97	m^2
7.	JOINT FILLER	=	71.15	m'

NOTES :
SEE PAGE I-8 and PAGE I-5
a. W/el Cobble masonry = 1650.093 + 21.569 = 1,671.66 m^3
b. Chipping = 4451.234 + 536.844 = 4,988.23 m^3

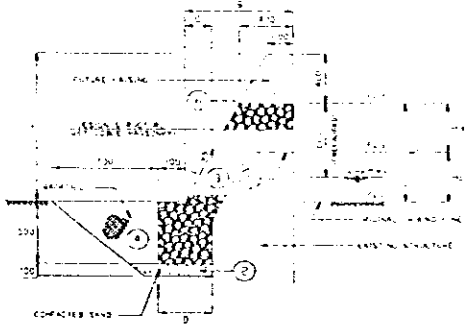
WORK VOLUME OF DYKE RAISING FOR RIGHT SIDE OF SEMARANG RIVER



(1) = STRUCTURE EXCAVATION (m^3)
(2) = COMPACTED SAND (m^3)
(3) = WET COBBLE MASONRY (m^3)
(4) = BACK FILL (m^3)
(5) = CHIPPING (m^2)
(6) = PLASTERING (m^2)

STA	DIST	EL.1	EL.2	EL.3	H.1	H.2	H.3	H	B	C	D	AREA						VOLUME					
(SMR)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
45		+0.28	+1.060	+0.35	0.780	0.070	0.710	1.180	0.790	0.355	0.555	0.573	0.071	0.712	0.225	0.978	1.472						
	29.410																	16.909	2.083	21.257	6.617	29.100	43.836
46		+0.25	+1.063	+0.34	0.813	0.090	0.723	1.213	0.807	0.362	0.562	0.577	0.071	0.733	0.225	1.001	1.509						
	29.602																	17.268	2.138	22.156	6.660	28.959	44.718
47		+0.25	+1.066	+0.30	0.816	0.050	0.766	1.216	0.808	0.383	0.583	0.590	0.073	0.764	0.225	0.956	1.512						
	31.099																	18.403	2.290	23.784	6.997	29.206	46.736
48		+0.27	+1.069	+0.29	0.799	0.020	0.779	1.199	0.800	0.390	0.590	0.593	0.071	0.766	0.225	0.922	1.493						
	30.686																	17.910	2.218	22.548	6.904	28.647	45.017
49		+0.32	+1.072	+0.36	0.752	0.040	0.712	1.152	0.776	0.356	0.556	0.574	0.071	0.701	0.225	0.945	1.441						
	30.579																	17.554	2.161	21.841	6.880	29.743	44.963
50		+0.27	+1.075	+0.36	0.805	0.090	0.715	1.205	0.803	0.358	0.558	0.575	0.071	0.725	0.225	1.001	1.500						
	31.267																	18.357	2.278	23.820	7.035	30.587	47.670
51		+0.23	+1.079	+0.28	0.849	0.050	0.799	1.249	0.825	0.400	0.600	0.600	0.075	0.799	0.225	0.956	1.549						
	29.710																	17.608	2.192	23.273	6.685	29.230	46.077
52		+0.23	+1.082	+0.33	0.852	0.100	0.752	1.252	0.826	0.376	0.576	0.586	0.073	0.768	0.225	1.012	1.553						
	30.465																	18.083	2.252	23.718	6.855	29.292	46.669
53		+0.27	+1.085	+0.28	0.815	0.010	0.805	1.215	0.808	0.403	0.603	0.602	0.075	0.789	0.225	0.911	1.511						
	20.447																	12.305	1.540	16.820	4.601	20.460	32.751
53+17		+0.11	+1.087	+0.28	0.977	0.170	0.807	1.327	0.889	0.404	0.604	0.602	0.075	0.856	0.225	1.090	1.692						
	13.524																	8.287	1.043	11.656	3.043	13.533	22.214
54		+0.20	+1.088	+0.21	0.898	0.010	0.878	1.288	0.844	0.439	0.639	0.623	0.079	0.868	0.225	0.911	1.593						
	31.430																	19.608	2.482	27.535	7.072	29.165	50.642
55		+0.17	+1.091	+0.21	0.921	0.040	0.881	1.321	0.861	0.441	0.641	0.624	0.079	0.881	0.225	0.945	1.630						
	30.735																	19.059	2.408	26.246	6.915	28.864	48.405
56		+0.27	+1.093	+0.24	0.823	-0.030	0.853	1.223	0.812	0.427	0.627	0.616	0.078	0.824	0.225	0.934	1.520						
	35.330																	21.028	2.621	27.224	7.949	33.772	52.956
57		+0.31	+1.095	+0.38	0.785	0.070	0.715	1.185	0.793	0.358	0.558	0.575	0.071	0.718	0.225	0.978	1.478						
	37.008																	22.110	2.760	28.572	8.327	35.997	55.161
58		+0.29	+1.098	+0.23	0.808	-0.060	0.868	1.208	0.804	0.434	0.634	0.620	0.078	0.827	0.225	0.967	1.503						
	29.189																	18.205	2.304	24.920	6.568	27.412	45.383
59		+0.20	+1.100	+0.21	0.900	0.010	0.890	1.300	0.850	0.445	0.645	0.627	0.080	0.881	0.225	0.911	1.606						
	26.460																	15.725	1.959	20.606	5.954	25.145	40.312
60		+0.35	+1.102	+0.43	0.752	0.080	0.672	1.152	0.776	0.336	0.536	0.562	0.069	0.677	0.225	0.939	1.441						
	25.554																	14.704	1.812	17.693	5.750	25.427	35.703
61		+0.43	+1.104	+0.34	0.674	-0.090	0.764	1.074	0.737	0.382	0.582	0.589	0.073	0.708	0.225	1.001	1.354						
	24.943																	14.554	1.802	17.743	5.612	24.122	34.905
62		+0.35	+1.106	+0.38	0.756	0.030	0.726	1.156	0.778	0.363	0.563	0.578	0.071	0.715	0.225	0.934	1.445						
	28.923																	16.547	2.035	19.660	6.508	27.486	39.731
63		+0.48	+1.108	+0.42	0.628	-0.060	0.688	1.028	0.714	0.344	0.543	0.566	0.069	0.645	0.225	0.967	1.302						
	26.951																	14.461	1.736	15.061	6.064	25.461	32.693
64		+0.64	+1.109	+0.62	0.469	-0.020	0.489	0.869	0.635	0.245	0.445	0.507	0.059	0.473	0.225	0.922	1.124						
	25.371																	12.901	1.516	12.447	5.708	24.252	30.115
65		+0.53	+1.111	+0.61	0.581	0.080	0.501	0.981	0.691	0.251	0.451	0.510	0.060	0.508	0.225	0.939	1.250						
	26.534																	13.110	1.522	13.147	5.970	31.742	37.043
66		+0.27	+1.113	+0.72	0.843	0.450	0.393	1.243	0.822	0.197	0.397	0.478	0.055	0.482	0.225	1.403	1.543						
	31.344																	14.895	1.699	14.528	7.052	42.227	46.241
67		+0.39	+1.115	+0.74	0.725	0.350	0.375	1.125	0.763	0.188	0.388	0.473	0.054	0.445	0.225	1.291	1.411						
	32.692																	15.212	1.718	13.748	7.356	42.216	45.2 7
68		+0.44	+1.117	+0.79	0.677	0.350	0.327	1.077	0.739	0.164	0.364	0.458	0.051	0.397	0.225	1.291	1.357						
	34.032																	15.707	1.767	14.419	7.657	47.370	50.040
69		+0.24	+1.120	+0.77	0.880	0.530	0.350	1.280	0.849	0.175	0.375	0.465	0.053	0.451	0.225	1.493	1.581						
	12.863																	5.925	0.666	5.598	2.894	19.199	20.165
69+14		+0.27	+1.121	+0.80	0.851	0.530	0.321	1.251	0.826	0.161	0.361	0.456	0.051	0.419	0.225	1.493	1.551						
	16.137																	7.463	0.840	7.187	3.631	24.446	25.766
70		+0.19	+1.122	+0.76	0.932	0.570	0.362	1.332	0.866	0.181	0.381	0.469	0.053	0.471	0.225	1.537	1.642						
	31.090																	14.485	1.637	14.286	6.995	47.446	50.390
71		+0.23	+1.124	+0.78	0.893	0.550	0.343	1.293	0.847	0.172	0.372	0.463	0.052	0.448	0.225	1.515	1.600						
	28.466																	12.938	1.445	11.914	6.405	43.601	45.086
72		+0.26	+1.126	+0.84	0.866	0.580	0.286	1.266	0.833	0.143	0.343	0.446	0.049	0.389	0.225	1.518	1.568						
	31.301																	13.823	1.521	11.693	7.043	48.293	48.422
73		+0.30	+1.128	+0.87	0.828	0.570	0.258	1.228	0.814	0.129	0.329	0.437	0.048	0.358	0.225	1.532	1.526						
	31.611																	14.121	1.563	12.522	7.112	49.655	50.386
74		+0.18	+1.130	+0.81	0.950	0.630	0.320	1.350	0.875	0.160	0.360	0.456	0.051	0.434	0.225	1.604	1.662						
	31.923																	14.954	1.694	15.031	7.183	49.253	52.578
75		+0.21	+1.133	+0.73	0.923	0.520	0.403	1.323	0.862	0.202	0.402	0.481	0.055	0.507	0.225	1.481	1.632						
	32.574																	15.636	1.792	16.288	7.329	47.526	52.321
76		+0.26	+1.137	+0.74	0.877	0.480	0.397	1.277	0.839	0.199	0.399	0.479	0.055	0.493	0.225	1.437	1.581						
	30.692																	14.672	1.678	15.276	6.906	45.638	49.933
77		+0.18	+1.140	+0.75	0.960	0.570	0.390	1.360	0.880	0.195	0.395	0.477	0.055	0.503	0.225	1.537	1.673						
	28.105																	12.955	1.457	12.429	6.324	42.891	45.033
78		+0.31	+1.143	+0.86	0.833	0.550	0.283	1.233	0.817	0.142	0.342	0.445	0.049	0.382	0.225	1.515	1.531						
	28.215																	12.693	1.410	11.340	6.348	43.217	44.200
79		+0.25	+1.146	+0.83	0.896	0.580	0.316	1.296	0.848	0.158	0.358	0.455	0.051	0.422	0.225	1.548	1.602						
	30.069																	13.779	1.545	12.689	6.766	44.039	46.029
80		+0.38	+1.149	+0.81	0.769	0.430	0.339	1.169	0.785	0.170	0.370	0.462	0.052	0.422	0.225	1.381	1.460						
	29.804																	13.595	1.521	12.056	6.706	41.435	43.224
81		+0.40	+1.152	+0.85	0.752	0.450	0.302	1.152	0.776	0.151	0.351	0.451	0.050	0.387	0.225	1.403	1.441						
	27.795																	12.495	1.388	10.822	6.254	40.243	41.180
82		+0.33	+1.155	+0.86	0.825	0.530	0.295	1.225	0.813	0.148	0.348	0.449	0.050	0.392	0.225	1.493	1.522						
	29.008																	12.888	1.423	10.972	6.527	43.620	44.031
83		+0.34	+1.157	+0.89	0.817	0.550	0.267	1.217	0.809	0.134	0.334	0.440	0.048	0.365	0.225	1.515	1.513						
	28.537																	12.444	1.361	9.919	6.421	42.434	41.961
84		+0.42	+1.160	+0.92	0.740	0.500	0.240	1.140	0.770	0.120	0.320	0.432	0.047	0.330	0.225	1.459	1.427						
	29.696																	13.323	1.478	11.591	6.682	43.659	44.561
85		+0.29	+1.161	+0.81	0.878	0.520	0.351	1.271	0.836	0.176	0.376	0.465	0.053	0.450	0.225	1.481	1.574						
	29.642																	13.575	1.521	12.722	6.669	45.071	46.999
86		+0.27	+1.162	+0.86	0.892	0.590	0.302	1.292	0.846	0.151	0.351	0.451	0.050	0.408	0.225	1.560	1.597						
	30.705																	13.932	1.554	12.566	6.909	45.657	47.174
87		+0.38	+1.163	+0.84	0.783	0.460	0.323	1.183	0.792	0.162	0.362	0.457	0.051	0.410	0.225	1.414	1.475						
	33.344																	15.140	1.690	13.125	7.502	45.481	47.165
88		+0.49	+1.164	+0.86	0.674	0.370	0.304	1.074	0.737	0.152	0.352	0.451	0.050	0.377	0.225	1.314	1.354						
	34.985																	15.633	1.731	12.738	7.872	46.350	47.178
89		+0.50	+1.165	+0.89	0.665	0.390	0.275	1.065	0.733	0.138	0.338	0.443	0.049	0.351	0.225	1.336	1.343						
	30.818																	13.785	1.527	11.172	6.934	40.140	40.921
90		+0.53	+1.167	+0.86	0.637	0.330	0.307	1.037	0.719	0.154	0.354	0.452	0.050	0.374	0.225	1.269	1.312						
	11.148																	5.090	0.570	4.198	2.508	13.274	13.943
90+11		+0.64	+1.167	+0.83	0.527	0.190	0.337	0.927	0.664	0.169	0.369	0.461	0.052	0.379	0.225	1.112	1.189						
	14.457																	7.338	0.862	6.982	3.253	15.517	17.192
91		+0.64	+1.167	+0.52	0.527	-0.120	0.647	0.927	0.664	0.323	0.524	0.554	0.067	0.586	0.225	1.034	1.189						
	23.993																	12.182	1.431	11.679	5.398	26.288	29.0 4
92		+0.60	+1.168	+0.83	0.568	0.230	0.338	0.968	0.684	0.169	0.369	0.461	0.052	0.387	0.225	1.157	1.235						
	22.833																	10.778	1.226	10.288	5.137	30.123	32.808
93		+0.24	+1.169	+0.76	0.929	0.520	0.409	1.329	0.865	0.205	0.405	0.483	0.055	0.514	0.225	1.481	1.639						
	27.405																	13.150	1.507	13.958	6.166	41.516	45.535
94		+0.20	+1.170	+0.78	0.970	0.580	0.390	1.370	0.885	0.195	0.395	0.477	0.055	0.505	0.225	1.548	1.684						
	28.241																	13.399	1.527	14.006	6.354	43.888	47.461
95		+0.21	+1.173	+0.80	0.963	0.590	0.373	1.363	0.882	0.187	0.387	0.472	0.054	0.487	0.225	1.560	1.677						
	25.900																	12.428	1.424	13.489	5.828	40.829	44.627
96		+0.13	+1.176	+0.75	1.046	0.620	0.426	1.446	0.923	0.213	0.413	0.488	0.056	0.554	0.225	1.593	1.769						
	28.133																	13.656	1.573	15.447	6.330	45.450	50.158
97		+0.11	+1.180	+0.77	1.070	0.660	0.410	1.470	0.935	0.205	0.405	0.483	0.056	0.544	0.225	1.638	1.796						
	27.698																	13.640	1.581	16.471	6.232	47.070	52.432
98		-0.06	+1.183	+0.71	1.243	0.770	0.473	1.643	1.022	0.237	0.437	0.502	0.059	0.645	0.225	1.761	1.990						
	30.491																	15.185	1.768	18.635	6.860	50.964	57.498
99		+0.13	+1.187	+0.74	1.057	0.610	0.447	1.457	0.929	0.224	0.424	0.494	0.057	0.527	0.225	1.582	1.782						
	28.841																	13.874	1.591	15.237	6.489	45.949	50.308
100		+0.20	+1.190	+0.83	0.990	0.630	0.360	1.390	0.895	0.189	0.389	0.468	0.053	0.480	0.225	1.604	1.707						
	30.639																	14.399	1.634	14.872	6.894	48.813	52.176
101		+0.21	+1.193	+0.82	0.983	0.610	0.373	1.383	0.892	0.187	0.387	0.472	0.054	0.491	0.225	1.582	1.699						
	30.830																	15.071	1.741	16.201	6.937	44.292	49.848
102		+0.36	+1.196	+0.71	0.836	0.350	0.486	1.236	0.818	0.243	0.443	0.506	0.059	0.560	0.225	1.291	1.535						
Σ	1691.274																	860.953	101.210	939.821	380.537	2171.733	2583.035

WORK VOLUME OF DYKE RAISING FOR LEFT SIDE OF SEMARANG RIVER



(1) = STRUCTURE EXCAVATION (m^3)
(2) = COMPACTED SAND (m^3)
(3) = WET COBBLE MASONRY (m^3)
(4) = BACK FILL (m^3)
(5) = CHIPPING (m^2)
(6) = PLASTERING (m^2)

STA	DIST	EL.1	EL.2	EL.3	H.1	H.2	H.3	H	B	C	D	AREA						VOLUME					
(SMR)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
45	29.410	+0.13	+1.060	+0.63	0.930	0.500	0.430	1.330	0.865	0.215	0.415	0.489	0.057	0.533	0.225	1.459	1.610	14.086	1.612	14.360	6.617	41.430	45.644
46	29.602	+0.29	+1.063	+0.70	0.773	0.410	0.363	1.173	0.787	0.182	0.382	0.469	0.053	0.443	0.225	1.358	1.464	13.894	1.576	13.304	6.660	41.039	44.221
47	31.099	+0.24	+1.066	+0.70	0.826	0.460	0.366	1.226	0.813	0.183	0.383	0.470	0.053	0.456	0.225	1.414	1.523	14.671	1.668	14.118	6.997	42.419	46.041
48	30.686	+0.32	+1.069	+0.69	0.749	0.370	0.379	1.149	0.775	0.190	0.390	0.474	0.054	0.452	0.225	1.314	1.437	14.550	1.658	14.075	6.904	41.169	45.017
49	30.579	+0.27	+1.072	+0.69	0.802	0.420	0.382	1.202	0.801	0.191	0.391	0.475	0.054	0.465	0.225	1.370	1.497	14.756	1.695	15.115	6.880	42.051	46.843
50	31.267	+0.21	+1.075	+0.64	0.865	0.430	0.435	1.265	0.833	0.218	0.418	0.491	0.057	0.524	0.225	1.381	1.567	15.027	1.723	15.444	7.035	44.221	48.893
51	29.710	+0.22	+1.079	+0.71	0.859	0.490	0.369	1.259	0.830	0.185	0.385	0.471	0.053	0.464	0.225	1.448	1.560	13.998	1.590	13.627	6.685	42.019	45.413
52	30.465	+0.28	+1.082	+0.71	0.802	0.430	0.372	1.202	0.801	0.186	0.386	0.472	0.054	0.456	0.225	1.381	1.497	14.107	1.590	13.123	6.855	42.916	45.477
53	20.447	+0.29	+1.085	+0.77	0.795	0.480	0.315	1.195	0.798	0.158	0.358	0.455	0.051	0.405	0.225	1.437	1.489	9.330	1.014	7.912	4.601	25.946	27.150
53+17	13.524	+0.58	+1.087	+0.76	0.507	0.180	0.327	0.907	0.654	0.164	0.364	0.458	0.051	0.369	0.225	1.101	1.167	6.197	0.695	5.225	3.043	16.481	17.376
54	31.430	+0.37	+1.088	+0.76	0.718	0.390	0.328	1.118	0.759	0.164	0.364	0.458	0.051	0.404	0.225	1.336	1.403	14.516	1.634	13.149	7.072	42.519	45.020
55	30.735	+0.32	+1.091	+0.75	0.771	0.420	0.351	1.171	0.786	0.176	0.376	0.465	0.053	0.433	0.225	1.370	1.462	14.218	1.601	13.345	6.915	44.327	46.859
56	35.330	+0.21	+1.093	+0.76	0.883	0.550	0.333	1.283	0.842	0.167	0.367	0.460	0.052	0.436	0.225	1.515	1.587	16.630	1.888	16.448	7.949	51.547	55.524
57	37.008	+0.24	+1.095	+0.69	0.855	0.450	0.405	1.255	0.828	0.203	0.403	0.482	0.055	0.495	0.225	1.403	1.556	17.836	2.047	18.166	8.327	50.685	56.402
58	29.189	+0.30	+1.098	+0.69	0.793	0.390	0.408	1.198	0.799	0.204	0.404	0.482	0.055	0.486	0.225	1.336	1.492	13.783	1.567	13.272	6.568	39.650	43.099
59	26.460	+0.33	+1.100	+0.76	0.770	0.430	0.340	1.170	0.785	0.170	0.370	0.462	0.052	0.423	0.225	1.381	1.461	12.272	1.384	11.311	5.954	36.239	38.537
60	25.554	+0.34	+1.102	+0.75	0.762	0.410	0.352	1.162	0.781	0.176	0.376	0.466	0.053	0.432	0.225	1.358	1.452	11.715	1.313	10.549	5.750	35.712	37.417
61	24.943	+0.32	+1.104	+0.80	0.784	0.480	0.304	1.184	0.792	0.152	0.352	0.451	0.050	0.394	0.225	1.437	1.477	11.187	1.241	9.390	5.612	34.301	35.045
62	28.923	+0.45	+1.106	+0.82	0.656	0.370	0.286	1.056	0.728	0.143	0.343	0.446	0.049	0.359	0.225	1.314	1.333	12.599	1.377	9.178	6.508	35.247	34.719
63	26.951	+0.69	+1.108	+0.89	0.418	0.200	0.218	0.818	0.609	0.109	0.309	0.425	0.046	0.275	0.225	1.124	1.067	11.429	1.231	7.515	6.064	32.392	30.733
64	25.321	+0.56	+1.109	+0.90	0.549	0.310	0.209	0.949	0.675	0.105	0.305	0.423	0.045	0.282	0.225	1.280	1.214	11.036	1.205	8.256	5.708	33.329	32.809
65	26.534	+0.42	+1.111	+0.82	0.691	0.400	0.291	1.091	0.746	0.146	0.346	0.447	0.050	0.369	0.225	1.347	1.373	11.678	1.283	9.442	5.970	38.417	38.377
66	31.344	+0.29	+1.113	+0.87	0.823	0.580	0.243	1.223	0.812	0.122	0.322	0.433	0.047	0.343	0.225	1.548	1.520	13.390	1.448	10.259	7.052	49.937	48.383
67	32.692	+0.25	+1.115	+0.91	0.865	0.660	0.205	1.265	0.833	0.103	0.303	0.422	0.045	0.311	0.225	1.638	1.567	13.789	1.481	9.911	7.356	50.257	47.979
68	34.032	+0.43	+1.117	+0.91	0.687	0.480	0.207	1.087	0.744	0.104	0.304	0.422	0.045	0.295	0.225	1.437	1.368	14.023	1.486	8.912	7.657	48.702	45.094
69	12.863	+0.51	+1.120	+0.98	0.610	0.470	0.140	1.010	0.705	0.070	0.270	0.402	0.042	0.229	0.225	1.425	1.282	5.520	0.598	4.066	2.894	18.048	17.504
69+14	16.137	+0.37	+1.121	+0.80	0.751	0.430	0.321	1.151	0.776	0.161	0.361	0.456	0.051	0.403	0.225	1.381	1.440	7.414	0.832	6.685	3.631	22.281	23.421
70	31.090	+0.35	+1.122	+0.78	0.772	0.430	0.342	1.172	0.786	0.171	0.371	0.463	0.052	0.425	0.225	1.381	1.463	14.300	1.606	13.110	6.995	44.144	46.399
71	28.466	+0.30	+1.124	+0.80	0.824	0.500	0.324	1.224	0.812	0.162	0.362	0.457	0.051	0.418	0.225	1.459	1.522	12.897	1.438	11.164	6.405	39.145	40.478
72	31.301	+0.48	+1.126	+0.83	0.646	0.350	0.296	1.046	0.723	0.148	0.348	0.449	0.050	0.366	0.225	1.291	1.322	13.916	1.537	11.141	7.043	41.294	41.273
73	31.611	+0.46	+1.128	+0.86	0.668	0.400	0.268	1.068	0.734	0.134	0.334	0.440	0.048	0.346	0.225	1.347	1.347	14.026	1.547	12.007	7.112	48.242	48.619
74	31.923	+0.12	+1.130	+0.84	1.010	0.720	0.290	1.410	0.905	0.145	0.345	0.447	0.050	0.414	0.225	1.705	1.729	14.380	1.599	12.666	7.183	47.468	48.652
75	32.574	+0.49	+1.133	+0.82	0.643	0.330	0.313	1.043	0.722	0.157	0.357	0.454	0.051	0.380	0.225	1.269	1.319	15.196	1.718	13.852	7.329	42.063	45.220
76	30.692	+0.37	+1.137	+0.74	0.767	0.370	0.397	1.167	0.784	0.199	0.399	0.479	0.055	0.471	0.225	1.314	1.458	14.212	1.601	12.421	6.906	37.402	39.983
77	28.105	+0.65	+1.140	+0.85	0.490	0.200	0.290	0.890	0.645	0.145	0.345	0.447	0.050	0.339	0.225	1.124	1.148	12.449	1.372	9.399	6.324	33.464	33.723
78	28.215	+0.56	+1.143	+0.88	0.583	0.320	0.263	0.983	0.692	0.132	0.332	0.439	0.048	0.330	0.225	1.258	1.252	12.439	1.368	9.435	6.348	35.015	35.052
79	30.069	+0.58	+1.146	+0.87	0.566	0.290	0.276	0.966	0.683	0.138	0.338	0.443	0.049	0.338	0.225	1.224	1.233	13.283	1.462	9.938	6.766	35.635	35.775
80	29.804	+0.66	+1.149	+0.88	0.489	0.220	0.269	0.889	0.645	0.135	0.335	0.441	0.048	0.323	0.225	1.146	1.147	12.880	1.402	8.928	6.706	34.821	33.894
81	27.795	+0.68	+1.152	+0.94	0.472	0.260	0.212	0.872	0.636	0.106	0.306	0.424	0.046	0.277	0.225	1.191	1.128	11.243	1.179	6.233	6.254	34.493	30.770
82	29.008	+0.72	+1.155	+1.07	0.435	0.350	0.085	0.835	0.618	0.043	0.243	0.386	0.039	0.172	0.225	1.291	1.086	11.583	1.205	6.330	6.527	39.404	34.950
83	29.537	+0.51	+1.157	+0.98	0.647	0.470	0.177	1.047	0.724	0.089	0.289	0.413	0.044	0.264	0.225	1.425	1.323	12.481	1.342	8.821	6.646	42.930	40.954
84	29.696	+0.40	+1.160	+0.92	0.760	0.520	0.240	1.160	0.780	0.120	0.320	0.432	0.047	0.333	0.225	1.481	1.450	13.189	1.456	11.098	6.682	43.659	44.063
85	29.642	+0.34	+1.161	+0.84	0.821	0.500	0.321	1.221	0.811	0.161	0.361	0.456	0.051	0.415	0.225	1.459	1.518	13.486	1.507	12.035	6.669	42.420	44.016
86	30.705	+0.40	+1.162	+0.85	0.762	0.450	0.312	1.162	0.781	0.156	0.356	0.454	0.051	0.397	0.225	1.403	1.452	13.840	1.539	11.878	6.909	42.911	44.083
87	33.344	+0.43	+1.163	+0.87	0.733	0.440	0.293	1.133	0.767	0.147	0.347	0.448	0.050	0.376	0.225	1.392	1.420	14.940	1.656	12.346	7.502	44.735	45.673
88	34.985	+0.52	+1.164	+0.87	0.644	0.350	0.294	1.044	0.722	0.147	0.347	0.448	0.050	0.364	0.225	1.291	1.320	15.476	1.705	12.039	7.872	44.785	45.677
89	30.818	+0.58	+1.165	+0.91	0.585	0.330	0.255	0.985	0.693	0.128	0.328	0.437	0.048	0.324	0.225	1.269	1.254	13.785	1.527	10.549	6.934	35.661	36.432
90	11.148	+0.71	+1.167	+0.84	0.457	0.130	0.327	0.857	0.629	0.164	0.364	0.458	0.051	0.361	0.225	1.045	1.111	5.007	0.556	3.671	2.508	11.155	11.512
90+11	14.457	+0.85	+1.167	+0.90	0.317	0.050	0.267	0.717	0.559	0.134	0.334	0.440	0.048	0.298	0.225	0.956	0.954	6.970	0.800	6.107	3.253	13.900	16.142
91	23.993	+0.56	+1.167	+0.62	0.607	0.060	0.547	1.007	0.704	0.274	0.474	0.524	0.062	0.547	0.225	0.967	1.279	12.722	1.521	14.404	5.398	26.288	34.333
92	22.833	+0.29	+1.168	+0.58	0.878	0.290	0.588	1.278	0.839	0.294	0.494	0.536	0.064	0.654	0.225	1.224	1.582	11.566	1.357	12.991	5.137	30.378	35.999
93	27.405	+0.30	+1.169	+0.78	0.869	0.480	0.389	1.269	0.835	0.195	0.395	0.477	0.054	0.484	0.225	1.437	1.572	13.685	1.595	14.773	6.166	36.001	42.012
94	28.241	+0.37	+1.170	+0.63	0.800	0.260	0.540	1.200	0.800	0.270	0.470	0.522	0.062	0.594	0.225	1.191	1.494	14.712	1.746	16.938	6.354	34.733	43.199
95	25.900	+0.31	+1.173	+0.64	0.863	0.330	0.533	1.263	0.832	0.267	0.467	0.520	0.062	0.605	0.225	1.269	1.565	13.671	1.631	16.735	5.828	34.024	42.456
96	28.133	+0.18	+1.176	+0.59	0.996	0.410	0.586	1.396	0.898	0.293	0.493	0.536	0.064	0.687	0.225	1.358	1.714	14.880	1.777	18.171	6.330	36.486	45.754
97	27.698	+0.34	+1.180	+0.64	0.840	0.300	0.540	1.240	0.820	0.270	0.470	0.522	0.062	0.605	0.225	1.235	1.539	14.138	1.664	15.634	6.232	34.218	41.439
98	30.491	+0.42	+1.183	+0.72	0.763	0.300	0.463	1.163	0.782	0.232	0.432	0.499	0.058	0.524	0.225	1.235	1.453	15.733	1.860	18.215	6.860	39.203	47.782
99	28.841	+0.22	+1.187	+0.61	0.967	0.390	0.577	1.367	0.884	0.289	0.489	0.533	0.064	0.671	0.225	1.336	1.681	15.215	1.815	19.136	6.489	40.145	49.501
100	30.639	+0.16	+1.190	+0.65	1.030	0.490	0.540	1.430	0.915	0.270	0.470	0.522	0.062	0.656	0.225	1.448	1.752	15.226	1.772	17.203	6.894	44.189	50.635
101	30.830	+0.34	+1.193	+0.82	0.853	0.480	0.373	1.253	0.827	0.187	0.387	0.472	0.054	0.467	0.225	1.437	1.554	14.609	1.664	14.696	6.937	44.809	48.641
102		+0.30	+1.196	+0.81	0.896	0.510	0.386	1.296	0.848	0.193	0.393	0.476	0.054	0.487	0.225	1.470	1.602						
Σ	1692.274																	LEFT SIDE	781.784	87.991	710.272	380.762	2178.501	2413.933
																		RIGHT SIDE	860.95164	101.210	939.821	380.537	2172.733	2583.035
																		BOTH SIDE	1642.737	189.101	1650.093	761.298	4451.234	4996.968

Package 1: D Inspection Road

Name of Structure	INSPECTION ROAD FOR SEMARANG RIVER IMPROVEMENT	Category Calculation	WORK VOLUME	Page	9/2

SUMMARY OF INSPECTION ROAD WORK VOLUME

1.	SAND BEDDING	=	3,519.82	m^3
2.	CONCRETE BLOCK	=	58,663.70	m^2
3.	CEMENT MORTAR	=	140.79	m^3
4.	CONCRETE KERB	=	1,407.93	m^3

Name of Structure	INSPECTION ROAD FOR SEMARANG RIVER IMPROVEMENT	Category Calculation	WORK VOLUME	Page	10/2

1. Length of Road
   Sta. SM No.45 to SM No.241+13, L = 5,866.37 m,
   for both side = 2 × 5,866.37 = 11,732.74 m

2. Sand Bedding = 0.06 × 5 × 11,732.74 = 3,519.82 m^3

3. Concrete Block Pavement = 2 × 0.03 × 0.2 × 11,732.74 = 58,663.7 m^2

4. Cement Mortar = 2 × 0.03 × 0.2 × 11,732.74 = 140.79 m^3

5. Concrete Curb = 2 × 0.2 × 0.3 × 11,732.74 = 1,407.93 m^3

Package 1: E Miscellaneous Works

Name of Structure	SECONDARY CHANNEL OUTLET CLOSING ON SEMARANG RIVER	Category of calculation	WORK VOLUME	Page	1/1

SUMMARY OF SECONDARY CHANNEL OUTLET CLOSING ON SEMARANG RIVER, WORK VOLUME

1.	STRUCTURAL EXCAVATION	=	179.71	m^3
2.	CHIPPING OF EXISTING OUTLET SURFACE	=	108.13	m^2
3.	CONCRETE TYPE C1 INCLUDING FORM WORK	=	112.97	m^3
	FORM WORK	=	216.26	m^2
4.	BACKFILL WITH SELECTED SOIL	=	152.93	m^3

TABLE OF
SECONDARY CHANNEL OUTLET CLOSING ON SEMARANG RIVER

NO.	POSITION OF STRUCTURE	TYPE	DIMENSION				WORK VOLUME				
			W (mm)	h (mm)	H (mm)	l (mm)	CHIPING (m^2)	FORM (m^2)	MASS CONCRETE (m^3)	STRUCTURE EXCAVATION (m^3)	EARTH FILL (m^3)
1	SML. 24+5	I	1,500	950	1,300	500	1.70	4.15	1.04	1.11	2.47
2	SML. 31+5	II	–	270	1,490	500	0.64	7.38	1.85	4.74	3.36
3	SML. 54+17	I	1,810	1,230	2,550	900	3.84	12.72	5.72	10.07	7.79
4	SMR. 22+20	III	4,000	1,060	1,060	500	6.12	8.48	2.12		5.51
5	SMR. 42+6	II	–	250	840	500	0.59	2.08	0.52	0.99	0.61
6	SMR. 49+11	I	1,000	1,000	1,730	650	1.95	4.53	1.47	2.55	2.63
7	SMR. 52+29	I									
8	SMR. 54+10	II	–	460	1,180	500	1.08	3.73	0.93	1.77	1.12
9	SML. 56+30	II	–	100	330	500	0.24	0.32	0.08	0.13	0.07
10	SML. 57+31	I	480	240	730	500	0.48	1.18	0.30	0.89	0.66
11	SML. 60+12	I	510	60	550	500	0.32	1.04	0.26	0.91	0.60
12	SML. 61+5	I	750	500	1,310	500	0.88	3.28	0.82	2.67	2.18
13	SML. 62+0	II	–	120	140	500	0.28	0.58	0.14	0.01	0.01
14	SML. 62+26	I	630	590	1,490	500	0.91	3.50	0.88	3.05	2.49
15	SML. 64+15	I	680	500	1,430	500	0.84	3.67	0.92	3.34	2.65
16	SMR. 65+11	II	–	170	630	500	0.40	1.20	0.30	0.55	0.33
17	SMR. 55+11	II	–	370	1,150	500	0.87	3.80	0.95	1.93	1.24
18	SMR. 55+5	I	850	390	1,120	500	0.82	2.97	0.74	2.35	1.87
19	SMR. 57+0	I									
20	SMR. 61+22	II	–	120	870	500	0.28	2.63	0.66	1.43	0.97
21	SMR. 63+13	II	–	160	510	500	0.38	0.75	0.19	0.32	0.18
22	SML. 66+26	I	890	530	1,380	500	0.98	3.90	0.98	3.15	2.62
23	SML. 70+11	I	2,000	1,100	2,280	800	3.36	11.90	4.76	8.66	7.22
24	SML. 72+19	I	970	850	1,860	650	1.74	5.65	1.84	4.52	3.21
25	SML. 73+29	II	–	170	830	500	0.40	2.24	0.56	1.15	0.73
26	SML. 72+28	I	600	1,720	2,840	1,050	4.24	5.92	3.11	4.67	3.22
27	SML. 74+33	I	480	1,340	2,270	850	2.69	3.91	1.66	2.99	2.32
28	SML. 81+17	I	720	1,720	2,650	1,000	4.16	5.55	2.78	3.42	3.01
29	SMR. 81+19	I	510	1,760	2,840	1,050	4.23	5.07	2.66	3.90	2.86
30	SMR. 83+8	I	540	1,710	2,770	1,050	4.16	5.24	2.75	4.04	2.94
31	SML. 83+13	I	2,780	1,230	2,460	850	4.45	16.70	7.10	11.36	9.82
32	SML. 89+27	I	1,600	1,220	2,210	800	3.23	9.03	3.61	5.60	5.20
33	SMR. 91+3	I	2,720	2,000	4,160	1,550	10.42	31.96	24.77	32.23	25.86
34	SML. 98+6	I	730	870	1,370	500	1.24	2.50	0.63	1.14	1.49
35	SML. 106+6	I	2,450	1,440	2,840	1,000	5.33	17.84	8.92	13.23	10.36
36	SML. 107+22	I	1,990	820	1,800	600	2.18	9.08	2.72	6.26	6.43
37	SML. 115+22	II	–	600	1,360	500	1.41	4.70	1.17	2.19	1.39
38	SML. 115+24	I	2,320	1,700	2,660	1,000	5.72	7.00	3.50	6.68	7.13
39	SML. 116+32	II	–	1,000	1,910	700	2.36	8.51	2.98	3.77	2.36
40	SML. 116+32	I	910	620	950	500	1.08	1.95	0.49	0.70	1.04
41	SML. 116+33	II	–	280	610	500	0.66	0.93	0.23	0.35	0.20
42	SMR. 119+14	I	600	500	640	500	0.80	0.81	0.20	0.16	0.41
43	SMR. 120+22	I	1,172	500	610	500	1.09	1.45	0.36	0.22	0.74
44	SMR. 123+2	II	–	600	1,170	500	0.66	3.23	0.81	1.26	0.81
45	SML. 123+11	I	500	650	910	500	0.90	1.05	0.26	0.33	0.56
46	SML. 124+29	I	610	1,100	1,110	500	1.41	1.35	0.34	0.11	0.91
47	SML. 126+1	I	610	730	1,130	500	1.04	1.70	0.43	0.72	0.95
48	SML. 126+2	II	–	600	810	500	0.66	1.24	0.31	0.28	0.21
49	SML. 128+1	II	–	1,000	1,870	700	2.36	8.07	2.82	3.48	2.18
50	SML. 126+29	II	–	130	890	500	0.31	2.73	0.68	1.49	1.00
51	SMR. 130+18	II	–	800	1,530	550	1.88	5.47	1.50	2.28	1.48
52	SML. 129+33	II	–	1,000	2,060	700	2.36	10.29	3.60	5.03	3.16
53	SML. 131+2	II	–	1,000	1,830	650	2.36	7.64	2.48	3.13	2.08
54	SMR. 133+20	II	–	800	1,290	500	1.88	3.53	0.86	1.16	0.82
55	SML. 139+11	II	–	800	1,090	500	1.88	2.26	0.57	0.53	0.46
56	SML. 140+32	II	–	800	1,130	500	1.88	2.49	0.62	0.64	0.51
TOTAL VOLUME							108.13	216.28	112.97	179.71	152.93