Package 1 3.1 Sluiceway

KAMAL DRAINAGE CHANNEL

Item No.	Description	Unit	Total Package 1	Stage 1 Total	Stage 2 Total	Stage 2 main SKM-1L KM 20+16m	SKM-2L KM 24+35m	SKM-3L KM 26+2m	SKM-4L KM 29+19m	SKM-5L KM 31+56m	SKM-6L KM 38+3m	SKM-7L KM 42+7m	SKM-8L KM 46+35m	SKM-1R KM 17-20m	SKM-2R KM 21+6m
3.1	Sluiceway														
/ 01	Coffering and care of water including dewatering	L.S.													
/ 02	Excavation including trench cut	cu.m	2,493		1,594	185	187	167	111	133	76	90	124	103	106
/ 03	Backfilling with selected materials	cu.m	614		453	57	72	16	32	39	20	26	35	27	28
/ 04	Geo-textile, t=1.5 mm	sq.m	23		13	1	1	1	1	1	1	1	1	1	1
/ 05	Gravel bedding	cu.m	157		135	4	5	9	11	11	22	22	10	13	11
/ 06	Cobble/rubble filling	cu.m	41		31				5	5			5	6	5
/ 07	Wet cobble/rubble masonry, type 2	cu.m	334		285	9	11	18	24	24	44	45	22	28	25
/ 08	Gabion mattress, 3.0x1.5x0.5 m, PVC coated wire	cu.m	277		164	14	15	12	12	13	12	11	12	14	13
/ 09	PVC pipe for weep hole, diam. 50mm	lin.m	37		25	2	3	2	2	2	1	1	2	2	2
/ 10	Bitumen coating	sq.m	4		4						2	2			
/ 11	Furnishing steel sheet pile, YSPF, W= 400mm	sq.m	354		247	20	19	12	16	17	26	25	17	25	18
/ 12	Driving of steel sheet pile, for Item No. 3.1/11	sq.m	354		247	20	19	12	16	17	26	25	17	25	18
/ 13	Furnishing RC Piles, 250 mm x 250 mm	lin.m	1,703		1,113	126	96	72	72	72	72	72	72	135	56
/ 14	Driving of RC piles, for Item No. 3.1/13	lin.m	1,703		1,113	126	96	72	72	72	72	72	72	135	56
/ 15	Concrete, type 3, for blockout concrete	cu.m	24		14	1	1	1	1	1	1	1	1	2	1
/ 16	Concrete, type 4, for sluiceway structures and revetment	cu.m	377		273	29	22	14	20	23	19	15	22	33	22
/ 17	Concrete, type 5, for leveling	cu.m	57		42	3	3	1	4	5	3	3	4	4	4
/ 18	Base mortar	cu.m	84		71	2	3	5	6	6	11	11	5	7	6
/ 19	Form, type F1, for Item Nos. 3.1/15 and 3.1/16	sq.m	1,944		1,472	133	108	52	126	127	114	106	118	159	126
/ 20	Form, type F2, for Item Nos. 3.1/15 and 3.1/16	sq.m	474		341	38	25	25	25	29	26	19	29	35	26
/ 21	Reinforcing bars, for Item Nos. 3.1/15 and 3.1/16	kg	44,216		32,157	3,417	2,586	1,563	2,395	2,750	2,223	1,760	2,642	3,901	2,601
/ 22	Joint bars, diam. 25mm, L=1m	nos.	10		10						5	5			
/ 23	PVC waterstop, W=200mm	lin.m	10		10						5	5			
/ 24	Rubber joint filler, t= 10 mm	sq.m	45		22	5	5	3			2	2			
/ 25	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 0.7 m x H = 0.7 m	set	1		1							1			
/ 26	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 0.8 m x H = 0.8 m	set	7		3				1						

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Package 1 3.1 Sluiceway

KAMAL DRAINAGE CHANNEL

Item No.	Description	Unit	Total Package 1	Stage 1 Total	Total	Stage 2 main									
						SKM-1L KM 20+16m	SKM-2L KM 24+35m	SKM-3L KM 26+2m	SKM-4L KM 29+19m	SKM-5L KM 31+56m	SKM-6L KM 38+3m	SKM-7L KM 42+7m	SKM-8L KM 46+35m	SKM-1R KM 17-20m	SKM-2R KM 21+6m
/ 27	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 0.9 m x H = 0.9 m	set	1												
/ 28	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.0 m x H = 1.0 m	set	4		3					1	1		1		
/ 29	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.1 m x H = 1.1 m	set	3		3		1							2	
/ 30	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.2 m x H = 1.2 m	set	2		2	1									1
/ 31	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.3 m x H = 1.3 m	set	1		1										
/ 32	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.5 m x H = 1.3 m	set	1		1			1							
/ 33	Steel flap gate including guide frame, accessories and spare parts, W= 0.4 m x H = 0.4 m	set	4												
/ 34	Timber stoplog, W = 0.4 m x H = 0.4 m	set	1												
/ 35	Timber stoplog, W = 0.7 m x H = 0.7 m	set	1		1							1			
/ 36	Timber stoplog, W = 0.8 m x H = 0.8 m	set	1		1				1						
/ 37	Timber stoplog, W = 0.9 m x H = 0.9 m	set	1												
/ 38	Timber stoplog, W = 1.0 m x H = 1.0 m	set	1		1					1					
/ 39	Timber stoplog, W = 1.1 m x H = 1.1 m	set	1		1		1								
/ 40	Timber stoplog, W = 1.2 m x H = 1.2 m	set	1		1	1									
/ 41	Timber stoplog, W = 1.3 m x H = 1.3 m	set	1		1										
/ 42	Timber stoplog, W = 1.5m x H = 1.3 m	set	1		1			1							
/ 43	Maintenance tool for gate, stoplog and hoist	set	2		2	2									

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Package 1 3.1 Sluiceway

KAMAL DRAINAGE CHANNEL

Item No.	Description	Unit				Stage 3			
						Total	main		
			SKM-3R KM 27+42m	SKM-4R KM 40+32m	SKM-5R KM 45+6m		Total	SKM-6R KM 50+31m	SKM-7R KM 54-26m
3.1	Sluiceway								
/ 01	Coffering and care of water including dewatering	L.S.							
/ 02	Excavation including trench cut	cu.m	100	86	126	899	250	113	137
/ 03	Backfilling with selected materials	cu.m	25	31	45	161	86	38	48
/ 04	Geo-textile, t=1.5 mm	sq.m	1	1	1	10	2	1	1
/ 05	Gravel bedding	cu.m	12	1	4	22	7	3	4
/ 06	Cobble/rubble filling	cu.m	5			10			
/ 07	Wet cobble/rubble masonry, type 2	cu.m	25	2	8	49	15	7	8
/ 08	Gabion mattress, 3.0x1.5x0.5 m, PVC coated wire	cu.m	13	10	13	113	27	13	14
/ 09	PVC pipe for weep hole, diam. 50mm	lin.m	2	2	2	12	4	2	2
/ 10	Bitumen coating	sq.m							
/ 11	Furnishing steel sheet pile, YSPF, W= 400mm	sq.m	18	16	18	107	37	18	19
/ 12	Driving of steel sheet pile, for Item No. 3.1/11	sq.m	18	16	18	107	37	18	19
/ 13	Furnishing RC Piles, 250 mm x 250 mm	lin.m	112	60	96	590	180	96	84
/ 14	Driving of RC piles, for Item No. 3.1/13	lin.m	112	60	96	590	180	96	84
/ 15	Concrete, type 3, for blockout concrete	cu.m	1	1	1	10	2	1	1
/ 16	Concrete, type 4, for sluiceway structures and revetment	cu.m	23	15	16	104	35	16	19
/ 17	Concrete, type 5, for leveling	cu.m	4	2	2	15	4	2	2
/ 18	Base mortar	cu.m	6	1	2	13	4	2	2
/ 19	Form, type F1, for Item Nos. 3.1/15 and 3.1/16	sq.m	129	86	88	472	176	85	91
/ 20	Form, type F2, for Item Nos. 3.1/15 and 3.1/16	sq.m	28	15	21	133	43	20	23
/ 21	Reinforcing bars, for Item Nos. 3.1/15 and 3.1/16	kg	2,687	1,727	1,905	12,059	4,110	1,861	2,249
/ 22	Joint bars, diam. 25mm, L=1m	nos.							
/ 23	PVC waterstop, W=200mm	lin.m							
/ 24	Rubber joint filler, t= 10 mm	sq.m			5	23	10	5	5
/ 25	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 0.7 m x H = 0.7 m	set							
/ 26	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 0.8 m x H = 0.8 m	set		1	1	4	1	1	

Package 1 3.1 Sluiceway

KAMAL DRAINAGE CHANNEL

Item No.	Description	Unit				Stage 3			
						Total	main		
			SKM-3R KM 27+42m	SKM-4R KM 40+32m	SKM-5R KM 45+6m		Total	SKM-6R KM 50+31m	SKM-7R KM 54-26m
/ 27	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 0.9 m x H = 0.9 m	set				1			
/ 28	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.0 m x H = 1.0 m	set				1	1		1
/ 29	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.1 m x H = 1.1 m	set							
/ 30	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.2 m x H = 1.2 m	set							
/ 31	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.3 m x H = 1.3 m	set	1						
/ 32	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.5 m x H = 1.3 m	set							
/ 33	Steel flap gate including guide frame, accessories and spare parts, W= 0.4 m x H = 0.4 m	set				4			
/ 34	Timber stoplog, W = 0.4 m x H = 0.4 m	set				1			
/ 35	Timber stoplog, W = 0.7 m x H = 0.7 m	set							
/ 36	Timber stoplog, W = 0.8 m x H = 0.8 m	set							
/ 37	Timber stoplog, W = 0.9 m x H = 0.9 m	set				1			
/ 38	Timber stoplog, W = 1.0 m x H = 1.0 m	set							
/ 39	Timber stoplog, W = 1.1 m x H = 1.1 m	set							
/ 40	Timber stoplog, W = 1.2 m x H = 1.2 m	set							
/ 41	Timber stoplog, W = 1.3 m x H = 1.3 m	set	1						
/ 42	Timber stoplog, W = 1.5m x H = 1.3 m	set							
/ 43	Maintenance tool for gate, stoplog and hoist	set							

Package 1 3.1 SLUICEWAY

KAMAL DRAINAGE CHANNEL (BRANCH)

Item No.	Description	Unit	Stage 3								
				branch							
			Total	SKE-1L KE 01+5m	SKE-2L KE 12-32m	SKE-3L KE 13+0m	SKE-4L KE 25-5m	SKE-5L KE 31-43m	SKE-1R KE 21+5m	SKE-2R KE 25-5m	SKE-3R KE 31+0m
3.1	Sluiceway										
/ 01	Coffering and care of water including dewatering	L.S.									
/ 02	Excavation including trench cut	cu.m	649	99	109	103	47	70	90	62	69
/ 03	Backfilling with selected materials	cu.m	75	7	10	9	14	7	6	15	7
/ 04	Geo-textile, t=1.5 mm	sq.m	8	1	1	1	1	1	1	1	1
/ 05	Gravel bedding	cu.m	15	3	2	2	1	2	2	1	2
/ 06	Cobble/rubble filling	cu.m	10		5	5					
/ 07	Wet cobble/rubble masonry, type 2	cu.m	34	5	5	5	1	6	5	1	6
/ 08	Gabion mattress, 3.0x1.5x0.5 m, PVC coated wire	cu.m	86	12	11	11	9	11	12	9	11
/ 09	PVC pipe for weep hole, diam. 50mm	lin.m	8	1	1	1	1	1	1	1	1
/ 10	Bitumen coating	sq.m									
/ 11	Furnishing steel sheet pile, YSPF, W= 400mm	sq.m	70	10	9	9	16		10	16	
/ 12	Driving of steel sheet pile, for Item No. 3.1/11	sq.m	70	10	9	9	16		10	16	
/ 13	Furnishing RC Piles, 250 mm x 250 mm	lin.m	410	48	42	42	70	20	56	112	20
/ 14	Driving of RC piles, for Item No. 3.1/13	lin.m	410	48	42	42	70	20	56	112	20
/ 15	Concrete, type 3, for blockout concrete	cu.m	8	1	1	1	1	1	1	1	1
/ 16	Concrete, type 4, for sluiceway structures and revetment	cu.m	69	9	9	8	12	3	8	17	3
/ 17	Concrete, type 5, for leveling	cu.m	11	1	1	1	2	1	1	3	1
/ 18	Base mortar	cu.m	9	2	1	1	1	1	1	1	1
/ 19	Form, type F1, for Item Nos. 3.1/15 and 3.1/16	sq.m	296	37	33	33	64	7	33	82	7
/ 20	Form, type F2, for Item Nos. 3.1/15 and 3.1/16	sq.m	90	15	8	8	13	7	12	20	7
/ 21	Reinforcing bars, for Item Nos. 3.1/15 and 3.1/16	kg	7,949	1,028	974	948	1,381	357	915	1,989	357
/ 22	Joint bars, diam. 25mm, L=1m	nos.									
/ 23	PVC waterstop, W=200mm	lin.m									
/ 24	Rubber joint filler, t= 10 mm	sq.m	13	3	1	1	3		2	3	
/ 25	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 0.7 m x H = 0.7 m	set									
/ 26	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 0.8 m x H = 0.8 m	set	3	1			1		1		

Package 1 3.1 SLUICEWAY

KAMAL DRAINAGE CHANNEL (BRANCH)

Item No.	Description	Unit	Stage 3 branch								
			Total	SKE-1L KE 01+5m	SKE-2L KE 12-32m	SKE-3L KE 13+0m	SKE-4L KE 25+5m	SKE-5L KE 31-43m	SKE-1R KE 21+5m	SKE-2R KE 25-5m	SKE-3R KE 31+0m
/ 27	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 0.9 m x H = 0.9 m	set	1							1	
/ 28	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.0 m x H = 1.0 m	set									
/ 29	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.1 m x H = 1.1 m	set									
/ 30	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.2 m x H = 1.2 m	set									
/ 31	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.3 m x H = 1.3 m	set									
/ 32	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.5 m x H = 1.3 m	set									
/ 33	Steel flap gate including guide frame, accessories and spare parts, W= 0.4 m x H = 0.4 m	set	4		1	1		1			1
/ 34	Timber stoplog, W = 0.4 m x H = 0.4 m	set	1		1						
/ 35	Timber stoplog, W = 0.7 m x H = 0.7 m	set									
/ 36	Timber stoplog, W = 0.8 m x H = 0.8 m	set									
/ 37	Timber stoplog, W = 0.9 m x H = 0.9 m	set	1							1	
/ 38	Timber stoplog, W = 1.0 m x H = 1.0 m	set									
/ 39	Timber stoplog, W = 1.1 m x H = 1.1 m	set									
/ 40	Timber stoplog, W = 1.2 m x H = 1.2 m	set									
/ 41	Timber stoplog, W = 1.3 m x H = 1.3 m	set									
/ 42	Timber stoplog, W = 1.5m x H = 1.3 m	set									
/ 43	Maintenance tool for gate, stoplog and hoist	set									

SW-45

Package 2 3.1 Sluiceway

TANJUNGAN DRAINAGE CHANNEL

Item No.	Description	Unit	Total	STM-1L TM 25-13m	STM-2L TM 30-10m	STM-3L TM 30+16m	STM-4L TM 33+13m	STM-1R TM 25-13m	STM-2R TM 30+3m	STM-3R TM 35+0m
3.1	Sluiceway									
/ 01	Coffering and care of water including dewatering	L.S.								
/ 02	Excavation including trench cut	cu.m	538	137	21	81	63	119	36	81
/ 03	Backfilling with selected materials	cu.m	67	13	7	17	12	10	4	4
/ 04	Geo-textile, t=1.5 mm	sq.m	5	1	1	1	1	1		
/ 05	Gravel bedding	cu.m	20	4	3	3	3	3	2	2
/ 06	Wet cobble/rubble masonry, type 2	cu.m	47	8	7	9	7	7	4	5
/ 07	Gabion mattress, 3.0x1.5x0.5 m, PVC coated wire	cu.m	71	13	8	8	8	13	10	11
/ 08	PVC pipe for weep hole, diam. 50mm	lin.m	7	2	1	2	1	1		
/ 09	Furnishing steel sheet pile, YSPF, W= 400mm	sq.m	20	10				10		
/ 10	Driving of steel sheet pile, for Item No. 3.1/09	sq.m	20	10				10		
/ 11	Furnishing RC Piles, 250 mm x 250 mm	lin.m	512	72	72	48	48	72	56	144
/ 12	Driving of RC piles, for Item No. 3.1/11	lin.m	512	72	72	48	48	72	56	144
/ 13	Concrete, type 3, for blockout concrete	cu.m	8	1	2	1	1	1	1	1
/ 14	Concrete, type 4, for sluiceway structures and revetment	cu.m	62	10	10	6	6	10	7	13
/ 15	Concrete, type 5, for leveling	cu.m	11	1	1	1	1	1	3	3
/ 16	Base mortar	cu.m	12	2	2	2	2	2	1	1
/ 17	Form, type F1, for Item Nos. 3.1/13 and 3.1/14	sq.m	214	41	22	19	18	39	31	44
/ 18	Form, type F2, for Item Nos. 3.1/13 and 3.1/14	sq.m	113	17	23	14	13	16	11	19
/ 19	Reinforcing bars, for Item Nos. 3.1/13 and 3.1/14	kg	6,934	1,125	1,118	708	699	1,093	741	1,450
/ 20	Rubber joint filler, t= 10 mm	sq.m	4	2				2		
/ 21	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 0.8 m x H = 0.8 m	set	4	1		1		1		1
/ 22	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.0 m x H = 1.0 m	set	3		2		1			
/ 23	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.1 m x H = 1.1 m	set								
/ 24	Steel flap gate including guide frame, accessories and spare parts, W= 0.4 m x H = 0.4 m	set	1						1	

Package 2 3.1 Sluiceway

PIK JUNCTION DRAINAGE CHANNEL

Item No.	Description	Unit	Total	SNM-1R NM 34+0m
3.1	Sluiceway			
/ 01	Coffering and care of water including dewatering	L.S.		
/ 02	Excavation including trench cut	cu.m	11	11
/ 03	Backfilling with selected materials	cu.m	11	11
/ 04	Geo-textile, t=1.5 mm	sq.m	1	1
/ 05	Gravel bedding	cu.m	4	4
/ 06	Wet cobble/rubble masonry, type 2	cu.m	10	10
/ 07	Gabion mattress, 3.0x1.5x0.5 m, PVC coated wire	cu.m	7	7
/ 08	PVC pipe for weep hole, diam. 50mm	lin.m	2	2
/ 09	Furnishing steel sheet pile, YSPF, W= 400mm	sq.m		
/ 10	Driving of steel sheet pile, for Item No. 3.1/09	sq.m		
/ 11	Furnishing RC Piles, 250 mm x 250 mm	lin.m	48	48
/ 12	Driving of RC piles, for Item No. 3.1/11	lin.m	48	48
/ 13	Concrete, type 3, for blockout concrete	cu.m	1	1
/ 14	Concrete, type 4, for sluiceway structures and revetment	cu.m	9	9
/ 15	Concrete, type 5, for leveling	cu.m	1	1
/ 16	Base mortar	cu.m	2	2
/ 17	Form, type F1, for Item Nos. 3.1/13 and 3.1/14	sq.m	14	14
/ 18	Form, type F2, for Item Nos. 3.1/13 and 3.1/14	sq.m	15	15
/ 19	Reinforcing bars, for Item Nos. 3.1/13 and 3.1/14	kg	980	980
/ 20	Rubber joint filler, t= 10 mm	sq.m		
/ 21	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 0.8 m x H = 0.8 m	set		
/ 22	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.0 m x H = 1.0 m	set		
/ 23	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.1 m x H = 1.1 m	set	1	1
/ 24	Steel flap gate including guide frame, accessories and spare parts, W= 0.4 m x H = 0.4 m	set		

SW-47

Package 3 3.1 SLUICEWAY

GEDE/BOR DRAINAGE CHANNEL

Item No.	Description	Unit	Total	SGM-1L GM 12+0m	SGM-2L GM 14+5m	SGM-3L GM 15+24m	SGM-1R GM 04+44m	SGM-2R GM 12+0m
3.1	Sluiceway							
/ 01	Coffering and care of water including dewatering	L.S.						
/ 02	Demolishing, hauling and disposing existing concrete structures	cu.m	20		20			
/ 03	Demolishing, hauling and disposing existing asphalt/masonry structures	cu.m	38		38			
/ 04	Excavation including trench cut	cu.m	590	76	153	90	141	130
/ 05	Backfilling with selected materials	cu.m	121	21	49	25	14	12
/ 06	Geo-textile, t=1.5 mm	sq.m	4	1		1	1	1
/ 07	Sod facing	sq.m						
/ 08	Gravel bedding	cu.m	9	1		2	3	3
/ 09	Cobble/rubble filling	cu.m						
/ 10	Wet cobble/rubble masonry, type 2	cu.m	21	2		5	7	7
/ 11	Gabion mattress, 3.0x1.5x0.5 m, PVC coated wire	cu.m	58	10	10	12	13	13
/ 12	Gabion mattress, 3.0x1.5x0.5 m, galvanized wire	cu.m	36	10			13	13
/ 13	PVC pipe for weep hole, diam. 50mm	lin.m	6	1		1	2	2
/ 14	Bitumen coating	sq.m						
/ 15	Furnishing steel sheet pile, YSPF, W= 400mm	sq.m	100	16	43	21	10	10
/ 16	Driving of steel sheet pile, for Item No. 3.1/15	sq.m	100	16	43	21	10	10
/ 17	Furnishing RC Piles, 250 mm x 250 mm	lin.m	474	96	162	120	48	48
/ 18	Driving of RC piles, for Item No. 3.1/17	lin.m	474	96	162	120	48	48
/ 19	Furnishing RC Piles, 300 mm x 300 mm	lin.m						
/ 20	Driving of RC piles, for Item No. 3.1/19	lin.m						
/ 21	Concrete, type 3, for blockout concrete	cu.m	7	1	3	1	1	1
/ 22	Concrete, type 4, for sluiceway structures and revetment	cu.m	98	17	44	17	10	10
/ 23	Concrete, type 5, for leveling	cu.m	11	3	3	3	1	1
/ 24	Base mortar	cu.m	10	1	4	1	2	2
/ 25	Form, type F1, for Item Nos. 3.1/21 and 3.1/22	sq.m	364	97	101	85	39	42
/ 26	Form, type F2, for Item Nos. 3.1/21 and 3.1/22	sq.m	175	20	98	23	16	18
/ 27	Reinforcing bars, for Item Nos. 3.1/21 and 3.1/22	kg	11,546	1,945	5,279	2,019	1,132	1,171
/ 28	Joint bars, diam. 25mm, L=1m	nos.						
/ 29	PVC waterstop, W=200mm	lin.m						
/ 30	Rubber joint filler, t= 10 mm	sq.m	19	4	6	4	2	3
/ 31	Sub-base course	cu.m						
/ 32	Base-course	cu.m						
/ 33	Asphalt pavement	sq.m						
/ 34	Furnishing and installing traps	kg						
/ 35	Steel galvanized pipe, diam. 1 1/4"	kg						
/ 36	Steel galvanized pipe, diam. 3/4"	kg						
/ 37	Embedded metal for stoplog groove	kg						
/ 38	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 0.8 m x H = 0.8 m	set	4	1		1	1	1
/ 39	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 0.9 m x H = 0.9 m	set						
/ 40	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.0 m x H = 1.0 m	set	2		2			
/ 41	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.1 m x H = 1.1 m	set						
/ 42	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.2 m x H = 1.2 m	set						
/ 43	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.3 m x H = 1.3 m	set						
/ 44	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 2.3 m x H = 2.3 m	set						
/ 45	Timber stoplog, W = 2.3 m x H = 2.3 m	set						
/ 46	Steel stand for portable hanger	set						
/ 47	Portable hanger, handling tools and slings for 2.3mx2.3m stoplog	set						

SW-YE

Package 3 3.1 SLUICEWAY

SALURAN CENGKERENG DRAINAGE CHANNEL

Item No.	Description	Unit	Total	Outlet sluiceway	SCM-1L CM 05+5m	SCM-2L CM 16+12m	SCM-3L CM 20+10m	SCM-4L CM 27+21m	SCM-5L CM 30+0m	SCM-6L CM 37+30m	SCM-7L CM 41+0m	SCM-8L CM 47+34m	SCM-1R CM 15+10m	SCM-2R CM 16+4m	SCM-3R CM 26+1m	SCM-4R CM 30+0m	SCM-5R CM 37+0m	SCM-6R CM 43+30m	SCM-7R CM 47+53m
3.1	Sluiceway																		
/ 01	Coffering and care of water including dewatering	L.S.																	
/ 02	Demolishing, hauling and disposing existing concrete structures	cu.m	45	45															
/ 03	Demolishing, hauling and disposing existing asphalt/masonry structures	cu.m	74	74															
/ 04	Excavation including trench cut	cu.m	3,035	1,430	24	133	112	86	146	102	154	90	185	95	70	120	91	93	104
/ 05	Backfilling with selected materials	cu.m	710	308	24	36	30	9	49	24	47	31	20	10	7	33	23	24	35
/ 06	Geo-textile, t=1.5 mm	sq.m	15		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
/ 07	Sod facing	sq.m	62	62															
/ 08	Gravel bedding	cu.m	172	2	6	15	12	20	12	12	12	1	4	22	18	12	12	11	1
/ 09	Cobble/rubble filling	cu.m	41			6	5		5	5	5					5	5	5	
/ 10	Wet cobble/rubble masonry, type 2	cu.m	368	4	15	32	27	42	25	26	25	2	9	45	37	26	26	25	2
/ 11	Gabion mattress, 3.0x1.5x0.5 m, PVC coated wire	cu.m	241	73	8	14	13	8	13	12	13	11	14	8	7	13	12	12	10
/ 12	Gabion mattress, 3.0x1.5x0.5 m, galvanized wire	cu.m																	
/ 13	PVC pipe for weep hole, diam. 50mm	lin.m	33		3	3	2	2	2	2	3	2	2	2	2	2	2	2	2
/ 14	Bitumen coating	sq.m	110	101				3						3	3				
/ 15	Furnishing steel sheet pile, YSPF, W= 400mm	sq.m	291	66		26	20	11	17	17	17	16	11	12	11	17	17	17	16
/ 16	Driving of steel sheet pile, for Item No. 3.1/15	sq.m	291	66		26	20	11	17	17	17	16	11	12	11	17	17	17	16
/ 17	Furnishing RC Piles, 250 mm x 250 mm	lin.m	929		24	105	144	28	48	72	72	60	56	28	28	72	48	48	96
/ 18	Driving of RC piles, for Item No. 3.1/17	lin.m	929		24	105	144	28	48	72	72	60	56	28	28	72	48	48	96
/ 19	Furnishing RC Piles, 300 mm x 300 mm	lin.m	560	560															
/ 20	Driving of RC piles, for Item No. 3.1/19	lin.m	560	560															
/ 21	Concrete, type 3, for blockout concrete	cu.m	24	8	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1
/ 22	Concrete, type 4, for sluiceway structures and revetment	cu.m	836	552	12	33	25	10	21	25	24	16	12	11	10	24	22	21	18
/ 23	Concrete, type 5, for leveling	cu.m	95	48	1	5	5	1	4	5	5	2	1	1	1	5	4	4	3
/ 24	Base mortar	cu.m	88	1	3	8	6	10	6	6	6	1	2	11	9	6	6	6	1
/ 25	Form, type F1, for Item Nos. 3.1/21 and 3.1/22	sq.m	2,230	650	20	188	144	64	128	139	134	89	46	67	59	139	131	127	105
/ 26	Form, type F2, for Item Nos. 3.1/21 and 3.1/22	sq.m	726	366	21	45	29	16	22	31	31	16	20	17	16	29	23	24	20
/ 27	Reinforcing bars, for Item Nos. 3.1/21 and 3.1/22	kg	100,444	66,122	1,338	4,957	2,940	1,175	2,431	2,946	2,882	1,915	1,422	1,233	1,110	2,875	2,525	2,522	2,051
/ 28	Joint bars, diam. 25mm, L=1m	nos.	68	50				6						6	6				
/ 29	PVC waterstop, W=200mm	lin.m	65	50				5						5	5				
/ 30	Rubber joint filler, t= 10 mm	sq.m	14					1				4	2	2	1				4
/ 31	Sub-base course	cu.m	22	22															
/ 32	Base-course	cu.m	16	16															
/ 33	Asphalt pavement	sq.m	106	106															
/ 34	Furnishing and installing traps	kg	125	125															
/ 35	Steel galvanized pipe, diam. 1 1/4"	kg	28	28															

Sw-49

Package 3 3.1 SLUICEWAY

SALURAN CENGKERENG DRAINAGE CHANNEL

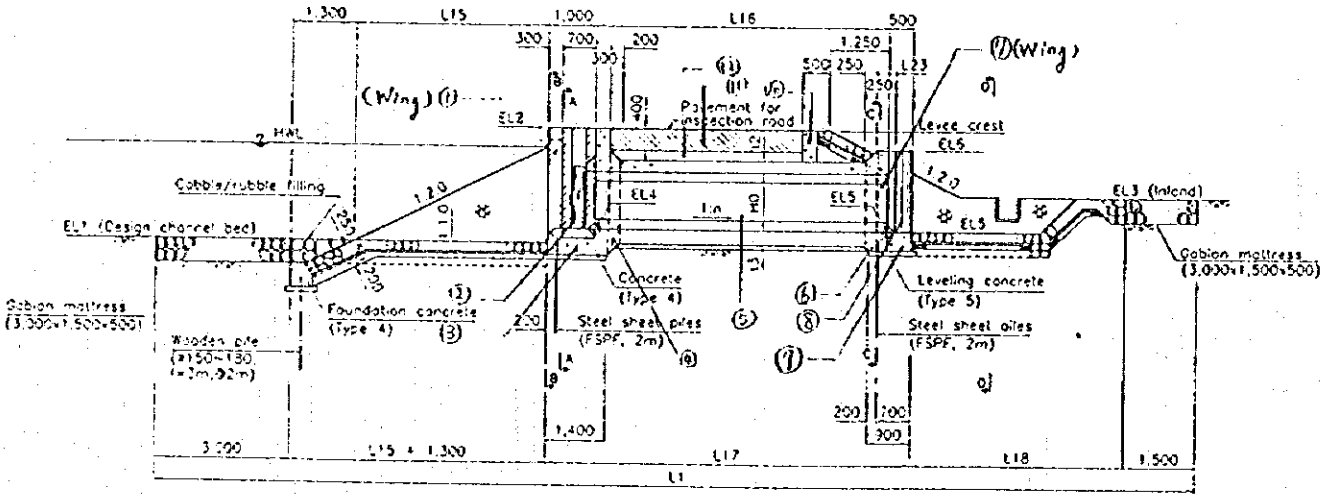
Item No.	Description	Unit	Total	Outlet sluiceway	SCM-1L CM 05-5m	SCM-2L CM 16+12m	SCM-3L CM 20+10m	SCM-4L CM 27-21m	SCM-5L CM 30+0m	SCM-6L CM 37+30m	SCM-7L CM 41+0m	SCM-8L CM 47+34m	SCM-1R CM 15-10m	SCM-2R CM 16-4m	SCM-3R CM 26+1m	SCM-4R CM 30+0m	SCM-5R CM 37+0m	SCM-6R CM 43-30m	SCM-7R CM 47+53m
/ 36	Steel galvanized pipe, diam. 3/4"	kg	61	61															
/ 37	Embedded metal for stoplog groove	kg	260	260															
/ 38	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 0.8 m x H = 0.8 m	set	1																1
/ 39	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 0.9 m x H = 0.9 m	set	1									1							
/ 40	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.0 m x H = 1.0 m	set	5				1		1						1	1	1		
/ 41	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.1 m x H = 1.1 m	set	4					1		1	1							1	
/ 42	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.2 m x H = 1.2 m	set	4			2							1	1					
/ 43	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.3 m x H = 1.3 m	set	1		1														
/ 44	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 2.3 m x H = 2.3 m	set	5	5															
/ 45	Timber stoplog, W = 2.3 m x H = 2.3 m	set	2	2															
/ 46	Steel stand for portable hanger	set	10	10															
/ 47	Portable hanger, handling tools and slings for 2.3mx2.3m stoplog	set	2	2															

Package 3 3.1 SLUICEWAY
MERUYA AREA

Item No.	Description	Unit	Total
3.1	Sluiceway		
/ 01	Coffering and care of water including dewatering	L.S.	
/ 02	Demolishing, hauling and disposing existing concrete structures	cu.m	
/ 03	Demolishing, hauling and disposing existing asphalt/masonry	cu.m	
/ 04	Excavation including trench cut	cu.m	
/ 05	Backfilling with selected materials	cu.m	
/ 06	Geo-textile, t=1.5 mm	sq.m	
/ 07	Sod facing	sq.m	
/ 08	Gravel bedding	cu.m	
/ 09	Cobble/rubble filling	cu.m	
/ 10	Wet cobble/rubble masonry, type 2	cu.m	
/ 11	Gabion mattress, 3.0x1.5x0.5 m, PVC coated wire	cu.m	
/ 12	Gabion mattress, 3.0x1.5x0.5 m, galvanized wire	cu.m	
/ 13	PVC pipe for weep hole, diam. 50mm	lin.m	
/ 14	Bitumen coating	sq.m	
/ 15	Furnishing steel sheet pile, YSPF, W= 400mm	sq.m	
/ 16	Driving of steel sheet pile, for Item No. 3.1/15	sq.m	
/ 17	Furnishing RC Piles, 250 mm x 250 mm	lin.m	
/ 18	Driving of RC piles, for Item No. 3.1/17	lin.m	
/ 19	Furnishing RC Piles, 300 mm x 300 mm	lin.m	
/ 20	Driving of RC piles, for Item No. 3.1/19	lin.m	
/ 21	Concrete, type 3, for blockout concrete	cu.m	
/ 22	Concrete, type 4, for sluiceway structures and revetment	cu.m	
/ 23	Concrete, type 5, for leveling	cu.m	
/ 24	Base mortar	cu.m	
/ 25	Form, type F1, for Item Nos. 3.1/21 and 3.1/22	sq.m	
/ 26	Form, type F2, for Item Nos. 3.1/21 and 3.1/22	sq.m	
/ 27	Reinforcing bars, for Item Nos. 3.1/21 and 3.1/22	kg	
/ 28	Joint bars, diam. 25mm, L=1m	nos.	
/ 29	PVC waterstop, W=200mm	lin.m	
/ 30	Rubber joint filler, t= 10 mm	sq.m	
/ 31	Sub-base course	cu.m	
/ 32	Base-course	cu.m	
/ 33	Asphalt pavement	sq.m	
/ 34	Furnishing and installing traps	kg	
/ 35	Steel galvanized pipe, diam. 1 1/4"	kg	
/ 36	Steel galvanized pipe, diam. 3/4"	kg	
/ 37	Embedded metal for stoplog groove	kg	
/ 38	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 0.8 m x H = 0.8 m	set	
/ 39	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 0.9 m x H = 0.9 m	set	
/ 40	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.0 m x H = 1.0 m	set	
/ 41	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.1 m x H = 1.1 m	set	
/ 42	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.2 m x H = 1.2 m	set	
/ 43	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 1.3 m x H = 1.3 m	set	
/ 44	Steel slide gate including hoist, guide frame, accessories and spare parts, W= 2.3 m x H = 2.3 m	set	
/ 45	Timber stoplog, W = 2.3 m x H = 2.3 m	set	
/ 46	Steel stand for portable hanger	set	
/ 47	Portable hanger, handling tools and slings for 2.3mx2.3m stoplog	set	

Calculation formula for concrete volume

Levee earth type, long conduit, 1 lane, Slide gate,



No.

① $(L19-0.55)\times H_1\times 2\times 0.3+0.2\times 0.2\times \frac{1}{2}H_1\times 2+0.1\times 0.4\times L19\times 2$
$=0.6\times H_1\times(L19-0.55)+0.04\times H_1+0.1\times 0.4\times L19\times 2$

② $0.7\times(EL2-EL4+0.2)\times(0.25\times 2+B_0)-(B_0+0.3)\times 0.3\times(EL2-EL4)-(B_0H_0-2d^2)\times 0.2-B_0\times 0.2\times(EL2-EL4)$
$=0.7\times(EL2-EL4+0.2)\times(0.5+B_0)-0.3(B_0+0.3)(EL2-EL4)-(B_0H_0-2d^2)\times 0.2-B_0\times 0.2\times(EL2-EL4)$

③ $(B_0+0.55\times 2)\times 1.3\times(EL2-EL4+0.55)-0.7\times(B_0+0.55\times 2-0.3\times 2)\times(EL2-EL4+0.2)-B_0\times(EL2-EL4)\times 0.3-(B_0H_0-2d^2)\times 0.3$
$=1.3\times(B_0+1.1)\times(EL2-EL4-0.55)-0.7\times(B_0+0.5)(EL2-EL4+0.2)-B_0\times(EL2-EL4)\times 0.3-(B_0H_0-2d^2)\times 0.3$

④ $(B_0+2\times t_1+0.4)\times 0.2\times 0.2\times \frac{1}{2}\times 2+(H_0+t_2+t_3)\times 0.2\times 0.2\times \frac{1}{2}\times 2+2t_1H_0\times 0.2+(t_2+t_3)(B_0+2t_1)\times 0.2+2d^2\times 0.3$
$=0.04\{B_0+2\times t_1+0.4+H_0+t_2+t_3\}+2t_1H_0\times 0.2+(t_2+t_3)(B_0+2t_1)\times 0.2+2d^2\times 0.2$

⑤ $\{(H_0+t_2+t_3)\times(B_0+2t_1)-(H_0B_0)+d_2\times 2\}\times(L16-0.5-0.5)$
$=\{(H_0+t_2+t_3)\times(B_0+2t_1)-(H_0B_0)+d_2\times 2\}\times(L16-1.0)$

⑥ $\{(EL6-EL5+0.4)\times(B_0+2t_1)-B_0H_0+d^2\times 2\}\times 0.25+0.25\times 0.25\times \frac{1}{2}\times(EL6-EL5+0.4)\times 2$
$=\{(EL6-EL5+0.4)\times(B_0+2t_1)-B_0H_0+d^2\times 2\}\times 0.25+0.0125\times(EL6-EL5+0.4)\times 2$

⑦ $(L5\times H2-B_0\times H_0+d\times d\times 2)\times 0.25+(0.15\times 0.4\times L21)\times 2$

⑧ $(0.2\times 4+0.1\times 0.4\times 2)\times(EL6-EL5)$
$=0.2\times 0.4\times(EL6-EL5)$

⑨ $0.5\times(t_2+0.25\times L13\times 2)$
$=0.4\times L13$

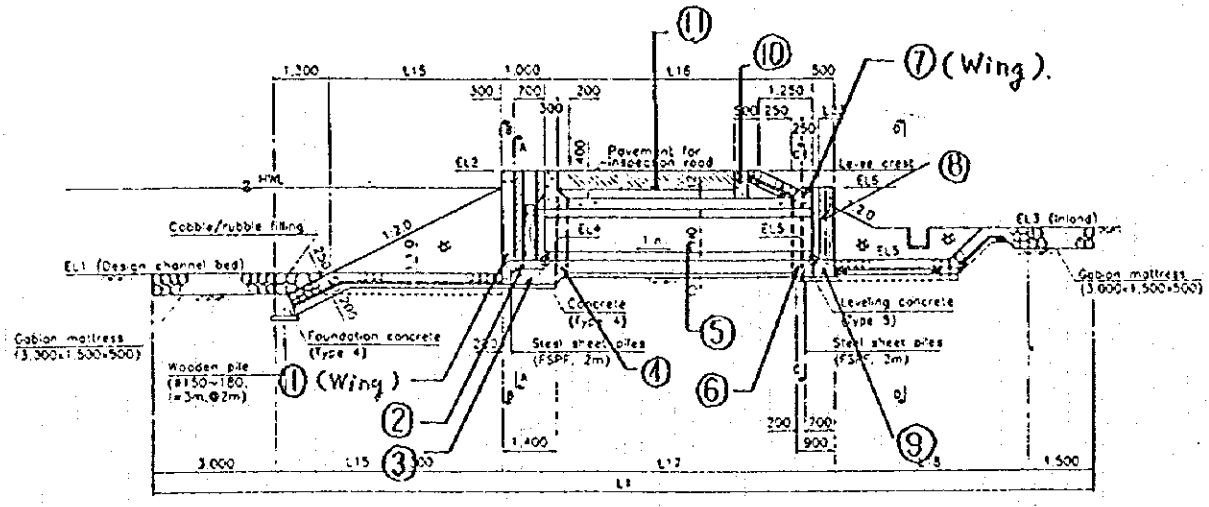
⑩ Partion wall $(EL2-EL4-H_0-t_2)\times 0.3\times(B_0+2t_1)$

⑪ Pavement $(L16-0.3-1.25-0.5)\times 0.4\times(B_0+2t_1)$
$=(L16-2.05)(B_0+2t_1)\times 0.4$

⑫ $\{(L16-0.8)+(L16-1.05)\}\times(EL2-EL4-H_0-t_2)\times \frac{1}{2}\times(B_0+2t_1)$
$=(2\times L16-1.85)\times(EL2-EL4-H_0-t_2)\times \frac{1}{2}\times(B_0+2t_1)$

⑬ Water $L16\times(H_0\times B_0-d\times d\times 2)$

Levee earth type, long conduit, 2 lanes. slide gate.



No.

① $(L19 - 0.55) \times H_1 \times 2 \times 0.3 + 0.2 \times 0.2 \times {}^1/_2 H_1 \times 2 + 0.1 \times 0.4 \times L19 \times 2$
$= 0.6 H_1 (L19 - 0.55) + 0.04 H_1 + 0.08 L19.$

② $\{0.7 \times (B_0 + 0.25 \times 2) \times (EL2 - EL4 + 0.2) - 0.3 (B_0 + 0.15 \times 2) \times (EL2 - EL4)\} \times 2 - (B_0 H_0 - 2d^2) \times 0.2 \times 2 - B_0 \times 0.2 \times (EL2 - EL4)$
$= \{0.7(B_0 + 0.5)(EL2 - EL4 + 0.2) - 0.3(B_0 + 0.3)(EL2 - EL4)\} - (B_0 H_0 - 2d^2) \times 0.2 - B_0 \times 0.2 \times (EL2 - EL4)\} \times 2.$

③ $\{(B_0 + 0.45) \times 1.3 - (B_0 + 0.25 \times 2) \times 0.7\} \times (EL2 - EL4 + 0.55) \times 2 - B_0 \times (EL2 - EL4) \cdot 0.3 \times 2 + 0.7 \times (B_0 + 0.5) \times 0.35 \times 2$
$- (2 B_0 H_0 - 4d^2) \times 0.3.$
$= \{(0.6 B_0 + 0.885)(EL2 - EL4 + 0.55) - B_0 (EL2 - EL4) \times 0.3 + 0.245 (B_0 + 0.5) - (B_0 H_0 + 2d^2) \times 0.3\} \times 2.$

④ $(2 \times B_0 + 1.9) \times 0.2 + 0.2 \times {}^1/_2 \times 2 \times (H_0 + t_3 + t_2) \times 0.2 \times 0.2 \times {}^1/_2 \times 2 + (H_0 + t_3 + t_2) \times (2B_0 + 1.9 - 0.4) \times 0.2 - B_0 H_0 \times 2 \times 0.2$
$+ 2d^2 \times 2 \times 0.2$
$= (2 \times B_0 + 1.9) \times 0.04 + (0.34 + 0.4 B_0)(H_0 + t_3 + t_2) - 2 B_0 H_0 \times 0.2 + 4 d^2 \times 0.2.$

⑤ $2 \times \{(H_0 + t_4 + t_3)(B_0 + t_1 + t_4/2 + (0.45 - t_1) \times 1.3/2 + (0.3 - t_4/2) \times 1.2/2) - B_0 H_0 + d^2 \times 2\} \times (L16 - 1.0)$
$= 2 \times \{(H_0 + t_4 + t_3)(B_0 + t_1 + t_4/2 + 0.45 - 0.6 t_1 - 0.3 t_4) - B_0 H_0 + d^2 \times 2\} \times (L16 - 1.0)$

⑥ $2 \times \{L13 \times (EL6 - EL5 + t_3 + 0.2) - H_0 B_0 + d^2 \times 2\} \times 0.25$
$= 0.5 \times \{L13 \times (EL6 - EL5 + 0.4) - H_0 B_0 + 2d^2\}$

⑦ $(L5 \times H_0 - B_0 \times H_0 \times 2 + d^2 \times 2 \times 2) \times 0.25 + 0.15 \times 0.4 \times L21 \times 2.$
$= (L5 \times H_0 - 2 B_0 H_0 + 4 d^2) \times 0.25 + 0.12 \times L21$

⑧ $(0.2^2 \pi + 0.1 \times 0.4 \times 2 + {}^1/_2 \times 0.3^2 \times \pi + 0.6 \times 0.1) \times (EL6 - EL5)$
$= 0.407 (EL6 - EL5)$

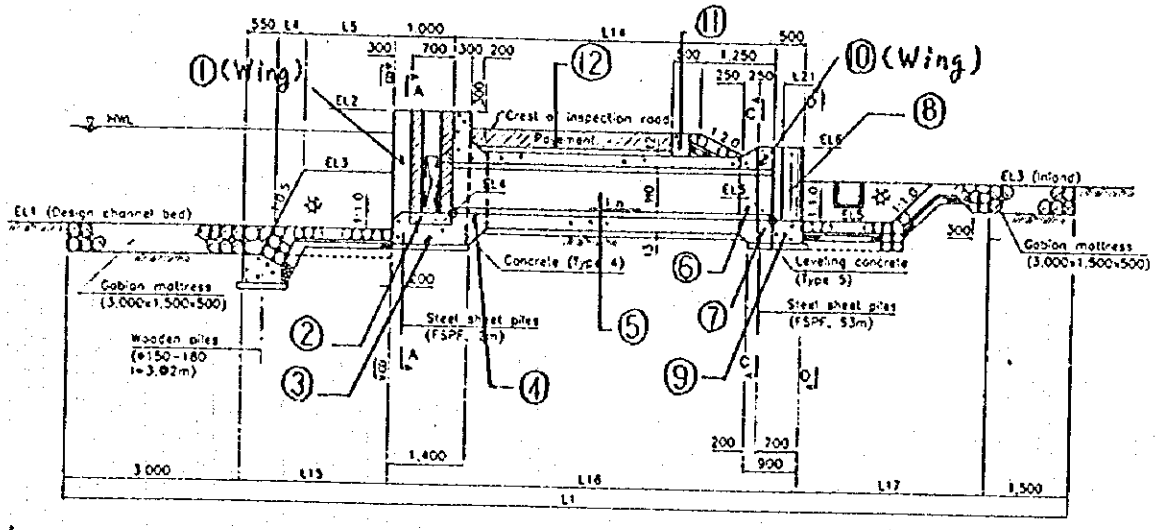
⑨ $0.5 \times (t_3 + 0.2) \times L13 \times 2.$
$= 0.4 \times L13$

⑩ $(EL2 - EL4 - H_0 - t_3) \times 0.3 \times (2B_0 + 2t_1 + t_4)$
$= 0.3 (EL2 - EL4 - H_0 - t_3)(2B_0 + 2t_1 + t_4)$

⑪ Pavement $(L16 - 0.3 - 1.75) \times 0.4 \times (2B_0 + 2t_1 + t_4)$
$= 0.4 (L16 - 2.05)(2B_0 + 2t_1 + t_4)$

⑭ Water $L16 \times (B_0 \times H_0 - 2d^2)$

Levee parapet wall type, long conduit, 1 lane, slide gate.



No.

① $L18 \times H_1 \times 0.3 \times 0.2 + 0.2 \times 0.2 \times 1/2 \times H_1 \times 2 \times 0.1 + 0.1 \times L18 \times 0.4 \times 2$
$= 0.6 \times L18 \times H_1 + 0.04 \times H_1 + 0.08 \times L18.$

② $0.7 \times (B_0 + 1.1 - 0.6) \times (EL2 - EL4 + 0.2) - 0.3 \times (B_0 + 0.15 \times 2)(EL2 - EL4) - 0.2 \times B_0 (EL2 - EL4) - A \times 0.2$
$= 0.7 \times (B_0 + 0.5)(EL2 - EL4 + 0.2) - 0.3 (B_0 + 0.3)$

③ $1.3 \times (B_0 + 1.1) \times H_1 - 0.7 \times (B_0 + 0.5) \times (EL2 - EL4 + 0.2) - B_0 \times 0.3 \times (EL2 - EL4) - (B_0 H_0 - 2d^2) + 0.3$

④ $(B_0 + 2t_1 + 0.4) \times 0.2 \times 0.2 \times 1/2 \times 2 + (H_0 + t_2 + t_3) \times 0.2 \times 0.2 \times 1/2 \times 2 + 2t_1 \times H_0 \times 0.2 + (t_2 + t_3) \times (B + 2t_1) \times 0.2 \times 2 + 2d^2 \times a^2$
$= 0.04 (B_0 + 2t_1 + 0.4 + H_0 + t_2 + t_3) + 0.4 t_1 H_0 + 0.2 (t_3 + t_2) \times (B + 2t_1) + 0.4 d^2.$

⑤ $\{(B_0 + 2t_1)(H_0 + t_2 + t_3) - H_0 B_0 + 2d^2\} \times (L14 - 1.0)$

⑥ $0.25 \times \{(EL6 - EL5 + 0.4) \times (B_0 + 2t_1) \times 2 - B_0 H_0 + 2d^2\} + 0.25 \times 0.25 \times 1/2 \times 2 \times (EL6 - EL5 + 0.4)$
$= 0.25 \times \{(EL6 - EL5 + 0.4) \times (B_0 + 2t_1) - B_0 H_0 + 2d^2\} + 0.0625 (EL6 - EL5 + 0.4)$

⑦ $0.25 \times 2 \times L12 \times (EL6 - EL5 + 0.4) - (B_0 H_0 - 2d^2) \times 0.25$
$= 0.5 \times L12 \times (EL6 - EL5 + 0.4) - (B_0 H_0 - 2d^2) \times 0.25$

⑧ $(0.2^2 \times \pi + 0.4 \times 0.5 \times 2)(EL6 - EL5)$
$= 0.2057 (EL6 - EL5)$

⑨ $L12 \times 0.4 \times 0.5 \times 2$
$= 0.4 \times L12$

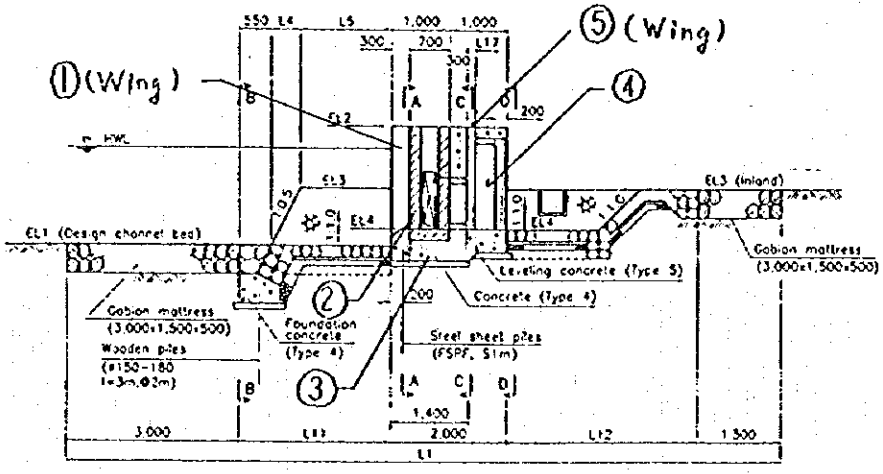
⑩ $L20 \times H_2 \times 0.4 \times 2$
$= 0.8 \times L20 \times H2.$

⑪ $0.3 \times (B_0 + 2t_1) \times (EL2 - EL4 - H_0 - t_2 - 0.3)$

⑫ Pavement $0.4 \times (L14 - 0.3 - 0.5 - 1.25) \times (B_0 + 2t_1)$
$= 0.4 \times (L14 - 2.05)(B_0 + 2t_1)$

⑭ Water $L14 \times (B_0 \times H_0 - 2d^2)$

Levee parapet wall type, short conduit, 1 lane, slide gate.



No.

① $H_1 \times L13 \times 0.3 \times 2 + 0.3 \times 0.2 \times 1/2 \times H_1 \times 2 + 0.1 \times 0.4 \times L13 \times 2$
$= 0.6 \times H_1 \times L13 + 0.04 H_1 + 0.08 \times L13$

② $0.7 \times (B_0 + 0.5) \times (EL2 - EL4 + 0.2) - 0.3 \times (B_0 + 0.3)(EL2 - EL4) - 0.2 \times B_0 \times (EL2 - EL4) - A \times 0.2$
$= 0.7 \times (B_0 + 0.5) \times (EL2 - EL4 + 0.2) - (0.5 B_0 + 0.09 \times EL2 - EL4) - A \times 0.2$

③ $1.3 \times (B_0 + 1.1) \times H_1 - 0.7 \times (B_0 + 0.5) \times (EL2 - EL4 + 0.2) - B_0 \times 0.3 \times (EL2 - EL4) - A \times 0.3$

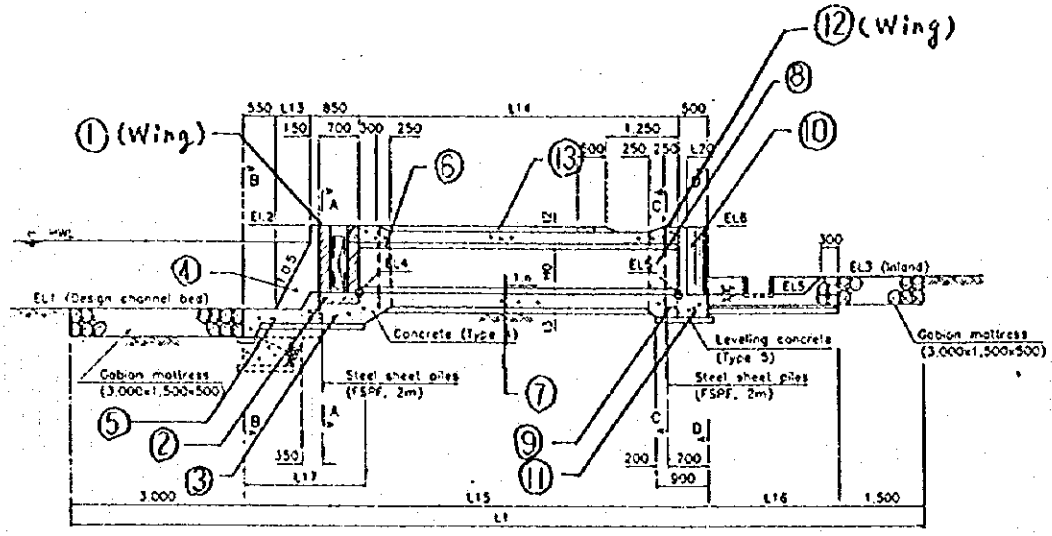
④ $(B0 + 1.1) \times (EL2 - EL4 + 0.4) \times 0.7 - (EL2 - EL4 - 0.2) \times B0 \times 0.7$

⑤ $L1 \times H2 \times 0.25 \times 2 + 0.2 \times 0.2 \times 1/2 \times H2 \times 2$
$= 0.5 \times L1 \times H2 + 0.04 H2$

⑦ Water. $(B_0 \times H_0 - 2d^2) \times 0.5$.

※ $A = B_0 \times H_0 - 2d^2$

Revetment type 1, long conduit, 1 lane, slide gate.



No.

① $\{(L9-0.35)\times0.3\times2 + 0.2\times0.2\times\frac{1}{2}\times2 + 0.2\times(L4-L13+0.35-0.3)\times2\}\times H_1 + 0.1\times0.4\times(L9-0.35-0.2)\times2$.
$= \{0.6\times L9 + 0.4\times(L4-L13) - 0.15\}\times H_1 + 0.08(L9-0.55)$.

② $0.7\times(B_0+0.5)\times(EL2-EL4+0.2) - 0.3\times(B_0+0.3)(EL2-EL4) - B_0\times0.2\times(EL2-EL4) - A\times0.2$

③ $1.15\times(B_0+1.1)\times H_1 - 0.7\times(B_0+0.5)\times(EL2-EL4+0.2) - B_0\times0.15\times(EL2-EL4) - A\times0.3$.

④ $L13\times2\times L13\times\frac{1}{2}\times0.2\times2$
$= 0.4\times L13\times L13$.

⑤ $\{0.25\times(0.55+L13) + 0.15\times(EL4-EL1)\times\frac{1}{2} + 0.25\times0.25\}\times L8$
$= \{0.25\times L13 + 0.075\times(EL4-EL1) + 0.2\}\times L8$

⑥ $(B_0+2t_1+0.4)\times0.2\times0.25\times\frac{1}{2}\times2 + (H_0+t_2+t_3)\times0.2\times0.2\times\frac{1}{2}\times2 + 2t_1H_0\times0.25 + (G+t_2)(B+2t_1)\times0.25 + 2d^2\times0.25$
$= 0.05\times(B_0+2t_1+0.4+H_0+t_2+t_3) + 0.5t_1H_0 + 0.25(t_2+t_3)\times(B+2t_1) + 0.5d^2$

⑦ $\{(B_0+2t_1)\times(H_0+t_2+t_3) - A\}\times(L14-0.55-0.5)$
$= \{(B_0+2t_1)(H_0+t_2+t_3) - A\}\times(L14-1.05)$

⑧ $\{(B_0+2t_1)\times(EL6-EL5+0.4) - A\}\times0.25 + 0.25\times(0.4-t_1)\times\frac{1}{2}\times(EL6-EL5+0.4)\times2$
$= \{(B_0+2t_1)(EL6-EL5+0.4) - A\}\times0.25 + 0.25(0.4-t_1)\times(EL6-EL5+0.4)$

⑨ $(EL6-EL5+0.4)\times0.25\times2\times L11 - A\times0.25$
$= 0.5\times L11\times(EL6-EL5+0.4) - 0.25A$.

⑩ $(0.2^2\pi + 0.4\times0.1\times2)(EL6-EL5)$
$= 0.2057(EL6-EL5)$

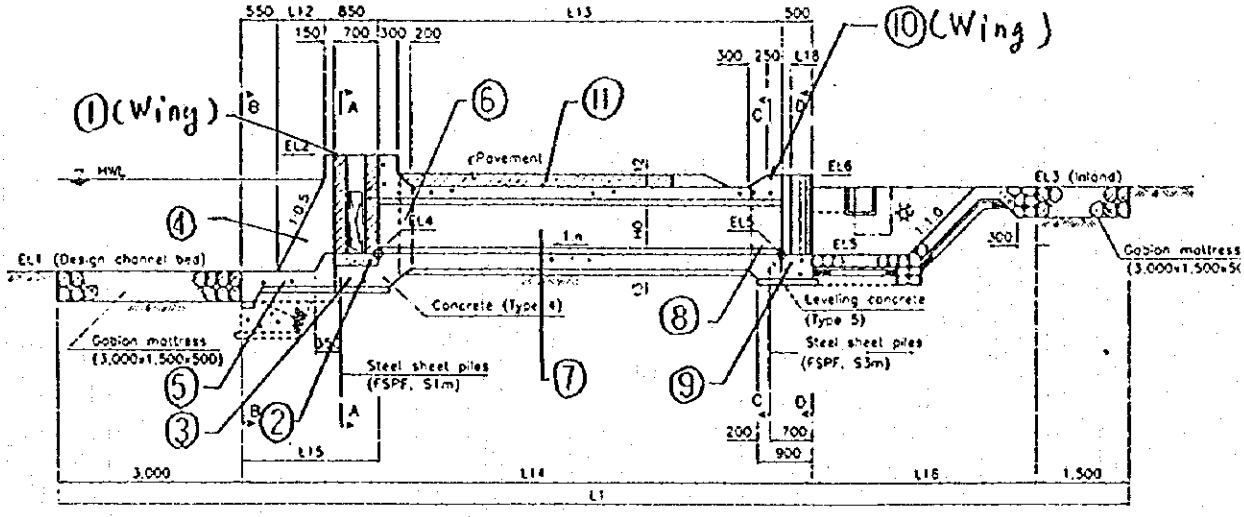
⑪ $0.5\times0.4\times2\times L11$
$= 0.4\times L11$

⑫ $0.4\times H_3\times L19\times2$
$= 0.8\times H_3\times L19$

⑬ $0.4\times(L14-1.25-0.3)\times(B_0+2t_1)$
(Percent) $= 0.4\times(L14-1.55)\times(B_0+2t_1)$

⑮ Water $L14\times A = L14(B_0\times H_0 - \pi d^2)$

Revetment type Ⅱ, long conduit, 1 lane, slide gate.



No.

① $\{0.6 \times L9 + 0.4 \times (L5 - L12) - 0.15\} \times H_1 + 0.08 \times (L9 - 0.55)$

② $0.7 \times (B_0 + 0.5)(EL2 - EL4 + 0.2) - (0.5B_0 + 0.09)(EL2 - EL4) - 0.2A$

③ $1.15(B_0 + 1.1) \times H_1 - 0.7(B_0 + 0.5) \times (EL2 - EL4 + 0.2) - B_0 \times 0.15(EL2 - EL4) - A \times \alpha$

④ $0.4 \times L12 \times L12$

⑤ $\{0.25 \times L12 + 0.075 \times (EL4 - EL1) + 0.2\} \times L8$

⑥ $0.04(B_0 + 2t_1 + 0.4 + H_0 + t_3 + t_3) + 0.4 t_1 H_0 + 0.2(t_1 + t_3)(B + t_4) + 0.4d^2$

⑦ $\{(B_0 + 2t_1)(H_0 + t_1 + t_3) - A\}(L13 - 0.5 - 0.55)$
$= \{(B_0 + 2t_1)(H_0 + t_1 + t_3) - A\}(L13 - 1.05)$

⑧ $\{(EL6 - EL5 + 0.04) \times 2 \times L10 - A\} \times 0.55 - 0.3 \times 0.3 \times \frac{1}{2} \times 2 \times (EL6 - EL5 + 0.4)$
$= (1.1 \times L10 - 0.09) \times (EL6 - EL5 + 0.4) - 0.55A$

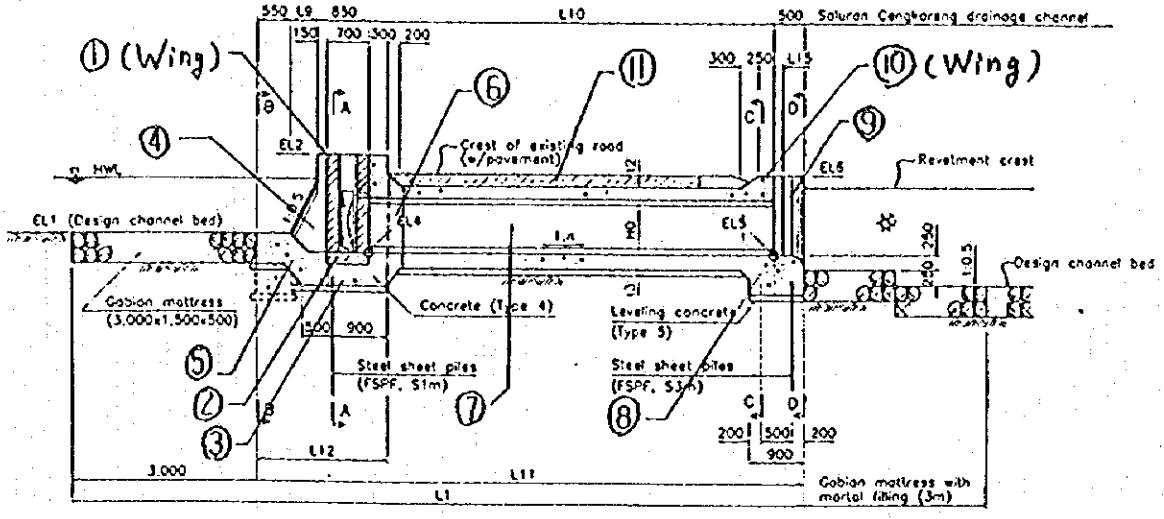
⑨ $0.5 \times 2 \times L10 \times (EL6 - EL5 + 0.4) - B_0 \times (EL6 - EL5) \times 0.5$
$= L10 \times (EL6 - EL5 + 0.4) - 0.5 \times B_0 \times (EL6 - EL5)$

⑩ $0.4 \times H3 \times L17 \times 2$
$= 0.8 \times H3 \times L17$

⑪ (Pavement) $(L13 - 1.55) \times 0.4$

⑬ Water $L13 \times A$
$= L13 \times (B_0 \times H_0 - \pi d^2)$

Revetment type II, long conduit, 2 lane, slide gate.



No.

① $\{0.6 \times L8 + 0.4(L4 - L9) - 0.15\} \times H_1 + 0.08(L8 - 0.55)$

② $1.4 \times (B_0 + 0.5) \times (EL2 - EL4 + 0.2) - (B_0 + 0.18)(EL2 - EL4) - 0.4A$.

③ $\{1.15 \times (B_0 + 0.95) \times H_1 - 0.7 \times (B_0 + 0.5) \times (EL2 - EL4 + 0.2) - B_0 \times 0.15 \times (EL2 - EL4) - A \times 0.3\} \times 0.2$.
$= 2.3(B_0 + 0.95) \times H_1 - 1.4 \times (B_0 + 0.5) \times (EL2 - EL4 + 0.2) - B_0 \times 0.3 \times (EL2 - EL4) - 0.6A$

④ $(HWL - EL4) \times 1/2 \times (HWL - EL4) \times 0.2 \times 2 + (HWL - EL4) \times 0.05 \times 0.15$
$= 0.2(HWL - EL4)^2 + 0.12(HWL - EL4)$

⑤ $\{0.55 \times 0.5 + (H_1 - EL2 + EL4) \times L9\} \times L9$
$= \{0.275 + (H1 - EL2 + EL4) \times L9\} \times L7$

⑥ $(2 \times B_0 + 1.9) 0.04 + (0.3 + 0.4 B_0)(H_0 + t_2 + t_3) - 0.4 B_0 H_0 + 0.8d^2$.

⑦ $2 \times \{(H_0 + t_2 + t_3)(B_0 + t_1 + \frac{t_4}{2} + 0.45 - 0.6 t_1 - 0.3 t_4) - A\}(L10 - 1.05)$

⑧ $\{(EL6 - EL5 + 0.75) \times (B_0 + 1.4) - 2 \times A\} \times 0.55 - 0.15 \times (0.75 - t_3) \times (B_0 + 1.4)$

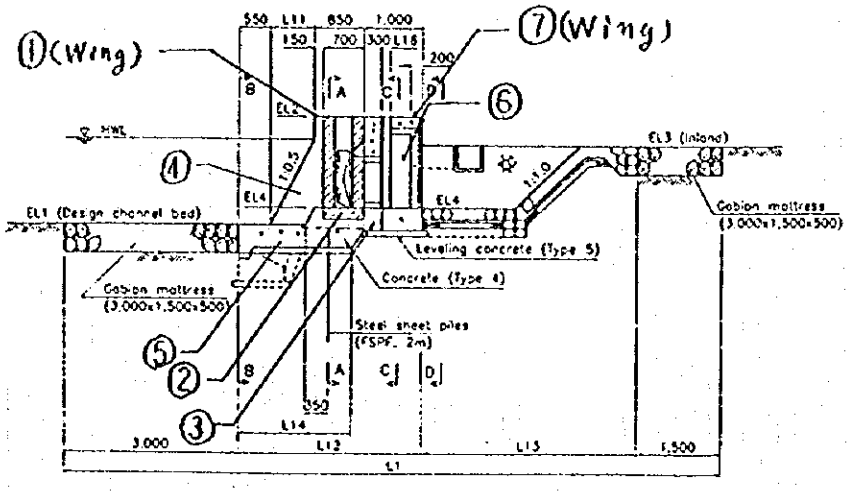
⑨ $(B_0 + 1.4) \times 0.5 \times (EL6 - EL5 + 0.75) - B_0 \times (EL1 - EL5) \times 0.5 \times 2$
$= 0.5(B_0 + 1.4)(EL6 - EL5 + 0.75) - B_0(EL6 - EL5)$

⑩ $(L13 \times H3 \times 0.3 + 0.1 \times 0.4 \times L13) \times 2$
$= 0.6 \times L13 \times H3 + 0.08 \times L13$

⑪ (Pavement) $0.4(2B_0 + 2t_1 + t_4) \times (L10 - 0.3 - 0.55)$
$= 0.4(2B_0 + 2t_1 + t_4)(L10 - 0.85)$

⑬ Water $L10 \times A \times 2$
$= L10 \times (B_0 \cdot H_0 - 2d^2) \times 2$.

Revement type II, short conduit, 1 lane, slide gate.



No.

① $\{0.6 \times L8 + 0.4 \times (L5 - L11) - 0.15\} \times H1 + 0.08 \times (L8 - 0.55)$

② $0.7 \cdot (B_0 + 0.5)(EL2 - EL4 + 0.2) - (0.5B_0 + 0.09)(EL2 - EL4) - A \times 0.2$

③ $1.15 \cdot (B_0 + 1.1)(EL2 - EL4 + 0.4) - 0.7 \cdot (B_0 + 0.5) \cdot (EL2 - EL4 + 0.2) - 0.15B_0(EL2 - EL4) - 0.3A$

④ $H2 \cdot L11 \cdot 1/2 \cdot 0.2 \times 2$
$= 0.2 \times H2 \cdot L11$

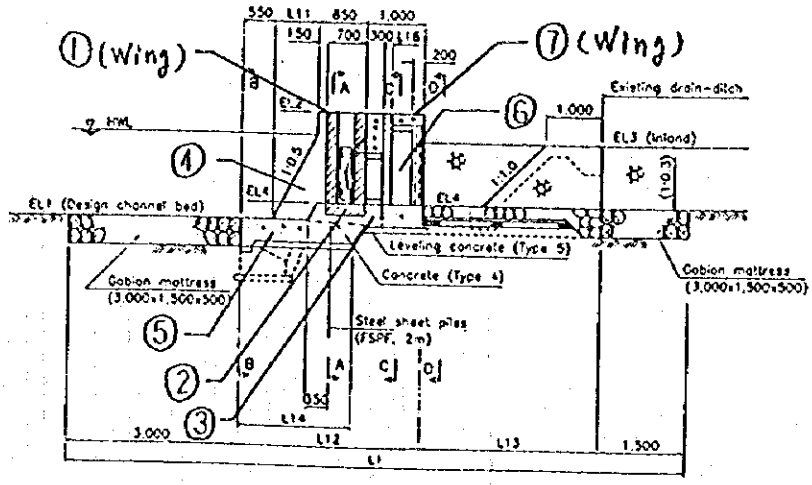
⑤ $0.4 \times (L14 + 0.3) \times L7 + 0.3 \times 0.15 \times 1/2 \times L7$
$= (0.4 \cdot L14 + 0.1425) \times L7$

⑥ $(EL2 - EL4 + 0.4) \cdot 0.7 \cdot (B_0 + 1.1) - 0.7 \cdot (EL2 - EL4 - 0.2) \cdot B_0$

⑦ $H3 \cdot L15 \cdot 0.15 \times 2 + 0.2 \times 0.2 \times 1/2 \cdot 2 \times H3$
$= 0.5 \times H3 \cdot L15 + 0.04 \cdot H3$

⑨ Water. $0.5 \cdot A$
$= 0.5 \times (B_0 \cdot H_0 - \pi d^2)$.

Revement type II, short conduit, others, slide gate.



No.

① $\{0.6\times L8+0.4\times(L5-L11)-0.15\}\times H1+0.08\times(L8-0.55)$

② $0.7\times(B_0+0.5)(EL2-EL4+0.2)-(0.5B_0+0.09)(EL2-EL4)-A\times0.2$

③ $1.15\times(B_0+1.1)(EL2-EL4+0.4)-0.7\times(B_0+0.5)\times(EL2-EL4+0.2)-0.15B_0(EL2-EL4)-0.3A$

④ $H2\times L11\times 1/2\times 0.2\times 2$
$=0.2\times H2\times L11$

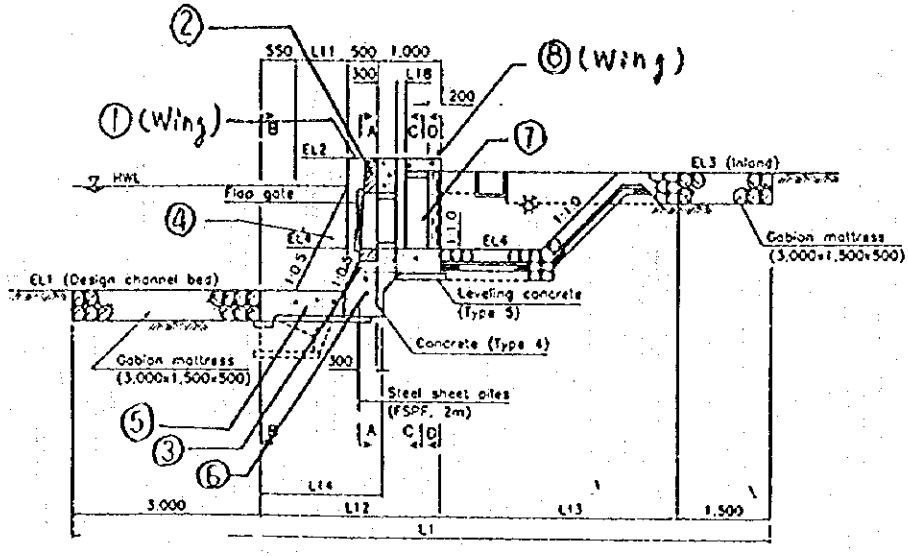
⑤ $0.4\times(L14+0.3)\times L7+0.3\times0.15\times 1/2\times L7$
$=(0.4\times L14+0.1425)\times L7$

⑥ $(EL2-EL4+0.4)\times0.7\times(B_0+1.1)-0.7\times(EL2-EL4-0.2)\times B_0$

⑦ $H3\times L15\times0.25\times2+0.2\times0.2\times1/2\times2\times H3$
$=0.5\times H3\times L15+0.04\times H3$

⑨ Water $0.5\times A$
$=0.5\times(B_0\times H_0-2d^2)$

Revetment type II, short conduit, 1 lane, flap gate.



No.

① $(0.6 \times L8 + 0.4 \times (L5 - L11) - 0.15) \times H1 + 0.08 \times (L8 - 0.55)$

② $0.2 \times (EL2 - EL4 + 0.2)(B_o + 0.3)$

③ $0.8 \times (EL2 - EL4 + 0.4) \times (B_o + 0.9) - 0.5 \times (B_o + 0.3)(EL2 - EL4 + 0.2)$
↳ $- A \times 0.3$.

④ $H2 \times L11 \times 0.2$

⑤ $0.4 \times (L11 + 0.55) \times L7$.

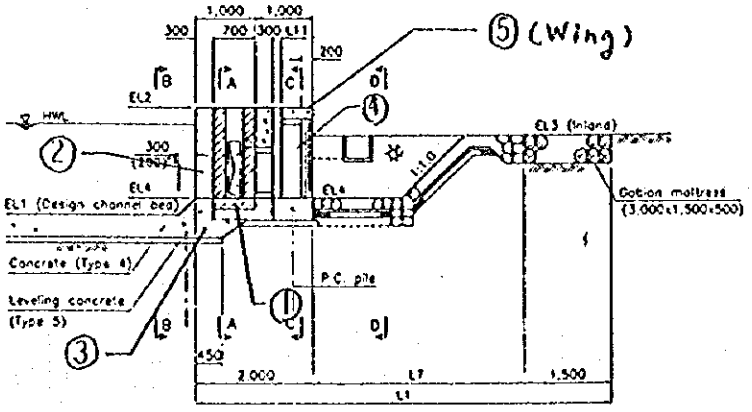
⑥ $0.7 \times 0.7 \times (B_o + 0.9)$

⑦ $(EL2 - EL4 + 0.4) \times 0.7 \times (B_o + 0.9) - (EL2 - EL4 - 0.2) \times 0.7 \times B_o$

⑧ $0.5 \times L6 \times H3 + 0.04 \times H3$

⑩ Water $0.3 \times A$
$= 0.3 \times (B_o \times H_o - \pi d^2)$

Open culvert & concrete ditch, short conduit. 1 lane, Slide gate.



No.

① $0.7\times(B_0+0.5)\times(EL2-EL4+0.2)-0.3\times(B_0+0.3)(EL2-EL4)-B_0\times0.2\times(EL2-EL4)-A\times0.2$

$=0.7\times(B_0+0.5)(EL2-EL4+0.2)-(0.5B_0+0.09)(EL2-EL4)-A\times0.2.$

② $1.3\times(B_0+1.1)\times H_1-0.7\times(B_0+0.5)\times(EL2-EL4+0.2)-B_0\times(EL2-EL4)\times0.3-A\times0.3$

③ $\{(H_3+H_2+L3-0.1)(L3-0.1)\times1/2+(0.45+0.45+0.3)\times0.3\times1/2\}\times(B_1+1.1)$

$=\{(2H_2+L3-0.1)(L3-0.1)\times1/2+0.18\}(B1+1.1)$

④ $(B_0+1.1)\times0.7\times(EL2-EL4+0.4)-0.7\times B_0\times(EL2-EL4-0.2)$

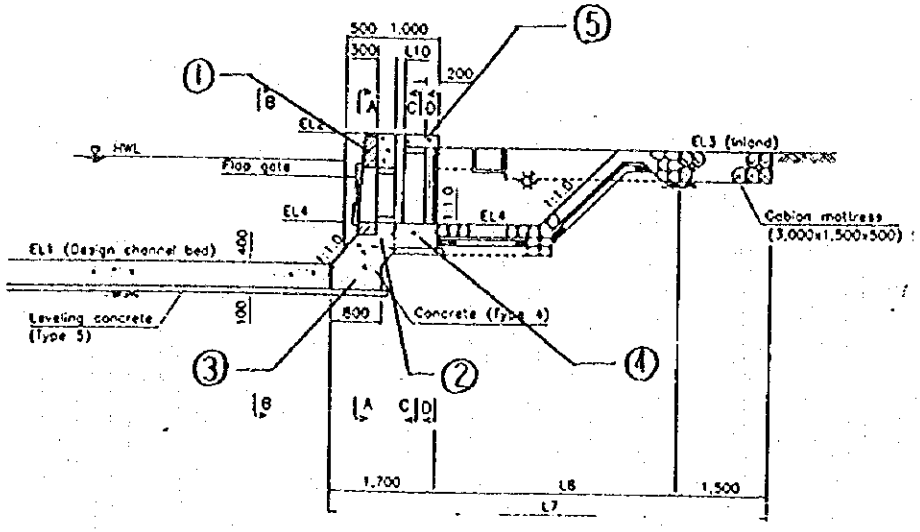
⑤ $L10\times H4\times0.25\times2+0.2\times0.2\times1/2\times H4\times2$

$=0.5\times L10\times H4+0.04\times H4.$

⑦ Water. $0.5\times A$

$=0.5\times(B_0\times H_0-2d^2)$

Open culvert & concrete ditch, short conduit, 1 lane, Flap gate,



No.

① $0.2 \times (EL2 - EL4 + 0.2) \times (B_0 + 0.3) - B_0 H_0 \times 0.2$.

② $0.8 \times (EL2 - EL4 + 0.4) \times (B_0 + 0.9) - 0.5 \times (B_0 + 0.3) \times (EL2 - EL4 + 0.2) - A \times 0.3$.

③ $0.8 \times (0.4 + 0.2) \times (B_0 + 0.9)$

$= 0.48 (B_0 + 0.9)$

④ $(B_0 + 0.9) \times 0.7 \times (EL2 - EL4 + 0.4) - 0.7 \times B_0 \times (EL2 - EL4 - 0.2)$

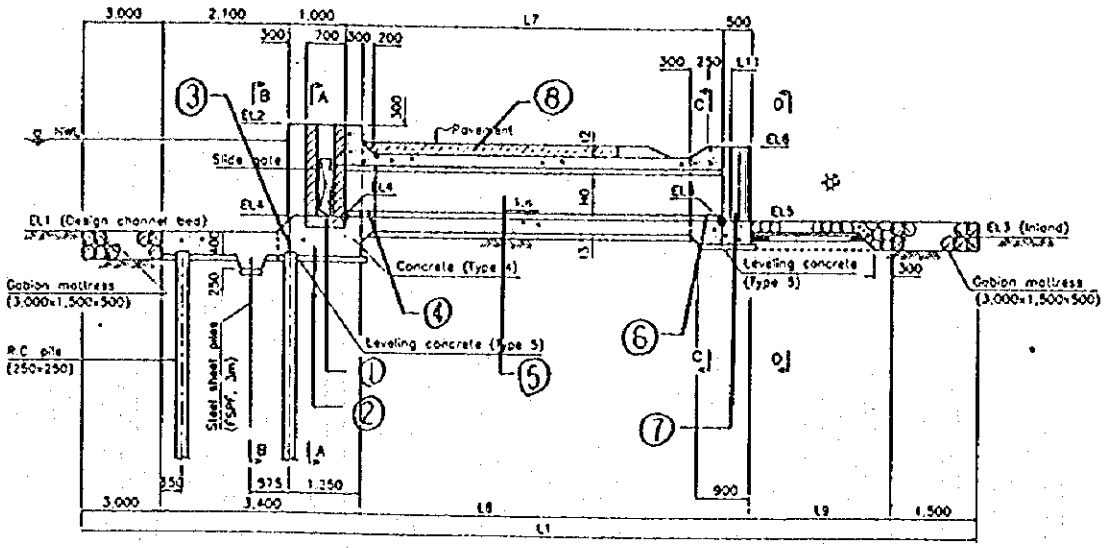
⑤ $0.25 \times L9 \times H3 \times 2 + 0.2 \times 0.2 \times H3 \times 1/2 \times 2$

$= 0.5 \times L9 \times H3 + 0.04 \times H3$.

⑦ Water $A \times 0.3$

$= (B_0 H_0 - 2d^2) \times 0.3$.

Concrete L-type wall, long conduit, 1 lane, slide gate,



NO,

① $0.7\times(B_0+0.5)\times(EL2-EL4+0.2)-0.3\times(B_0+0.3)\times(EL2-EL4)-B_0\times0.2\times(EL2-EL4)-A\times0.2$.

$=0.7\times(B_0+0.5)\times(EL2-EL4+0.2)-(0.5B_0+0.09)(EL2-EL4)-A\times0.2$.

② $1.3\times(B_0+1.1)\times H_1-0.7\times(B_0+0.5)\times(EL2-EL4+0.2)-B_0\times0.3\times(EL2-EL4)^2-A\times0.3$.

③ $(0.2\times0.2\times1/2+0.2\times0.4)\times(B_0+1.1)$

$=0.1(B_0+1.1)$

④ $(B_0+2t_1+0.4)\times0.2\times0.2\times1/2\times2+(H_0+t_1+t_3)\times0.2\times0.2\times\frac{1}{2}\times2+2t_1H_0\times0.2+(t_2+t_3)\times(B+2t_1)\times0.2+2d^2\times0.2$.

$=0.04(B_0+2t_1+0.4+H_0+t_2+t_3)+0.4t_1H_0+0.2(t_2+t_3)(B_0+2t_1)+0.4d^2$.

⑤ $\{(B_0+2t_1)(H_0+t_2+t_3)-A\}\times(L7-0.5-0.55)$

$=\{(B_0+2t_1)(H_0+t_2+t_3)-A\}\times(L7-1.05)$

⑥ $\{(H_3\times L6\times2-A)\times0.55-0.3\times0.3\times1/2\times2<H_3$

$=(1.1\times L6-0.09)H_3-0.55A$.

⑦ $H_3\times0.5\times L6\times2-B_0\times(EL6-EL5)\times0.5$

$=1.5\times H_3\times L6-0.5B_0\times(EL6-EL5)$

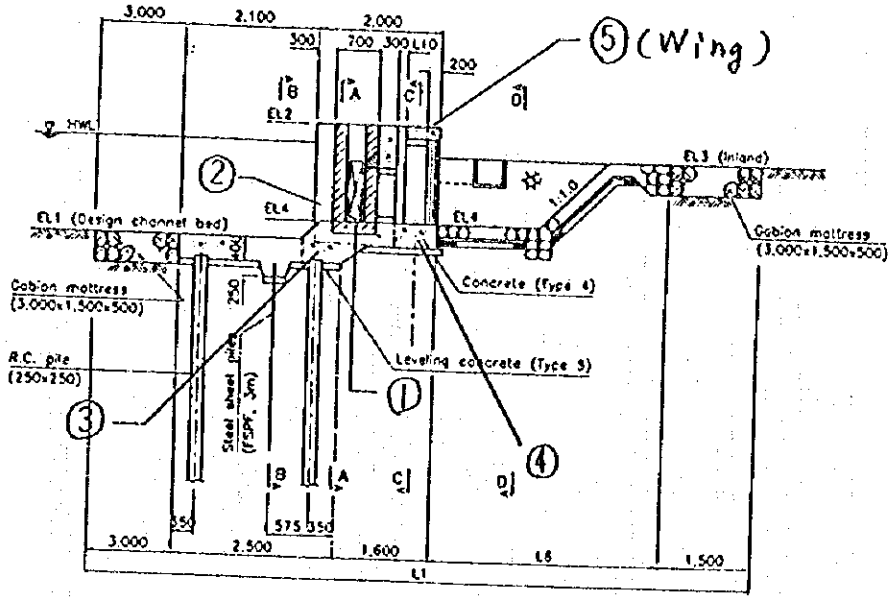
⑧ $(L7-0.3-1.25)\times0.4\times(B_0+2t_1)$

(Pavement) $=0.4\times(B_0+2t_1)(L7-1.55)$

⑩ Water $L7\times A$

$=L7\times(B_0\times H_0-2d^2)$

Concrete L-type wall, short conduit, 1 lane, Slide gate



No.

① $0.7\times(B_0+0.5)\times(EL2-EL4+0.2)-0.3\times(B_0+0.3)(EL2-EL4)-B_0\times0.2$ ↳ $(EL2-EL4)-A\times0.2$.

$=0.7\times(B_0+0.5)(EL2-EL4+0.2)-(0.5B_0+0.09)(EL2-EL4)-A\times0.2$

② $1.3\times(B_0+1.1)\times(EL2-EL4+0.4)-0.7\times(B_0+0.5)\times(EL2-EL4+0.2)-$ ↳ $B_0\times0.3\times(EL2-EL4)-A\times0.3$.

③ $\{(0.4+0.6)\times0.2\times1/2+(0.350+0.650)\times0.3\times1/2\}\times(B_0+1.1)$

$=0.25(B_0+1.1)$

④ $(EL2-EL4+0.4)\times0.7\times(B_0+1.1)-0.7\times B_0\times(EL2-EL4-0.2)$

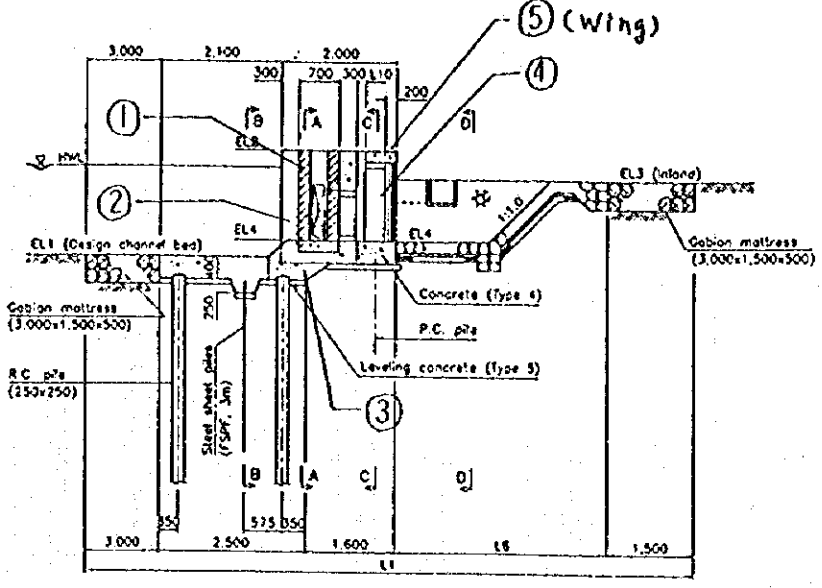
⑤ $H3\times L9\times0.25\times2+0.2\times0.2\times1/2\times2\times H3$

$=0.5\times L9\times H3+0.04\times H3$.

⑦ Water $0.5\times A$

$=0.5\times(B_0\times H_0-2d^2)$

Concrete L-type wall, short conduit. 2 lane, Slide gate.



No.

① $1.4\times(B_0+0.5)(EL2-EL4+0.2)-2(0.5B_0+0.09)(EL2-EL4)-0.4A$.

② $2\{1.3\times(B_0+0.95)\times(EL2-EL4+0.4)-0.7(B_0+0.5)\times(EL2-EL4+0.2)-B_0\times0.3(EL2-EL4)-0.3A\}$

$=2.6\times(B_0+0.95)\times(EL2-EL4+0.4)-1.4(B_0+0.3)(EL2-EL4+0.2)-0.6B_0(EL2-EL4+0.2)-0.6B_0(EL2-EL4)-0.6A$.

③ $0.25\times(2B_0+1.9)$

④ $\{(EL2-EL4+0.4)\times0.7\times(B_0+0.95)-0.7\times B_0\times(EL2-EL4-0.2)\}\times2$.

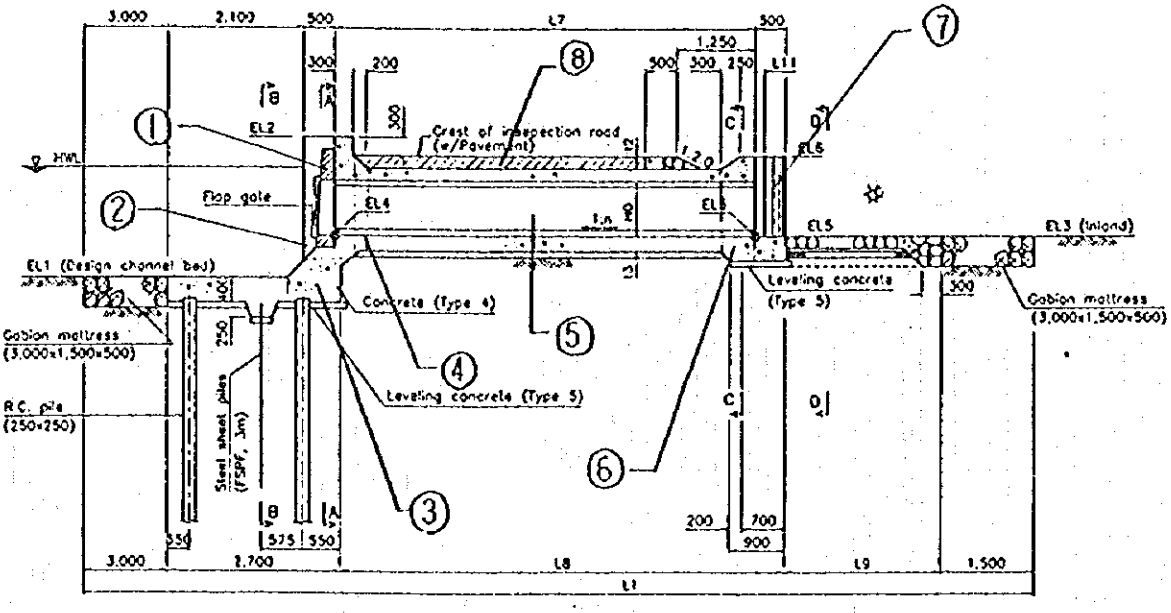
⑤ $L9\times H3\times0.25\times2+0.2\times0.2\times1/2\times2\times H3$

$=0.5\times L9\times H3+0.04\times H3$

⑦ Water $A\times0.5\times2$

$=(B_0\times H_0-2d^2)\times0.5\times2$.

Concrete L-type wall. long conduit, 1 lane, Flap gate,



No

① $0.3\times(B_0+0.3)\times(EL2-EL4+0.2)-A\times0.3$

② $0.8\times(B_0+0.9)\times(H_2-0.2)-0.5\times(B_0+0.3)\times(EL2-EL4+0.2)-A\times0.3$

③ $\{0.6\times0.6+(0.4+0.6)\times0.2/2\}\times(B_0+0.9)$

$=0.46\times(B_0+0.9)$

④ $0.04(B_0+2t_1+0.4+H_0+t_2+t_3)+0.4t_1\times H_0+0.2(t_2+t_3)(B_0+2t_1)+0.4d^2$

⑤ $\{(B_0+2t_1)\times(H_0+t_2+t_3)-A\}\times(L7-0.5-0.55)$

$=\{(B_0+2t_1)\times(H_0+t_2+t_3)-A\}\times(L7-1.05)$

⑥ $\{(EL6-EL5+0.4)\times2\times L6-A\}\times0.55-0.3\times0.3\times1/2\times2\times(EL6-EL5+0.4)$

$=(1.1\times L6-0.09)(EL6-EL5+0.4)-0.55A.$

⑦ $(EL6-EL5+0.4)\times0.5\times2\times L6-B_0\times(EL6-EL5)\times0.5.$

$=(EL6-EL5+0.4)\times L6-0.5B_0\times(EL6-EL5)$

⑧ $(L7-0.3-1.25)\times0.4$

(Pavement)

$=(L7-1.55)\times0.4$

⑨ Water $L7\times A$

$=L7\times(B_0\times H_0-2d^2)$

Table QUANTITY CALCULATION OF CONCRETE WORKS OF SLUICE WAYS

Package 1

No.3.1/15, 16

Kamal Drainage Channel (main)

(unit : cu.m)

	SKM-1L		SKM-2L		SKM-3L		SKM-4L		SKM-5L		SKM-6L		SKM-7L		SKM-8L	
No.	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5
1	3.51		3.51		2.83		2.43		2.36		2.65		2.83		1.93	
2		0.92		0.91		0.97		0.86		0.89		0.86		0.69		0.83
3	3.24		3.20		2.96		3.52		3.61		3.52		3.53		3.42	
4	0.28		0.28		0.57		0.29		0.41		0.41		0.27		0.41	
5	0.69		0.65		2.47		4.67		7.29		6.44		3.74		7.43	
6	0.47		0.44		2.41		0.51		0.60		0.45		0.24		0.59	
7	15.60		8.28		1.78		2.14		2.25		0.47		0.28		2.06	
8	1.39		1.23				0.30		0.31		0.24		0.14		0.31	
9	1.61		1.43				0.32		0.36		0.36		0.30		0.36	
10	1.68		2.52								2.12		1.69			
11																
12																
Total	28.47	0.92	21.55	0.91	13.02	0.97	14.18	0.86	17.20	0.89	16.66	0.86	13.01	0.69	16.52	0.83

Kamal Drainage Channel (main)

(unit : cu.m)

	SKM-1R		SKM-2R		SKM-3R		SKM-4R		SKM-5R		SKM-6R		SKM-7R	
No.	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5
1	2.36		2.40		2.47		2.64		3.33		3.26		3.22	
2		1.82		0.92		0.92		0.82		0.80		0.78		0.79
3	6.22		3.74		3.79		2.92		2.87		2.81		2.88	
4	0.99		0.47		0.50		0.23		0.22		0.20		0.20	
5	11.03		5.26		5.53		0.50		0.49		0.48		0.56	
6	1.28		0.66		0.71		0.36		0.29		0.29		0.41	
7	3.07		2.49		2.62		2.33		4.91		5.04		7.27	
8	0.68		0.35		0.37		0.43		1.08		1.04		1.20	
9	0.72		0.40		0.42		0.51		1.16		1.13		1.35	
10							0.26		1.52		1.26		1.65	
11							0.32							
12							1.99							
Total	26.34	1.82	15.77	0.92	16.41	0.92	12.47	0.82	15.87	0.80	15.51	0.78	18.74	0.79

Kamal Drainage Channel (branch)

(unit : cu.m)

	SKE-1L		SKE-2L		SKE-3L		SKE-4L		SKE-5L		SKE-1R		SKE-2R		SKE-3R	
No.	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5
1	2.57		2.55		2.53		1.88			0.12	2.21		1.88			0.12
2		0.67		0.15		0.15		0.56	0.92			0.56		0.57	0.92	
3	2.18		0.92		0.92		2.21		0.62		1.90		2.25		0.62	
4	0.29		0.15		0.15		0.14		0.99		0.28		0.14		0.99	
5	1.32		0.51		0.51		0.44		0.44		1.32		0.48		0.44	
6	1.76		0.64		0.64		0.36				1.57		0.48			
7	0.44		0.99		0.99		2.21				0.34		6.97			
8			2.36		2.16		0.42						0.49			
9							0.50						0.56			
10							0.26						0.28			
11							0.32						0.34			
12							1.09						1.04			
Total	8.56	0.67	8.11	0.15	7.89	0.15	9.83	0.56	2.97	0.12	7.62	0.56	14.91	0.57	2.97	0.12

Table QUANTITY CALCULATION OF CONCRETE WORKS OF SLUICE WAYS

Package 2

No.3.1/13, 14

Tanjungan Drainage Channel

(unit : cu.m)

	STM-1L		STM-2L		STM-3L		STM-4L		STM-1R		STM-2R		STM-3R	
No.	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5
1	2.51			1.43		0.70		0.72	2.51			0.25		0.71
2		0.69	4.63		2.62		2.70			0.69	1.00		3.40	
3	2.25		0.98		0.48		0.53		2.25		0.60		0.19	
4	0.38		3.39		1.81		1.90		0.38		0.14		0.29	
5	1.41		0.32		0.98		0.69		1.41		1.60		4.48	
6	1.81								1.81		0.69		1.06	
7	1.01								0.75		0.63		0.87	
8														
9														
10														
11														
Total	9.37	0.69	9.31	1.43	5.89	0.70	5.82	0.72	9.11	0.69	4.65	0.25	10.28	0.71

PIK Junction (unit : cu.m)

	SNM-1R	
No.	Type 4	Type 5
1		0.79
2	3.78	
3	1.48	
4	2.05	
5	0.85	
6		
7		
8		
9		
10		
11		
Total	8.16	0.79

Table QUANTITY CALCULATION OF CONCRETE WORKS OF SLUICE WAYS

Package 3

No.3.1/21, 22

Saluran Cengkereng Drainage Channel

(unit : cu.m)

	SCM-1L		SCM-2L		SCM-3L		SCM-4L		SCM-5L		SCM-6L		SCM-7L		SCM-8L	
No.	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5
1		0.91	3.37		3.32		2.79		3.08		2.89		2.75		2.61	
2	4.55			2.00		0.97		0.97		0.86		0.94		0.93		0.85
3	2.49		6.74		3.87		3.87		3.52		3.79		3.74		3.02	
4	2.32		1.05		0.41		2.34		0.41		0.44		0.44		0.29	
5	1.79		17.51		6.79		0.79		4.14		7.50		7.55		0.57	
6			1.33		0.64				0.58		0.65		0.63		0.48	
7			3.36		2.57				2.15		2.48		2.40		3.25	
8			0.71		0.33				0.30		0.33		0.33		0.49	
9			0.76		0.36				0.36		0.38		0.38		0.55	
10															0.28	
11															0.34	
12															2.10	
Total	11.14	0.91	34.82	2.00	18.30	0.97	9.79	0.97	14.54	0.86	18.46	0.94	18.22	0.93	13.98	0.85

Saluran Cengkereng Drainage Channel

(unit : cu.m)

	SCM-1R		SCM-2R		SCM-3R		SCM-4R		SCM-5R		SCM-6R		SCM-7R	
No.	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5
1	2.72		2.96		2.54		3.08		2.90		2.63		2.61	
2		0.85		1.00		0.96		0.95		0.93		0.91		0.83
3	2.68		3.99		3.83		3.79		3.74		3.69		2.96	
4	0.82		2.42		2.31		0.41		0.41		0.44		0.29	
5	2.29		0.91		0.57		6.88		4.21		4.63		0.52	
6	2.19						0.62		0.61		0.62		0.36	
7	1.14						2.44		2.40		2.35		4.90	
8							0.32		0.32		0.32		0.42	
9							0.36		0.36		0.38		0.51	
10													0.26	
11													0.32	
12													1.98	
Total	11.85	0.85	10.28	1.00	9.25	0.96	17.90	0.95	14.95	0.93	15.06	0.91	15.13	0.83

Gede/Bor Drainage Channel

(unit : cu.m)

	SGM-1L		SGM-2L		SGM-3L		SGM-1R		SGM-2R	
No.	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5	Type 4	Type 5
1	2.40		5.03		3.07		2.60		2.58	
2		0.75		2.10		0.75		0.68		0.75
3	2.74		6.15		2.73		2.22		2.42	
4	0.24		0.89		0.24		0.50		0.48	
5	0.50		2.23		0.50		1.50		1.49	
6	0.36		0.92		0.30		1.79		1.92	
7	4.89		21.52		6.90		0.82		0.88	
8	0.43		2.16		1.03					
9	0.51		1.26		1.11					
10	0.26		3.82		0.94					
11	0.32									
12	1.54									
Total	14.20	0.75	43.99	2.10	16.82	0.75	9.43	0.68	9.75	0.75

Calculation formula for Form Work

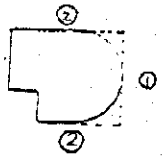
Levee Earth Type 1 Lane (Slidegate) Long Conduit

Inlet - 1

F2

$(L13 \times 2 - B0) / 2 \times (EL6 - EL5) \times 2$ ... ①

$0.500 \times (EL6 - EL5) \times 2 \times 2$ --- ②



Partition Wall (Inlet)

F1

$0.500 \times (0.500 + L8 + 0.600) \times 2 \times 2$ ... ①
$= (0.500 + L8 + 0.600) \times 2$

$0.500 \times (L14 \times 2) \times 2$ ... ②
$= (L14 \times 2)$

$0.300 \times 0.500 \times 2$ ... ③
$= 0.3$

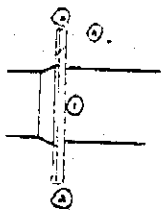
Conduit - 1

F1

$(EL6 - EL5 - H0) \times L5$ ... ①

$(EL6 - EL5 - H0) \times 0.500 \times 2$ ... ②

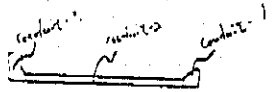
$(0.250 \times \sqrt{2}) \times L5$ ... ③
$= 0.354 \times L5$



Conduit - 2

F1

$(L16 - 0.500 - 0.500) \times t_2 \times 2$
$= (L16 - 1.0) \times t_2 \times 2$



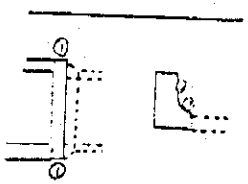
Conduit - 3

F1

$0.500 \times (EL2 - EL5 - H0) \times 2$ ... ①

$0.400 \times (0.550 \times 2 + B0)$ ... ②

$(0.200 \times \sqrt{2}) \times (B0 + 0.55 \times 2) = 0.283 (B0 + 1.1)$ ... ③



Conduit - 4

F1

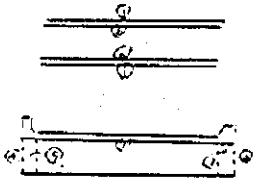
$(L16 - 0.500 - 0.500) \times H0 \times 2$ ... ①
$= (L16 - 1.0) \times H0 \times 2$

$(L5 - B0) \times H2$ ... ②

$(0.250 \times \sqrt{2}) \times H2 \times 2$ ... ③
$= 0.707 H_2$

$(0.550 \times H0) + (L4 - B0 - (0.550 \times 2) \times H1)$ ... ④
$= 0.5 H_0 + (L4 - B0 - 1.1 \times H_1)$

$(0.300 \times \sqrt{2}) \times H1 \times 2$ ... ⑤
$= 0.849 H_1$



F2

$L16 \times H0 \times 2$ ... ⑥

$L16 \times B0$ ... ⑦

Conduit - 5

F1

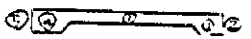
$(1.000 \times 0.400) \times 2$ ... ①
$= 2.8$

$L5 \times 0.400$ ... ②

$0.200 \times (L17 - 1.000 - 1.500) \times 2$ ... ③
$= 0.4 \times (L17 - 2.5)$

$(1.500 \times 0.500) \times 2$ ... ④
$= 1.5$

$L4 \times 0.500$ ... ⑤



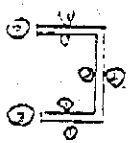
Partition Wall (Outlet)

F1

$0.500 \times (L6 + 0.500 + 1.000) \times 2 \times 2$ ... ①
$= 2(L6 + 1.5)$

$0.500 \times (L2 - B0 - 0.550 \times 2) \times 2$ ... ②
$= L2 - B0 - 1.1$

$0.300 \times 0.500 \times 2$ ... ③
$= 0.2$



SW-72

Outlet - 1

F1

1.300 × (EL2 - EL4) × 2 ... ① = 2.6 (EL2 - EL4)

0.550 × (EL2 - EL4) × 1/2 ... ② = 1.1 (EL2 - EL4)

(0.550 - 0.300) × (EL2 - EL4) × 2 ... ④ = 0.5 (EL2 - EL4)

0.700 × (EL2 - EL4) × 2 ... ⑤ = 1.4 (EL2 - EL4)

F2

0.300 × (EL2 - EL4) × 2 ... ③ = 0.6 × (EL2 - EL4)

Outlet - 2

F2

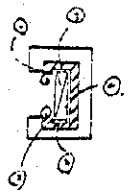
0.200 × (EL2 - EL4 + 0.200) × 2 ... ①

0.150 × (EL2 - EL4 + 0.200) × 2 ... ②

0.300 × (EL2 - EL4 + 0.200) × 2 ... ③

① + ② + ③ = 1.3 (EL2 - EL4 + 0.2)

(B0 + 0.150 × 2) × (EL2 - EL4 + 0.200) - (B0 × H0) ... ④



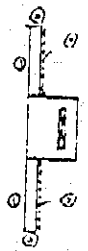
Outlet - 3

F1

(L4 - B0 - 0.550) × H1 ... ①

0.400 × H1 × 2 ... ② = 0.8 H1

(L4 - B0 - 1.1) × H1 × 2 ... ③



Foundation Concrete

F1

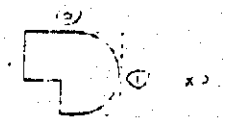
L2 × 2.500 ... ①

L2 × (0.5 - $\sqrt{0.3^2 - 0.135^2}$) = L2 × 0.134 ... ②

L2 × 0.3 ... ③

Levee Earth Type 2 Lane (Slide gate) Long Conduit

Inlet - 1

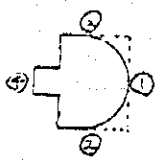


F2

$0.400 \times (EL6 - EL5) \times 2 \cdots ①$

$0.500 \times (EL6 - EL5) \times 2 \times 2 \cdots ②$

Inlet - 2



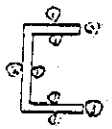
F2

$0.600 \times (EL6 - EL5) \cdots ①$

$0.500 \times (EL6 - EL5) \times 2 \cdots ②$

$*EL6 - EL5$

Partition Wall (Inlet)



F1

$0.500 \times (0.500 + L8 + 0.600) \times 2 \times 2 \cdots ①$

$= 2.0 \times (1.1 + L8)$

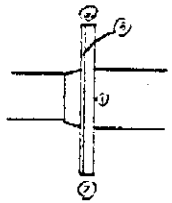
$0.500 \times (L14 \times 2) \times 2 \cdots ②$

$* L14 \times 2$

$0.300 \times 0.500 \times 2 \cdots ③$

$= 0.3$

Conduit - 1



F1

$L5 \times (EL6 - EL5 - H0) \cdots ①$

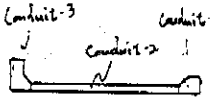
$0.500 \times (EL6 - EL5 - H0) \times 2 \cdots ②$

$(250 \times \sqrt{2}) \times L5 \cdots ③$

$* EL6 - EL5 = H0$

$= 0.354 \times L5$

Conduit - 2

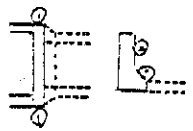


F1

$(L16 - 0.500 - 0.500) \times t2 \times 2$

$= (L16 - 1.0) \times t_2 \times 2$

Conduit - 3



F1

$0.500 \times (EL2 - EL5 - H0) \times 2 \cdots ①$

$0.400 \times 0.550 \times 2 + B0 \times 2 + 0.800) \cdots ②$

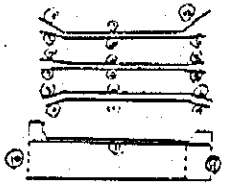
$* EL2 - EL5 = H0$

$* 0.4 \times (1.9 + B0 \times 2)$

$(200 \times \sqrt{2}) \times (B0 \times 2 + 550 \times 2 + 800) \cdots ③$

$= 0.283 (2 \times B0 + 1.9)$

Conduit - 4



F1

$(L16 - 0.900 - 1.700) \times H0 \times 2 \cdots ①$

$* (L16 - 2.6) \times 2 = H0$

$\sqrt{1.550^2 + 1.400^2} \times H0 \times 2 \cdots ③$

$= 3.01 \times H0$

$\sqrt{0.400^2 + 0.900^2} \times H0 \times 2 \cdots ④$

$* 1.970 = H0$

$(L5 - B0 \times 2) \times H2 \cdots ⑨$

$(L4 - B0 \times 2) \times H1 \cdots ⑩$

F2

$(L16 - 0.900 - 1.700) \times H0 \times 2 \times 2 \cdots ② = (L16 - 2.6) \times H0 \times 4$

$\sqrt{1.400^2 + t1^2} \times H0 \times 2 \cdots ⑤ = \sqrt{1.96 + t1^2} \times H0 \times 2$

$\sqrt{0.900^2 + t1^2} \times H0 \times 2 \cdots ⑥ = \sqrt{0.81 + t_1^2} \times H0 \times 2$

$\sqrt{((1.800 - t4)/2)^2 + 1.400^2} \times H0 \times 2 \cdots ⑦ = \sqrt{\frac{(1.8 - t_4)^2}{4} + 1.96} \times H0 \times 2$

$\sqrt{((0.600 - t4)/2)^2 + 0.900^2} \times H0 \times 2 \cdots ⑧$

$L16 \times (B0 \times 2) \cdots ⑪$

SW-44

Conduit - 5

F1

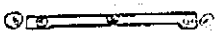
1000 × 0400 × 2 … ①
= 0.8

L5 × 0400 … ②

t3 × (L17 - 1000 - 1500) × 2 … ③
= 2 × t3 × (L17 - 2.5)

1500 × 0500 × 2 … ④
= 1.5

L4 × 0500 … ⑤



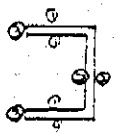
Partition Wall (outlet)

F1

(L6 + 0500 + 1000) × 0500 × 2 × 2 … ①
= 2 × (L6 + 1.5)

(L2 - B0 × 2 - 0550 × 2 - B00) × 0500 × 2 … ②
= L2 - B0 × 2 - 1.9

0300 × 0500 × 2 … ③
= 0.3



Outlet - 1

F1

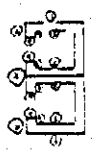
1300 × (EL2 - EL4) × 2 … ①
= 2.6 (EL2 - EL4)

0550 × (EL2 - EL4) × 2 … ②
= 1.1 (EL2 - EL4)

0800 × (EL2 - EL4) … ③

(0550 - 0300) × (EL2 - EL4) × 2 × 2 … ⑤
= EL2 - EL4

0700 × (EL2 - EL4) × 2 × 2 … ⑥
= 2.8 × (EL2 - EL4)



F2

0300 × (EL2 - EL4) × 2 × 2 … ④
= 1.2 (EL2 - EL4)

Outlet - 2

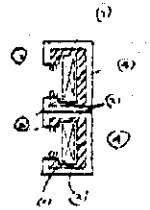
F2

0200 × (EL2 - EL4 + 0200) × 2 × 2 … ①
= 0.8 × (EL2 - EL4 + 0.2)

0150 × (EL2 - EL4 + 0200) × 2 × 2 … ②
= 0.6 × (EL2 - EL4 + 0.2)

0300 × (EL2 - EL4 + 0200) × 2 × 2 … ③
= 1.2 (EL2 - EL4 + 0.2)

(B0 + 0150 × 2) × (EL2 - EL4 + 0200) - (B0 × H0 × 2) … ④
= (B0 + 0.3) × (EL2 - EL4 + 0.2) - (B0 × H0 × 2)



Outlet - 3

F1

(L4 - B0 × 2 - 0550 × 2) × H1 … ①
= (L4 - B0 × 2 - 1.1) × H1

0400 × H1 × 2 … ②
= 0.8 × H1

(L4 - B0 × 2 - 0550 × 2) × $\sqrt{0100^2 + H1^2}$ … ③
= (L4 - B0 × 2 - 1.1) × $\sqrt{H1 \times 2}$

Foundation Concrete

L2 × 0500 … ①

(L2 - 0300 × 2) × 0500 × $\sqrt{0300^2 - 0135^2}$ … ②
= L2 × 0.134

L2 × 0.3 … ③

SW-75

1 Lane

Levee Parapet Wall Type Long Conduit. (Slide gate)

Inlet - 1

F2

$0.400 \times (EL6 - EL5) \times 2 = 0.8(EL6 - EL5)$

$0.500 \times (EL6 - EL5) \times 2 \times 2 = 2(EL6 - EL5)$

F1

$0.400 \times (EL6 - EL5) \times 2 = 0.8 \times (EL6 - EL5)$

Partition Wall (Inlet)

F1

$0.500 \times (0.500 + L7 + 0.600) \times 2 \times 2 = 2(L7 + 1.1)$

$0.500 \times (L13 \times 2) \times 2 = L13 \times 2$

$0.300 \times 0.500 \times 2 = 0.3$

Conduit - 1

F1

$(B0 + 0.400 \times 2) \times (EL6 - EL5 - H0)$

$0.250 \times (EL6 - EL5 - H0) \times 2 = 0.5(EL6 - EL5 - H0)$

$(0.250 \times \sqrt{5}) \times (B0 + 0.400 \times 2) = 0.354(B0 + 0.8)$

Conduit - 2

F1

$(L14 - 0.500 - 0.500) \times t2 \times 2$

$= (L14 - 1.0) \times t_2 \times 2$

Conduit - 3

F1

$0.500 \times (EL2 - EL5 - H0) \times 2$

$= EL2 - EL5 - H_0$

$(B0 + 0.150 \times 2 + 0.300 \times 2) \times 0.400$

$= 0.4(B0 + 0.9)$

$(0.200 \times \sqrt{2}) \times (B0 + 0.150 \times 2 + 0.300 \times 2)$

$= 0.283(B0 + 0.9)$

Conduit - 4

F1

$L14 \times H0 \times 2$

$(L5 - B0) \times H2$

$(0.250 \times \sqrt{2}) \times H2 \times 2$

$= 0.707 \times H_2$

$(0.550 \times H0) + (L2 - B0 - (0.550 \times 2) \times H1)$

$(0.300 \times \sqrt{2}) \times H1 \times 2$

$= 0.849 \times H_1$

F2

$L14 \times H0 \times 2$

$L14 \times B0$

Conduit - 5

F1

$1.000 \times 0.400 \times 2$

$= 0.8$

$(L19 \times 2) \times 0.400$

$= 0.8 \times L19$

$0.200 \times (L16 - 1.000 - 1.500) \times 2$

$= 0.4 \times (L16 - 2.5)$

$1.500 \times 0.500 \times 2$

$= 1.5$

$L2 \times 0.500$

$= 0.5L2$

Outlet - 1

F1

$1300 \times (EL2 - EL4) \times 2$
$= 2.6 (EL2 - EL4)$
$0.550 \times (EL2 - EL4) \times 2$
$= 1.1 (EL2 - EL4)$
$(0.550 - 0.300) \times (EL2 - EL4) \times 2$
$= 0.5 (EL2 - EL4)$
$0.700 \times (EL2 - EL4) \times 2$
$= 1.4 (EL2 - EL4)$

F2

$0.300 \times (EL2 - EL4) \times 2$
$= 0.6 (EL2 - EL4)$

Outlet - 2

F2

$0.200 \times (EL2 - EL4 + 0.200) \times 2$
$0.150 \times (EL2 - EL4 + 0.200) \times 2$
$0.300 \times (EL2 - EL4 + 0.200) \times 2$
$= (0.4 + 0.3 + 0.6)(EL2 - EL4 + 0.2)$
$= 1.3 (EL2 - EL4 + 0.2)$

$(B0 + 0.150 \times 2) \times (EL2 - EL4 + 0.200) - (B0 \times H0)$
$= (B0 + 0.3)(EL2 - EL4 + 0.2) - (B0 \times H0)$

Parapet Wall

F1

$(L2 - (B0 + 0.150 \times 2)) \times H1 \times 2 \times 2$
$300 \times H1 \times 2 = 0.6 \times H1$
$= (L2 - 0.3 - B0) \times H1 \times 4$

Foundation Concrete

F1

$L2 \times 0.500 \times 2$
$= L2$

SW-76

SW-77

Levee Parapet Wall Type Short Conduit. (Slide gate)

1 Lane

Inlet

F2

$0.550 \times (EL2 - EL4) \times 2$
$= 1.1 \times (EL2 - EL4)$

$(B0 + 0.200 \times 2) \times 0.200$
$+ (B0 + 0.4) \times 0.2$

$(L10^2 / 2) \times 2$
$= L10^2$

F1

$L16 \times H2 \times 2$

$(B0 + 0.550 \times 2) \times (H2 - (EL3 - EL4))$

Conduit

F1

① $2.000 \times ((EL2 - EL4) + (H2 - (EL3 - EL4))) \times 2$
$+ 4.0 (EL2 - EL3 + H2)$

② $0.250 \times (EL2 - EL4) \times 2$
$+ 0.5 (EL2 - EL4)$

③ $0.700 \times (EL2 - EL4) \times 2$
$+ 1.4 (EL2 - EL4)$

④ $(B0 + 0.250 \times 2) \times (EL2 - EL4) - (B0 \times H0)$
$+ (B0 + 0.5) \times (EL2 - EL4) - (B0 \times H0)$

⑤ $t1 \times (B0 + 0.550 \times 2)$
$+ t1 \times (B0 + 1.1)$

F2

⑥ $1.200 \times (EL2 - EL4) \times 2$
$= 2.4 (EL2 - EL4)$

⑦ $0.550 \times ((EL2 - EL4) + (H2 - (EL3 - EL4))) \times 2$
$+ 1.1 \times (EL2 - EL3 + H2)$

⑧ $0.300 \times (EL2 - EL4) \times 2$
$+ 0.6 \times (EL2 - EL4)$

⑨ $0.200 \times (EL2 - EL4 + 0.200) \times 2$
$+ 0.4 \times (EL2 - EL4 + 0.2)$

⑩ $0.150 \times (EL2 - EL4 + 0.200) \times 2$
$= 0.3 \times (EL2 - EL4 + 0.2)$

⑪ $0.300 \times (EL2 - EL4 + 0.200) \times 2$
$+ 0.6 \times (EL2 - EL4 + 0.2)$

⑫ $(B0 + 0.150 \times 2) \times (EL2 - EL4) - (B0 \times H0)$
$+ (B0 + 0.3) \times (EL2 - EL4) - (B0 \times H0)$

Parapet Wall

F1

$(L2 - (B0 + 0.550 \times 2)) \times H1 \times 2 \times 2$
$= 4 \times (L2 - B0 - 1.1) \times H1$

$0.300 \times ((EL2 - EL4) + (H2 - (EL3 - EL4))) \times 2$
$+ 0.6 (EL2 - EL3 + H2)$

Foundation Concrete

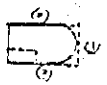
F1

$L2 \times 0.500 \times 2$
$= L2$

Revetment Type I 1 Lane (Slide gate) Long Conduit

Inlet

F2



$0.400 \times (EL6 - EL5) \times 2$ … ①
$= 0.8 \times (EL6 - EL5)$

$0.700 \times (EL6 - EL5) \times 2 \times 2$ … ②
$= 2.0 \times (EL6 - EL5)$

Partition Wall

F1

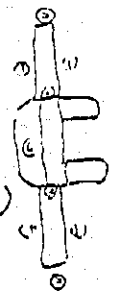
$(L6 + 0.600 + 0.500) \times 0.300 \times 2 \times 2$ … ①
$= 2 \times (L6 + 1.1)$

$(L12 \times 2) \times 0.500 \times 2$ … ②
$= 2 \times L12$

$0.300 \times 0.500 \times 2$ … ③
$= 3.0$

Conduit - 1

F1



$H3 \times L19 \times 2 \times 2$ … ① $= 4 \times H3 \times L19$

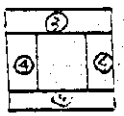
$0.400 \times H3 \times 2$ … ② $= 0.8 \times H3$

$0.400 \times H0 \times 2$ … ④ $= 0.8 \times H0$

$(B0 + 0.400 \times 2) \times (6.200 + t1)$ … ⑤ $= (B0 + 0.8) \times (0.2 + t1)$

$(6.250 \times \sqrt{2}) \times (B0 + 0.400 \times 2)$ … ⑥ $= 0.354 \times (B0 + 0.8)$

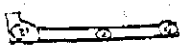
F2



$(EL6 - EL5 - H0) \times (B0 + 0.400 \times 2)$ … ③
$= (EL6 - EL5 - H0) \times (B0 + 0.8)$

Conduit - 2

F1



$(EL6 - EL5 - H0) \times 0.500 \times 2$ … ①
$= EL6 - EL5 - H0$

$(L14 - 0.500 - 0.550) \times t2 \times 2$ … ②
$= (L14 - 1.05) \times t2 \times 2$

$0.550 \times (EL2 - EL4 - H0) \times 2$ … ③
$= 1.1 (EL2 - EL4 - H0)$

Conduit - 3

F2

$H0 \times L14 \times 2$ … ①

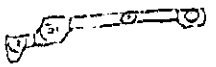
$B0 \times L14$ … ②

F1

$H0 \times L14 \times 2$ … ①

Conduit - 4

F1



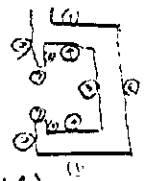
$1.000 \times (6.200 + t1) \times 2$ … ①
$= 2.0 (0.2 + t1)$

$(L14 - 0.500 - 0.550) \times t3 \times 2$ … ②
$= (L14 - 1.05) \times t3 \times 2$

$(1.950 + L13) \times 0.800 \times 2$ … ③
$= 1.6 (1.95 + L13)$

Outlet - 1

F1



$2.3 (EL2 - EL4) - 0.3 \times 2$ … ①
$= 2.3 (EL2 - EL4) - 0.6$

$(6.300 + 0.250) \times (EL2 - EL4) \times 2$ … ②
$= 1.1 (EL2 - EL4)$

$0.250 \times (EL2 - EL4) \times 2$ … ③
$= 0.5 (EL2 - EL4)$

$0.700 \times (EL2 - EL4) \times 2$ … ④
$= 1.4 (EL2 - EL4)$

$(B0 + 0.250 \times 2) \times (EL2 - EL4)$ … ⑤
$= (B0 + 0.5)(EL2 - EL4)$

$(B0 + 0.250 \times 2 + 0.300 \times 2) \times (EL2 - EL4) - (B0 \times H0)$ … ⑥
$= (B0 + 1.1) \times (EL2 - EL4) - (B0 \times H0)$

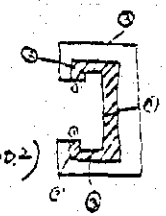
$5.3 (EL2 - EL4) - 0.6$

F2

$0.150 \times (EL2 - EL4) \times 2$ … ⑦

Outlet - 2

F2



0.200 × (EL2 - EL4 + 0.200) × 2 .. ①
0.150 × (EL2 - EL4 + 0.200) × 2 .. ②
0.300 × (EL2 - EL4 + 0.200) × 2 .. ③
1.3 × (EL2 - EL4 + 0.2)

(B0 + 0.150 × 2) × (EL2 - EL4 + 0.200) - (B0 × H0) .. ④
(B0 + 0.3) × (EL2 - EL4 + 0.2) - (B0 × H0)

Outlet - 3

F1

(L2 - B0 - 0.550 × 2) × (EL2 - EL4) .. ①
(L2 - B0 + 1.1) × (EL2 - EL4)
(L4 - L13 + 0.350) × (EL2 - EL4) × 2 .. ②

Foundation Concrete

F1

L2 × 0.700 × 2
= L2

SW-49

Revetment Type II 1 Lane (slide gate) Long Conduit

Inlet

F2

$0.400 \times (EL6-EL5) \times 2$ ·· ① ·· $= 0.8 \times (EL6-EL5)$

$0.500 \times (EL6-EL5) \times 2 \times 2$ ·· ② · $2.0(EL6-EL5)$

Conduit -1

F1

$L17 \times H3 \times 2 \times 2$ ··· ①
$= L17 \times H3 \times 4$

$0.400 \times H3 \times 2$ / ··· ②
$= 0.8\,H3$

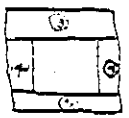
$0.400 \times HO \times 2$ ·· ④.
$= 0.8\,HO$

$(BO + 0.400 \times 2) \times 0.200 \times t1)$ ·· ⑤
$= (BO + 0.8) \times (0.2 \times T.)$

$(250 - \sqrt{2}) \times (BO + 0.400 \times 2)$ ·· ⑥
$= 0.374 \times (BO + 0.8)$

F2

$(EL6 - EL5 - HO) \times (BO + 0.400 \times 2)$ ··· ③
$= (EL6 - EL5 - HO) \times (BO + 0.8)$



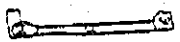
Conduit -2

F1

$(EL6 - EL5 - HO) \times 0.500 \times 2$ ·· ①

$(L13 - 0.550 - 0.500) \times t2 \times 2$ ·· ②
$= EL6 - EL5 - HO$
$= (L13 - 1.05) \times t2 \times 2$

$0.550 \times (EL2 - EL4 - HO) \times 2$ ·· ③.
$= 1.1 \times (EL2 - EL4 - HO)$



Conduit - 3

F2

$HO \times L13 \times 2$ ·· ①

$BO \times L13$ ·· ②

F1

$HO \times L13 \times 2$ ··· ①.

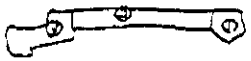
Conduit -4

F1

$1.000 \times (0.200 + t1) \times 2$ ··· ①
$= 2 \times (0.2 + T.)$

$(L13 - 0.500 - 0.550) \times t3 \times 2$ ··· ②
$= (L13 - 1.1) \times t3 \times 2$

$(1.950 + L12) \times 0.800 \times 2$ ··· ③
$= 1.6 \times (1.95 + L12)$



Outlet -1

F1

$1.150 \times (EL2 - EL4) \times 2$ ··· ①
$= 2.3 \times (EL2 - EL4)$

$(0.200 + 0.250) \times (EL2 - EL4) \times 2$ ·· ②
$= 1.1 \times (EL2 - EL4)$

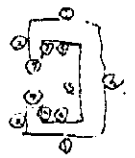
$0.250 \times (EL2 - EL4) \times 2$ ·· ③
$= 0.5 \times (EL2 - EL4)$

$0.700 \times (EL2 - EL4) \times 2$ ·· ④
$= 1.4 \times (EL2 - EL4)$

$(BO + 0.250 \times 2) \times (EL2 - EL4)$ ·· ⑤
$= (BO + 0.5) \times (EL2 - EL4)$

$(BO + 0.250 \times 2 + 0.300 \times 2) \times (EL2 - EL4) - (BO \times HO)$ ·· ⑥
$= (BO + 1.1) \times (EL2 - EL4) - (BO \times HO)$

$5.3(EL2 - EL4)$

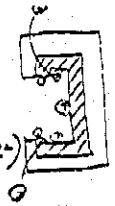


F2

$0.150 \times (EL2 - EL4) \times 2$ · ⑦.
$= 0.3 \times (EL2 - EL4)$

Outlet - 2

F2



$0.200 \times (EL2 - EL4 + 0.200) \times 2$ .. ①
$0.150 \times (EL2 - EL4 + 0.200) \times 2$ .. ②
$0.300 \times (EL2 - EL4 + 200) \times 2$ .. ③
$1.3(EL2 - EL4 + 0.2)$

$(B0 + 0.150 \times 2) \times (EL2 - EL4 + 0.200) - (B0 \times H0)$ .. ④

$= (B0 + 0.3) \times (EL2 - EL4 + 0.2) - (B0 \times H0)$

Outlet - 3

F1

$(L2 - B0 + 0.550 \times 2) \times (EL2 - EL4) \times 2$ .. ①
$= (L2 - B0 - 1.1) \times (EL2 - EL4) \times 2$
$(15 - L12 + 0.350) \times (EL2 - EL4) \times 2$ .. ②

Foundation Concrete

F1

$L2 \times 500 \times 2$

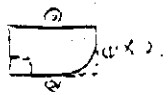
$= L2$

Revetment Type II 2 Lanes (slide gate) Long Conduit

Inlet - 1

F2

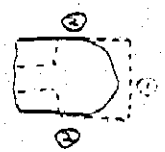
$0.400 \times (EL6 - EL5) \times 2 \cdots ①$
$= 0.8 (EL6 - EL5)$
$0.500 \times (EL6 - EL5) \times 2 \times 2 \cdots ②$
$= 2.0 (EL6 - EL5)$



Inlet - 2

F2

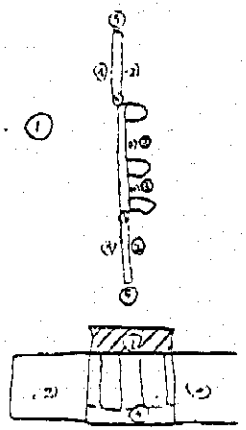
$0.600 \times (EL6 - EL5) \cdots ①$
$0.500 \times (EL6 - EL5) \cdots ②$



Inlet - 3

F2

$(EL6 - EL5 - H0) \times 0.600 + B0 \times 2 + 0.100 \times 2) \cdots ①$
$L13 \times H3 \times 2 \cdots ②$
$= (EL6 - EL5 - H0)(1.4 + B0 \times 2)$



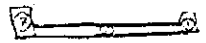
F1

$(H3 - (EL3 - EL5)) \times 0.600 + B0 \times 2 + 0.400 \times 2) \cdots ③$
$= (H3 - EL3 + E-5)(1.4 + B0 \times 2)$
$L13 \times H3 \times 2 \cdots ④$
$0.250 \times H3 \times 2 \cdots ⑤$
$= 0.5 H3$

Conduit - 1

F1

$0.550 \times (EL6 - EL5 - H0) \times 2 \cdots ①$
$= 1.1 \times (EL6 - EL5 - H0)$
$(L10 - 0.550 - 0.500) \times t2 \times 2 \cdots ②$
$= (L10 - 1.05) \times t2 \times 2$
$500 \times (EL2 - EL4 - H0) \times 2 \cdots ③$
$= EL2 - EL4 - H0$



Conduit - 2

F2

$L10 \times H0 \times 2 \times 2 \cdots ①$
$L10 \times B0 \times 2 \cdots ②$

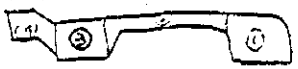
F1

$L10 \times H0 \times 2 \cdots ①$

Conduit - 3

F1

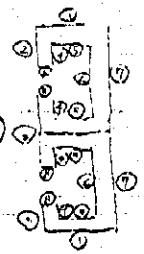
$0.900 \times (H3 - (EL3 - EL5)) \times 2 \cdots ①$
$= 1.8 \times (H3 - EL3 + EL5)$
$(L11 - L12 - 0.100) \times t3 \times 2 \cdots ②$
$1.400 \times (H1 - (EL2 - EL4)) \times 2 \cdots ③$
$= 2.8 (H1 - EL2 + EL4)$
$(L12 - 1.400) \times (H1 - (EL2 - EL1)) \times 2 \cdots ④$



Outlet - 1

F1

1.150 × (EL2 - EL4) × 2 ··· ①
0.550 × (EL2 - EL4) × 2 ··· ②
} 3.4 × (EL2 - EL4)



6.250 × 2 + t4) × (EL2 - EL4) ··· ③
= (0.5 + t4) × (EL2 - EL4)
0.250 × (EL2 - EL4) × 2 × 2 ··· ④
= EL2 - EL4
0.700 × (EL2 - EL4) × 2 × 2 ··· ⑤
} 3.8 × (EL2 - EL4)
= 2.8 (EL2 - EL4)
((B0 + 0.250 × 2) × (EL2 - EL4) - (B0 × H0)) × 2 ··· ⑥
{(B0 + 0.5) × (EL2 - EL4) - B0H0} × 2
((B0 + 0.550 × 2) × (EL2 - EL4)) × 2 ··· ⑦

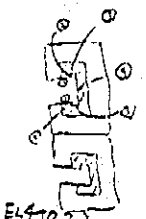
F2

0.150 × (EL2 - EL4) × 2 × 2 ··· ⑧
= 0.6 × (EL2 - EL4)

Outlet - 2

F2

0.200 × (EL2 - EL4 + 0.200) × 2 × 2 ··· ①
0.150 × (EL2 - EL4 + 0.200) × 2 × 2 ··· ②
0.300 × (EL2 - EL4 + 0.200) × 2 × 2 ··· ③
} 2.6 (EL2 - EL4 + 0.2)

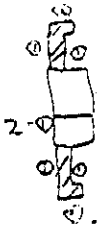


((B0 + 0.150 × 2) × (EL2 - EL4 + 0.200) - (B0 × H0)) × 2 ··· ④
= {(B0 + 0.3) × (EL2 - EL4 + 0.2) - (B0 × H0)} × 2

Outlet - 3

F1

(L2 - B0 × 2 - 550 × 2 - t4) × (EL2 - EL4) × 2
= L2 - B0 × 2 - 1.1 - t4) × (EL2 - EL4) × 2
(L4 - L9 + 0.350) × (EL2 - EL4) × 2
=



Foundation Concrete

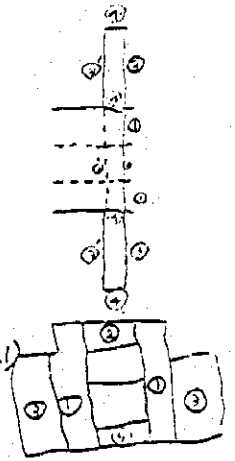
F1

L2 × 0.500 × 2 = L2.

SW-83

Revetment Type II 1 Lane (Slide gate) Short Conduit.

Inlet.



F2

$0.550 \times (EL2-EL4) \times 2 \cdots ①$
$= 1.1 (EL2-EL4)$

$0.200 \times B0 \cdots ②$

$H3 \times (L4 - B0 - 0.550 \times 2) \cdots ③$
$= H3 (L4 - B0 - 1.1)$

F1

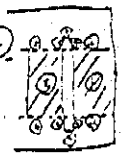
$0.200 \times B0 \cdots ②'$

$H3 \times (L4 - B0 - 0.550 \times 2) \cdots ③'$
$= H3 \times (L4 - B0 - 1.1)$

$0.250 \times H3 \times 2 \cdots ④$
$= 0.5\, H3$

$(H3 - (EL3 - EL4)) \times B0 \cdots ⑤$
$= (H3 - EL3 + EL4) \times B0$

Conduit-1



F2

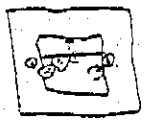
$(1.000 - 0.300 - L16) \times B0 \cdots ①$
$= (0.7 - L16) \times B0$

$(t1 + H0 - 0.200) \times (1.000 - 0.300 - L16) \times 2 \cdots ②$
$= (t1 + H0 - 0.2) \times (0.7 - L16) \times 2$

$(t1 + H0) \times L16 \times 2 \cdots ③$

$(t1 + H0) \times L16 \times 2 \times 2 \cdots ④$

$0.300 \times B0 \cdots ⑤$



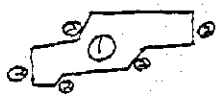
$(t1 + H0) \times 0.300 \times 2 \cdots ⑥$
$= (t1 + H0) \times 0.6$

Conduit-2

F1

$L12 \times 0.800 \times 2 \cdots ①$
$= 1.6 \times L12$

$0.800 \times (B0 + 0.550 \times 2) \times 2 \cdots ②$
$= 1.6 \times (B0 + 1.1)$



Outlet-1

F1

$0.850 \times (EL2-EL4) \times 2 \cdots ①$
$= 1.7 \times (EL2-EL4)$

$(0.300 + 0.250) \times (EL2-EL4) \times 2 \cdots ②$
$= 1.1 (EL2-EL4)$

$0.250 \times (EL2-EL4) \times 2 \cdots ③$
$= 0.5 (EL2-EL4)$

$0.700 \times (EL2-EL4) \times 2 \cdots ④$
$= 1.4 (EL2-EL4)$

$(B0 + 0.250 \times 2) \times (EL2-EL4) - (B0 \times H0) \cdots ⑤$

$\Big\} 4.7 (EL2-EL4)$

F2

$0.150 \times (EL2-EL4) \times 2 \cdots ⑥$
$= 0.3 \times (EL2-EL4)$

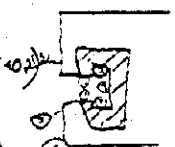
Outlet-2

F2

$0.200 \times (EL2-EL4+0.200) \times 2 \cdots ①$
$0.150 \times (EL2-EL4+0.200) \times 2 \cdots ②$
$0.300 \times (EL2-EL4+0.200) \times 2 \cdots ③$

$\Big\} 1.3 (EL2-EL4+0.2)$

$(B0 + 0.150 \times 2) \times (EL2-EL4+0.200) - (B0 \times H0) \cdots ④$

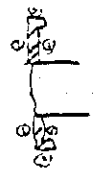


Outlet-3

F1

$(L2 - B0 - 0.550 \times 2) \times (EL2-EL4) \times 2 \cdots ①$

$(L5 - L11 + 0.350) \times (EL2-EL4) \times 2 \cdots ②$



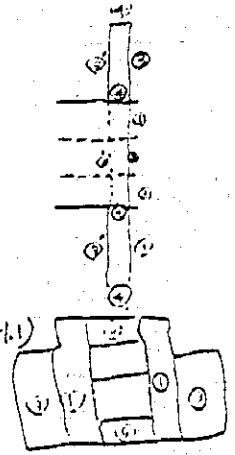
Foundation Concrete

F1

$L2 \times 0.500 \times 2$
$= L2$

Revetment Type II (1 Lane (Slide gate) Short Conduit - 2

Special case (SKM-3L)



Inlet.

F2

$0.550 \times (EL2-EL4) \times 2 \cdots ①$
$= 1.1\,(EL2-EL4)$

$0.200 \times B0 \cdots ②$

$H3 \times (L4 - B0 - 0.550 \times 2) \cdots ③$
$= H3\,(L4 - B0 \times 1.1)$

F1

$0.200 \times B0 \cdots ②'$

$H3 \times (L4 - B0 - 0.550 \times 2) \cdots ③'$ $= H3 \times (L4 - B0 - 1.1)$

$0.250 \times H3 \times 2 \cdots ④$ $= 0.5 \times H3$

$(H3 - (EL3 - EL4)) \times B0 \cdots ⑤$
$= (H3 - EL3 + EL4)\,B0$

Conduit - 1

F2

$(1000 - 0.300 - L16) \times B0 \cdots ①$
$= (0.7 - L16) \times B0$

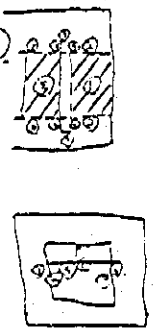
$(t1 + H0 - 0.200) \times (1000 - 0.200 - L16) \times 2 \cdots ②$
$= (t1 + H0 - 0.2) \times (0.7 - L16) \times 2$

$(t1 + H0) \times \quad 2 \cdots ③$

$(t1 + H0) \times \quad 2 \times 2 \cdots ④$

$0.300 \times B0 \cdots ⑤$

$(t1 + H0) \times 0.300 \times 2 \cdots ⑥$
$= (t1 + H0) \times 0.6$

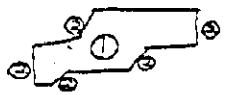


Conduit - 2

F1

$L12 \times 0.800 \times 2 \cdots ①$
$= 1.6 \times L12$

$0.800 \times (B0 + 0.550 \times 2) \times 2 \cdots ②$
$= 1.6\,(B0 + 1.1)$



Outlet - 1

F1

$0.850 \times (EL2-EL4) \times 2 \cdots ①$
$= 1.7 \times (EL2-EL4)$

$(0.300 + 0.250) \times (EL2-EL4) \times 2 \cdots ②$
$= 1.1 \times (EL2-EL4)$

$0.250 \times (EL2-EL4) \times 2 \cdots ③$
$= 0.5 \times (EL2-EL4)$

$0.700 \times (EL2-EL4) \times 2 \cdots ④$
$= 1.4 \times (EL2-EL4)$

$(B0 + 0.250 \times 2) \times (EL2-EL4) - (B0 \times H0) \cdots ⑤$

$= 4.7\,(EL2-EL4)$

F2

$0.150 \times (EL2-EL4) \times 2 \cdots ⑥$
$= 0.3\,(EL2-EL4)$

Outlet - 2

F2

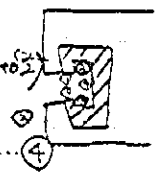
$0.200 \times (EL2-EL4+0.200) \times 2 \cdots ①$

$0.150 \times (EL2-EL4+0.200) \times 2 \cdots ②$

$0.300 \times (EL2-EL4+0.200) \times 2 \cdots ③$

$= 1.3\,(EL2-EL4+0.2)$

$(B0 + 0.150 \times 2) \times (EL2-EL4+0.200) - (B0 \times H0) \cdots ④$

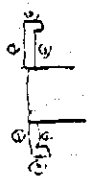


Outlet - 3

F1

$(L2 - B0 - 0.550 \times 2) \times (EL2-EL4) \times 2 \cdots ①$

$(L5 - L11 + 0.350) \times (EL2-EL4) \times 2 \cdots ②$



Foundation Concrete

$L2 \times 0.500 \times 2$
$= L2$

Revetment Type II 1 Lane (Flap gate) Short Conduit

Inlet

F2

$0.450 \times (EL2 - EL4) \times 2 \cdots ①$
$= 0.9(EL2 - EL4)$

$0.200 \times B0 \cdots ②$

$H3 \times (L4 - B0 - 0.450 \times 2) \cdots ③$

F1

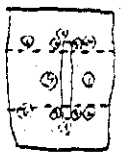
$0.200 \times B0 \cdots ②'$

$H3 \times (L4 - B0 - 0.450 \times 2) \cdots ③'$

$0.250 \times H3 \times 2 \cdots ④$
$= 0.5H3$

$(H3 - (EL3 - EL4)) \times B0 \cdots ⑤$

Conduit - 1



F2

$(1.000 - 0.300 - L18) \times B0 \cdots ①$
$= (0.7 - L18) \times B0$

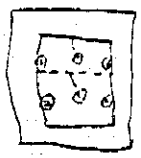
$(t1 + H0 - 0.200) \times (1.000 - 0.300 - L18) \times 2 \cdots ②$
$= (t1 + H0 - 0.2) \times (0.7 - L18) \times 2$

$(t1 + H0) \times L18 \times 2 \cdots ③$

$(t1 + H0) \times L18 \times 2 \times 2 \cdots ④$

$0.300 \times B0 \cdots ⑤$

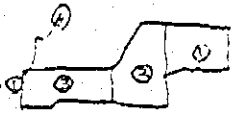
$(t1 + H0) \times 0.300 \times 2 \cdots ⑥$



Conduit - 2

F1

$(L12 - L14) \times (H3 - (EL3 - EL4)) \times 2 \cdots ①$

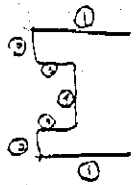


$((EL4 - EL1) \times 0.5 + 0.300) \times (H1 - (EL2 - EL4)) \times 2 \cdots ②$

$(L14 - ((EL4 - EL1) \times 0.5 + 0.300)) \times 0.400 \times 2 \cdots ③$
$= 0.8 \{L14 - \{(EL4 - EL1) \times 0.5 + 0.3\}\}$

$0.400 \times (B0 + 0.450 \times 2) \cdots ④$
$= 0.4 \times (B0 + 0.9)$

Outlet - 1



F1

$0.500 \times (EL2 - EL4) \times 2 \cdots ①$
$= EL2 - EL4$

$0.300 \times (EL2 - EL4) \times 2 \cdots ②$
$= 0.6(EL2 - EL4)$

$(B0 + 0.150 \times 2) \times (EL2 - EL4) - (B0 \times H0) \cdots ④$

F2

$0.500 \times (EL2 - EL4) \times 2 \cdots ③$
$= EL2 - EL4$

Outlet - 2

F2

$(B0 + 0.150 \times 2) \times (EL2 - EL4 + 0.200) - (B0 \times H0) \cdots ①$

Outlet -3

F1

$(L2 - B0 - 0.450 \times 2) \times H1 \times 2$ ... ①

$(L5 - 1.11 + 0.350) \times H1 \times 2$ ... ②

Foundation Concrete

$L2 \times 0.700 \times 2 = L2$

Open Culvert / Concrete Ditch (Slide gate) Short Conduit

Inlet

F2

$0.550 \times (EL2 - EL4 - 0.200) \times 2 \cdots ①$

$0.200 \times (B0 + 0.550 \times 2) \cdots ②$ $= 1.1 \times (EL2 - EL4 - 0.2)$

$L10 \times H4 \times 2 \cdots ④$ $= 0.2 (B0 + 1.1)$

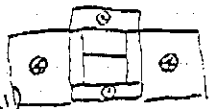
F1

$(H4 - (EL3 - EL4)) \times (B0 + 0.550 \times 2) \cdots ③$

$L10 \times H4 \times 2 \cdots ⑤$ $= (H4 - EL3 + EL4) \times (B0 + 1.1)$

$0.250 \times H4 \times 2 \cdots ⑥$

$-0.5H4$



Conduit - 1

F2

$(2.000 - 1.300 - L11) \times B0 \cdots ①$

$= (0.7 - L11) \times B0$

$(t1 + H0 - 0.200) \times (2.000 - 1.300 - L11) \times 2 \cdots ②$

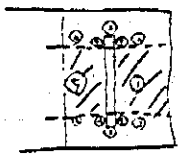
$= (t1 + H0 - 0.2) \times (0.7 - L11) \times 2$

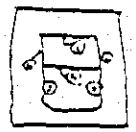
$(t1 + H0) \times L11 \times 2 \cdots ③$

$(t1 + H0) \times L11 \times 2 \times 2 \cdots ④$

$0.300 \times B0 \cdots ⑤$

$(t1 + H0) \times 0.300 \times 2 \cdots ⑥$





Conduit - 2

F1

$(H4 - (EL3 - EL4)) \times 1.200 \times 2 \cdots ①$

$(0.300 + H2) \times (1.000 - 2.00) \times 2 \cdots ②$

$= (0.3 + H2) \times 1.6$

Outlet - 1

F1

$1.000 \times (EL2 - EL4) \times 2 \cdots ①$

$(0.300 + 0.250) \times (EL2 - EL4) \times 2 \cdots ②$ $= 2.0 \times (EL2 - EL4)$

$0.250 \times (EL2 - EL4) \times 2 \cdots ③$ $= 1.1 (EL2 - EL4)$

$0.700 \times (EL2 - EL4) \times 2 \cdots ④$ $= (EL2 - EL4)$

$(B0 + 0.250 \times 2) \times (EL2 - EL4) - (B0 \times H0) \cdots ⑤$ $= 1.4 (EL2 - EL4)$

F2

$0.300 \times (EL2 - EL4) \times 2 \cdots ⑥$

$= 0.6 \times (EL2 - EL4)$

Outlet - 2

F2

$0.200 \times (EL2 - EL4) \times 2 \cdots ①$

$= 0.4 \times (EL2 - EL4)$

$0.150 \times (EL2 - EL4) \times 2 \cdots ②$

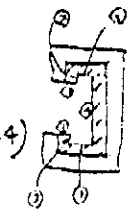
$= 0.3 \times (EL2 - EL4)$

$0.300 \times (EL2 - EL4) \times 2 \cdots ③$

$= 0.6 \times (EL2 - EL4)$

$(B0 \times 0.250 \times 2) \times (EL2 - EL4) - (B0 \times H0) \cdots ④$

$1.3 (EL2 - EL4)$



SW-89

Open Culvert / Concrete Ditch (Flap gate)

Short Conduit

Inlet

F2

0.550 × (EL2 - EL4 + 0.200) × 2 ··· ①

0.200 × (B0 + 0.550 × 2) = 1.1 (EL2 - EL4 - 0.2) ··· ②

L9 × H3 × 2 = 0.2 × (B0 + 1.1) ··· ③

F1

(H3 - (EL3 - EL4)) × (B0 + 0.550 × 2) ··· ③

L9 × H3 × 2 ··· ④

0.250 × H3 × 2 = 0.5 H3 ··· ⑤

Conduit - 1

F2

(2.000 - 1.300 - L10) × B0 = (0.7 - L10) × B0 ··· ①

(t1 + H0 + 0.200) × (2.000 - 1.300 - L10) × 2 = (t1 + H0 - 0.2) × (0.7 - L10) × 2 ··· ②

(t1 + H0) × L10 × 2 ··· ③

(t1 + H0) × L10 × 2 × 2 ··· ④

0.300 × B0 ··· ⑤

(t1 + H0) × 0.300 × 2 ··· ⑥

Conduit - 2

F1

(1.000 - 0.800) × 0.400 × 2 = 0.56 ··· ①

1.100 × (EL4 - EL1) × 2 = 2.2 (EL4 - EL1) ··· ②

Outlet - 1

F1

0.500 × (EL2 - EL4) × 2 ··· ①

0.300 × (EL2 - EL4) × 2 ··· ② } 1.6 (EL2 - EL4)

(B0 + 0.150 × 2) × (EL2 - EL4) - (B0 × H0) ··· ④

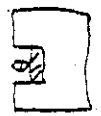
F2

0.500 × (EL2 - EL4) × 2 = EL2 - EL4 ··· ③

Outlet - 2

F2

(B0 + 0.150 × 2) × (EL2 - EL4 + 0.200) - (B0 × H0) ··· ①



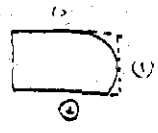
Concrete L-Type Wall 1 Lane (slide) Long Conduit

Inlet

F2

$0.400 \times (EL6-EL5) \times 2$ ... ① $= 0.8(EL6-EL5)$

$0.500 \times (EL6-EL5) \times 2 \times 2$ ... ② $= 2.0 \times (EL6-EL5)$



Partition Wall

F1

$(L4 + 0.500) \times 0.500 \times 2 \times 2$ ... ① $= 2.0 \times (L4 + 0.5)$

$((L6 + 2.300) \times 2) \times 0.500 \times 2$ ... ② $= (L6 + 2.3) \times 2$

$0.500 \times 0.300 \times 2$ ... ③ $= 0.3$

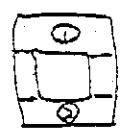
Conduit - 1

F2

$(EL6-EL5-H0) \times (B0 + 0.400 \times 2)$ ... ①

F1

$(H3-(EL6-EL5)) \times (B0 + 0.400 \times 2)$ ... ②



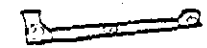
Conduit - 2

F1

$0.550 \times (EL6-EL5-H0) \times 2$ ... ① $= 1.1 \times (EL6-EL5-H0)$

$(L7 - 0.550 - 0.500) \times t2 \times 2$ ... ② $= (L7 - 1.05) \times t2 \times 2$

$0.500 \times (EL2-EL4-H0) \times 2$ ... ③ $= EL2 - EL4 + H0$



Conduit - 3

F2

$L7 \times H0 \times 2$ ... ①

$L7 \times B0$ ... ②

F1

$L7 \times H0 \times 2$ ... ①

Conduit - 4

F1

$(0.500 + 0.550) \times (H3-(EL6-EL5)) \times 2$ ... ① $= 2.1 \times (H3 - EL6 + EL5)$

$(L8 - 1.050) \times t3 \times 2$ ... ②

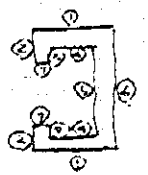
$1.300 \times 7.00 \times 2$ ... ③ $= 1.82$

Outlet -1

F1

$1.300 \times (EL2 - EL4) \times 2 \cdots ①$
$= 2.6 \times (EL2 - EL4)$
$0.550 \times (EL2 - EL4) \times 2 \cdots ②$
$= 1.1 \times (EL2 - EL4)$
$0.250 \times (EL2 - EL4) \times 2 \cdots ③$
$= 0.5 \times (EL2 - EL4$
$0.700 \times (EL2 - EL4) \times 2 \cdots ④$
$= 1.4 \times (EL2 - EL4)$

$= 5.6 \times (EL2 - EL4)$



$(B0 + 0.250 \times 2) \times (EL2 - EL4) - (B0 \times H0) \cdots ⑤$

$(B0 + 0.550 \times 2) \times (EL2 - EL4) - (B0 \times H0) \cdots ⑥$

F2

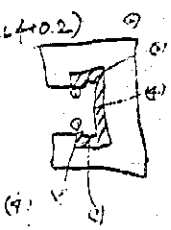
$0.150 \times (EL2 - EL4) \times 2 \cdots ⑦$

Outlet -2

F2

$0.200 \times (EL2 - EL4 + 0.200) \times 2 \cdots ①$
$= 0.4 \times (EL2 - EL4 + 0.2)$
$0.150 \times (EL2 - EL4 + 0.200) \times 2 \cdots ②$
$= 0.3 \times (EL2 - EL4 + 0.2)$
$0.300 \times (EL2 - EL4 + 0.200) \times 2 \cdots ③$
$= 0.6 \times (EL2 - EL4 + 0.2)$

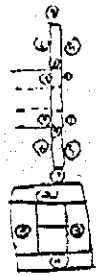
$= 1.3 (EL2 - EL4 + 0.2)$



$(B0 + 0.150 \times 2) \times (EL2 - EL4 + 0.200) - (B0 \times H0) \cdots ④$

Concrete L-Type Wall 1 Lane (slide gate) Short Conduit.

Inlet



F2

$0.550 \times (EL2 - EL4 - 0.200) \times 2 \cdots ①$

$0.200 \times (B0 + 0.550 \times 2) \cdots ②$

$L9 \times H3 \times 2 \cdots ⑤$

F1

$0.550 \times (EL2 - EL4 - 0.200) \times 2 \cdots ③$

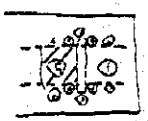
$(B0 + 0.550 \times 2) \times 0.400 \cdots ④$

$0.250 \times H3 \times 2 \cdots ⑦$

$L9 \times H3 \times 2 \cdots ⑥$

Conduit - 1

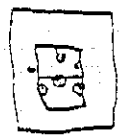
F2



$(2.000 - 1.300 - L10) \times B0 \cdots ①$
$= (0.7 - L10) \times B0$

$(t1 + H0 - 0.200) \times (2.000 - 1.300 - L10) \times 2 \cdots ②$
$= (t1 + H0 - 0.2) \times (0.7 - L10) \times 2$

$(t1 + H0) \times L10 \times 2 \cdots ③$



$(t1 + H0) \times L10 \times 2 \times 2 \cdots ④$

$0.300 \times B0 \cdots ⑤$

$(t1 + H0) \times 0.300 \times 2 \cdots ⑥$

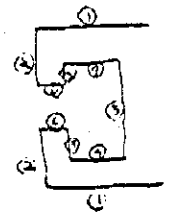
Conduit - 2

F1

$1.600 \times 0.700 \times 2 \cdots ①$ 2.24

$0.500 \times 0.700 \times 2 \cdots ②$ 0.7

Outlet - 1



F1

$(0.700 + 0.300) \times (EL2 - EL4) \times 2 \cdots ①$
$= 2.0 (EL2 - EL4)$

$(0.300 + 0.250) \times (EL2 - EL4) \times 2 \cdots ②$
$= 1.1 (EL2 - EL4)$

$0.250 \times (EL2 - EL4) \times 2 \cdots ③$
$= 0.5 (EL2 - EL4)$

$0.700 \times (EL2 - EL4) \times 2 \cdots ④$
$= 1.4 (EL2 - EL4)$

$= 5.0 \times (EL2 - EL4)$

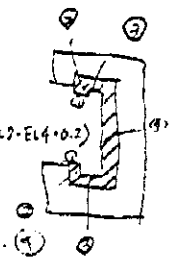
$(B0 + 0.250 \times 2) \times (EL2 - EL4) - (B0 \times H0) \cdots ⑤$

F2

$0.150 \times (EL2 - EL4) \times 2 \cdots ⑥$

Outlet - 2

F2



$0.200 \times (EL2 - EL4 + 0.200) \times 2 \cdots ①$
$= 0.4 \times (EL2 - EL4 + 0.2)$

$0.150 \times (EL2 - EL4 + 0.200) \times 2 \cdots ②$
$= 0.3 (EL2 - EL4 + 0.2)$

$0.300 \times (EL2 - EL4 + 0.200) \times 2 \cdots ③$
$= 0.6 \times (EL2 - EL4 + 0.2)$

$= 1.3 \times (EL2 - EL4 + 0.2)$

$(B0 + 0.150 \times 2) \times (EL2 - EL4 + 0.200) - (B0 \times H0) \cdots ④$

SW-92

Concrete L-Type Wall 2 Lanes (Slide gate) Short

Inlet

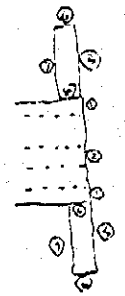
F2

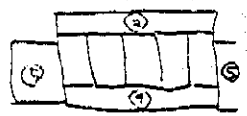
0.550 × (EL2 − EL4 − 0.200) × 2 ··· ①

0.800 × (EL2 − EL4 − 0.200) ··· ②

0.200 × (0.800 + B0 × 2 + 0.550 × 2) ··· ③

L9 × H3 × 2 ··· ⑤





F1

0.400 × (0.800 + B0 × 2 + 0.550 × 2) ··· ④

0.250 × H3 × 2 ··· ⑥ = 0.5 × H3

L9 × H3 × 2 ··· ⑦

Conduit - 1

F2

(2000 − 1300 − L10) × B0 × 2 ··· ①

= (0.7 − L10) × B0 × 2

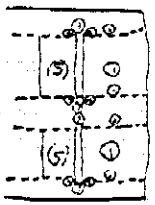
(t1 + H0 − 0.200) × (2000 − 1300 − L10) × 2 × 2 ··· ②

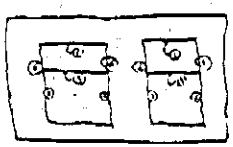
(t1 + H0) × L10 × 2 × 2 ··· ③

(t1 + H0) × L10 × 2 × 2 × 2 ··· ④

0.300 × B0 ··· ⑤

(t1 + H0) × 0.300 × 2 × 2 ··· ⑥





Conduit - 2

F1

0.1600 × 0.700 × 2 ··· ① 2.24

0.500 × 0.700 × 2 ··· ② 0.7

Outlet - 1

F1

(0.700 + 0.300) × (EL2 − EL4) × 2 ··· ①

= (EL2 − EL4) × 2

(0.300 + 0.250) × (EL2 − EL4) × 2 ··· ②

= 0.55 × (EL2 − EL4) × 2

0.800 × (EL2 − EL4) ··· ③

= 0.8 × (EL2 − EL4)

0.250 × (EL2 − EL4) × 2 × 2 ··· ④

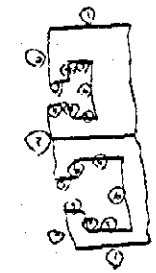
= 0.5 × (EL2 − EL4) × 2

0.700 × (EL2 − EL4) × 2 × 2 ··· ⑤

= 1.4 × (EL2 − EL4) × 2

((B0 + 0.250 × 2) × (EL2 − EL4) − (B0 × H0)) × 2 ··· ⑥

7.7 × (EL2 − EL4)

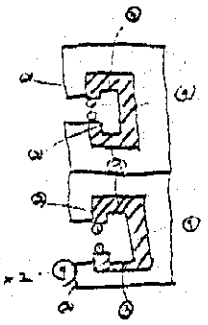


F2

0.300 × (EL2 − EL4) × 2 × 2 ··· ⑦

Outlet - 2

F2



$0.200 \times (EL2-EL4+0.200) \times 2 \times 2 \cdots ①$
$= 0.2 \times (EL2-EL4+0.2)$

$0.150 \times (EL2-EL4+0.200) \times 2 \times 2 \cdots ②$
$= 0.6 \times (EL2-EL4+0.2)$

$0.300 \times (EL2-EL4+0.200) \times 2 \times 2 \cdots ③$
$= 1.2 \times (EL2-EL4+0.2)$

$((B0+150\times2) \times (EL2-EL4+200) - (B0 \times H0)) \times 2 \cdots ④$

$① - ② - ③ = 2.6\,(EL2-EL4+0.2)$

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Concrete L-Type Wall 1 Lane (Flap gate)

Inlet

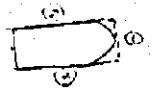
F2

$0.400 \times (EL6-EL5) \times 2 \cdots ①$

$= 0.8 \times (EL6-EL5)$

$0.500 \times (EL6-EL5) \times 2 \times 2 \cdots ②$

$= 2.0 \times (EL6-EL5)$



Partition Wall

F1

$(L4 \not\!\!\!

Outlet - 2

F2

$(BO\ y_1\ 150 \times 2) \times (EL2 - EL4\ y_2\ 200) - (Bo \times Ho)$ .. ①

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Table QUANTITIY CALCULATION OF FORM WORK

Package 1 No.3.1/19, 20

Sluiceway No. : SKM-1L Location : KM20+16m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.2 m : Height 1.2 m

Length : 13.656 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		1.39
2		3.46
Conduit 1		
1	8.42	
2	1.20	
3		1.06
4	0.96	
5	0.90	
6	0.71	
Conduit 2		
1	0.53	
2	4.94	
3	0.78	
Conduit 3		
1	26.21	
2	13.11	
3		26.21
Conduit 4		
1	0.90	
2	29.65	
3	4.46	
Outlet 1		
1		
2		
3		
4	9.53	
5	3.25	
6	2.96	
7		0.57
Outlet 2		
1		
2		
3		2.75
4		1.73
Outlet 3		
1	15.30	
2	2.37	
Foundation concrete		
1	6.30	
Total	132.47	37.17

Table QUANTITIY CALCULATION OF FORM WORK

Package 1 No.3.1/19, 20

Sluiceway No. : SKM-2L Location : KM24+35m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.1 m : Height 1.1 m

Length : 9.407 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		1.24
2		3.11
Conduit 1		
1	12.62	
2	1.46	
3		0.86
4	0.88	
5	0.86	
6	0.67	
Conduit 2		
1	0.45	
2	2.81	
3	0.90	
Conduit 3		
1	14.66	
2	7.33	
3		14.66
Conduit 4		
1	0.90	
2	20.52	
3	4.47	
Outlet 1		
1		
2		
3		
4	9.55	
5	3.06	
6	3.00	
7		0.57
Outlet 2		
1		
2		
3		2.75
4		1.75
Outlet 3		
1	15.31	
2	2.35	
Foundation concrete		
1	6.20	
Total	108.00	24.95

Table QUANTITIY CALCULATION OF FORM WORK

Package 1 No.3.1/19, 20

Sluiceway No. : SKM-3L Location : KM26+2m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.5 m : Height 1.3 m

Length : 4.091 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		2.11
2	0.30	0.30
3	6.87	6.87
4	0.82	
5	0.60	
Conduit -1		
1		0.83
2		1.89
3		0.57
4		1.15
5		0.45
6		1.15
Conduit-2		
1	6.55	
2	4.16	
Outlet - 1		
1		
2		
3		
4	9.00	
5	1.88	
6		0.57
Outlet - 2		
1		
2		
3		6.35
4		1.86
Outlet - 3		
1	15.32	
2	-0.89	
Foundation concrete		
1	6.60	
Total	51.20	24.08

Table QUANTITIY CALCULATION OF FORM WORK

Package 1 No.3.1/19, 20

Sluiceway No. : SKM-4L Location : KM29+19m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 0.8 m : Height 0.8 m

Length : 7.809 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		1.15
2		2.87
Partition wall (Inlet)		
1	6.91	
2	8.62	
3	0.30	
Conduit 1		
1	2.93	
2	0.63	
3	1.63	
Conduit 2		
1	2.12	
Conduit 3		
1	1.03	
2	0.76	
3	0.54	
Conduit 4		
1	8.49	
2	2.00	
3	1.30	
4	2.68	
5	1.77	
6		10.09
7		5.05
Conduit 5		
1	2.80	
2	1.85	
3	2.12	
4	1.50	
5	2.68	
Partition wall (Outlet)		
1	11.85	
2	9.47	
3	0.30	
Outlet 1		
1	4.97	
2	2.10	
3		1.15
4	0.99	
5	2.64	
Outlet 2		
1		
2		
3		2.75
4		1.68
Outlet 3		
1	8.47	
2	1.67	
3	14.45	
Foundation concrete		
1	5.68	
2	1.52	
3	3.41	
Total	125.20	24.73

Table QUANTITIY CALCULATION OF FORM WORK

Package 1 No.3.1/19, 20

Sluiceway No. : SKM-5L Location : KM31+56m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.0 m : Height 1.0 m

Length : 7.824 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		1.22
2		3.05
Partition wall (Inlet)		
1	6.24	
2	8.80	
3	0.30	
Conduit 1		
1	2.52	
2	0.53	
3	1.70	
Conduit 2		
1	2.66	
Conduit 3		
1	0.83	
2	0.84	
3	0.59	
Conduit 4		
1	10.65	
2	7.32	
3	1.36	
4	2.75	
5	1.74	
6		12.65
7		6.32
Conduit 5		
1	2.80	
2	1.92	
3	2.13	
4	1.50	
5	2.75	
Partition wall (Outlet)		
1	11.75	
2	9.40	
3	0.30	
Outlet 1		
1	4.91	
2	2.08	
3		1.13
4	0.99	
5	2.64	
Outlet 2		
1		
2		
3		2.71
4		1.71
Outlet 3		
1	8.21	
2	1.64	
3	13.96	
Foundation concrete		
1	5.75	
2	1.54	
3	3.45	
Total	126.51	28.80

Table QUANTITIY CALCULATION OF FORM WORK

Package 1 No.3.1/19, 20

Sluiceway No. : SKM-6L Location : KM38+3m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.0 m : Height 1.0 m

Length : 7.200 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		0.93
2		2.33
3	0.93	
Partition wall (Inlet)		
1	5.69	
2	8.08	
3	0.30	
Conduit 1		
1	0.30	
2	0.08	
3	0.64	
Conduit 2		
1	2.35	
Conduit 3		
1	0.77	
2	0.76	
3	0.54	
Conduit 4		
1	11.40	
2	0.84	
3	1.02	
4	2.39	
5	2.02	
6		11.40
7		5.70
Conduit 5		
1	0.80	
2	2.19	
3	1.88	
4	1.50	
5	2.75	
Outlet 1		
1	4.74	
2	2.01	
3		1.09
4	0.91	
5	2.55	
Outlet 2		
1		
2		
3		2.63
4		1.63
Parapet wall		
1	49.40	
2	1.42	
Foundation concrete		
1	5.50	
Total	113.77	25.72

Table QUANTITIY CALCULATION OF FORM WORK

Package 1 No.3.1/19, 20

Sluiceway No. : SKM-7L Location : KM42+7m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 0.7 m : Height 0.7 m

Length : 7.200 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		0.54
2		1.34
3	0.54	
Partition wall (Inlet)		
1	4.98	
2	7.19	
3	0.30	
Conduit 1		
1	-0.05	
2	-0.02	
3	0.53	
Conduit 2		
1	1.88	
Conduit 3		
1	0.77	
2	0.64	
3	0.45	
Conduit 4		
1	7.98	
2	0.91	
3	0.81	
4	2.57	
5	1.98	
6		7.98
7		3.99
Conduit 5		
1	0.80	
2	2.08	
3	1.88	
4	1.50	
5	2.74	
Outlet 1		
1	4.03	
2	1.71	
3		0.93
4	0.78	
5	2.17	
Outlet 2		
1		
2		
3		2.28
4		1.26
Parapet wall		
1	49.32	
2	1.40	
Foundation concrete		
1	5.49	
Total	105.36	18.31

Table QUANTITIY CALCULATION OF FORM WORK

Package 1 No.3.1/19, 20

Sluiceway No. : SKM-8L Location : KM46+35m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.0 m : Height 1.0 m

Length : 7.926 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		1.19
2		2.98
Partition wall (Inlet)		
1	5.84	
2	8.53	
3	0.30	
Conduit 1		
1	2.21	
2	0.49	
3	1.60	
Conduit 2		
1	2.71	
Conduit 3		
1	0.69	
2	0.84	
3	0.59	
Conduit 4		
1	10.85	
2	6.66	
3	1.33	
4	2.58	
5	1.58	
6		12.85
7		6.43
Conduit 5		
1	2.80	
2	1.81	
3	2.17	
4	1.50	
5	2.56	
Partition wall (Outlet)		
1	11.21	
2	9.03	
3	0.30	
Outlet 1		
1	4.56	
2	1.93	
3		1.05
4	0.88	
5	2.45	
Outlet 2		
1		
2		
3		2.54
4		1.54
Outlet 3		
1	6.77	
2	1.49	
3	11.29	
Foundation concrete		
1	5.56	
2	1.49	
3	3.34	
Total	117.95	28.57

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Table QUANTITIY CALCULATION OF FORM WORK

Package 1 No.3.1/19, 20

Sluiceway No. : SKM-1R Location : KM17-20m

Nos.of lane : 2 Gate type : Slide Gate

Conduit size : Width 1.1 m : Height 1.1 m

Length : 5.862 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		1.34
2		3.34
Inlet 2		
1		1.00
2		1.67
Partition wall (Inlet)		
1	7.19	
2	10.69	
3	0.30	
Conduit 1		
1	3.83	
2	0.57	
3	2.37	
Conduit 2		
1	1.68	
Conduit 3		
1	0.77	
2	1.68	
3	1.16	
Conduit 4		
1	3.88	
2		7.75
3	3.31	
4	2.17	
5		3.13
6		2.05
7		3.52
8		2.02
9	9.29	
10	10.90	
Conduit 5		
1	0.80	
2	13.38	
3	2.02	
4	1.50	
5	3.75	
Partition wall (Outlet)		
1	11.84	
2	9.41	
3	0.30	
Outlet 1		
1	4.97	
2	2.10	
3	1.53	
4		2.29
5	1.91	
6	5.35	
Outlet 2		
1		
2		
3		5.39
4		0.53
Outlet 3		
1	8.64	
2	1.64	
3	17.28	
Foundation concrete		
1	6.75	
2	1.91	
3	4.05	
Total	158.76	34.13

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Table QUANTITIY CALCULATION OF FORM WORK

Package 1 No.3.1/19, 20

Sluiceway No. : SKM-2R Location : KM21+6m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.2 m : Height 1.2 m

Length : 5.831 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		1.34
2		3.35
Partition wall (Inlet)		
1	7.14	
2	9.10	
3	0.30	
Conduit 1		
1	2.43	
2	0.48	
3	1.81	
Conduit 2		
1	1.67	
Conduit 3		
1	0.68	
2	0.92	
3	0.65	
Conduit 4		
1	8.00	
2	8.10	
3	1.47	
4	2.86	
5	1.76	
6		10.40
7		5.20
Conduit 5		
1	2.80	
2	2.04	
3	1.33	
4	1.50	
5	2.87	
Partition wall (Outlet)		
1	11.85	
2	9.44	
3	0.30	
Outlet 1		
1	4.97	
2	2.10	
3		1.15
4	0.96	
5	2.68	
Outlet 2		
1		
2		
3		2.75
4		1.73
Outlet 3		
1	8.37	
2	1.66	
3	14.26	
Foundation concrete		
1	5.87	
2	1.57	
3	3.52	
Total	125.46	25.91

Table QUANTITIY CALCULATION OF FORM WORK

Package 1 No.3.1/19, 20

Sluiceway No. : SKM-3R Location : KM27+42m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.3 m ; Height 1.3 m

Length : 5.284 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		1.43
2		3.57
Partition wall (Inlet)		
1	7.50	
2	9.55	
3	0.30	
Conduit 1		
1	2.52	
2	0.48	
3	1.85	
Conduit 2		
1	1.64	
Conduit 3		
1	0.58	
2	0.96	
3	0.68	
Conduit 4		
1	8.54	
2	8.55	
3	1.54	
4	2.94	
5	1.78	
6		11.14
7		5.57
Conduit 5		
1	2.80	
2	2.09	
3	1.31	
4	1.50	
5	2.95	
Partition wall (Outlet)		
1	11.87	
2	9.50	
3	0.30	
Outlet 1		
1	4.98	
2	2.11	
3		1.15
4	0.96	
5	2.68	
Outlet 2		
1		
2		
3		2.75
4		1.70
Outlet 3		
1	8.60	
2	1.68	
3	14.69	
Foundation concrete		
1	5.95	
2	1.59	
3	3.57	
Total	126.22	27.30

Table QUANTITIY CALCULATION OF FORM WORK

Package 1 No.3.1/19, 20

Sluiceway No. : SKM-4R Location : KM40+32m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 0.8 m ; Height 0.8 m

Length : 6.352 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		1.01
2		2.52
Partition wall		
1	5.55	
2	8.47	
3	0.30	
Conduit 1		
1	9.93	
2	1.39	
3		0.73
4	0.64	
5	0.64	
6	0.57	
Conduit 2		
1	0.46	
2	1.06	
3	1.10	
Conduit 3		
1	5.91	
2	2.95	
3		5.91
Conduit 4		
1	0.80	
2	9.16	
3	4.34	
Outlet 1		
1		
2		
3		
4	8.96	
5	2.34	
6	2.79	
7		0.54
Outlet 2		
1		
2		
3		2.60
4		1.56
Outlet 3		
1	10.82	
2	2.31	
Foundation concrete		
1	4.90	
Total	85.38	14.87

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Table QUANTITIY CALCULATION OF FORM WORK

Package 1 No.3.1/19, 20

Sluiceway No.: SKM-5R Location: KM45+6m

Nos.of lane: 1 Gate type: Slide Gate

Conduit size: Width 0.8 m : Height 0.8 m

Length: 9.268 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		1.12
2		2.79
Conduit 1		
1	7.60	
2	1.14	
3		0.95
4	0.64	
5	0.64	
6	0.57	
Conduit 2		
1	0.60	
2	2.23	
3	1.06	
Conduit 3		
1	10.61	
2	5.30	
3		10.61
Conduit 4		
1	0.80	
2	15.94	
3	4.30	
Outlet 1		
1		
2		
3		
4	8.76	
5	2.30	
6	2.72	
7		0.53
Outlet 2		
1		
2		
3		2.56
4		1.52
Outlet 3		
1	14.13	
2	2.27	
Foundation concrete		
1	5.90	
Total	87.51	20.08

Table QUANTITIY CALCULATION OF FORM WORK

Package 1 No.3.1/19, 20

Sluiceway No.: SKM-6R Location: KM50+31m

Nos.of lane: 1 Gate type: Slide Gate

Conduit size: Width 0.8 m : Height 0.8 m

Length: 9.386 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		1.08
2		2.69
Conduit 1		
1	6.29	
2	1.04	
3		0.87
4	0.64	
5	0.64	
6	0.57	
Conduit 2		
1	0.54	
2	2.29	
3	1.01	
Conduit 3		
1	10.83	
2	5.42	
3		10.83
Conduit 4		
1	0.80	
2	14.93	
3	4.26	
Outlet 1		
1		
2		
3		
4	8.49	
5	2.23	
6	2.62	
7		0.51
Outlet 2		
1		
2		
3		2.49
4		1.47
Outlet 3		
1	13.72	
2	2.20	
Foundation concrete		
1	5.90	
Total	84.42	19.94

Table QUANTITIY CALCULATION OF FORM WORK

Package 1 No.3.1/19, 20

Sluiceway No. : SKM-7R Location : KM54+26m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.0 m : Height 1.0 m

Length : 8.961 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		1.22
2		3.04
Conduit 1		
1	8.24	
2	1.19	
3		0.94
4	0.80	
5	0.81	
6	0.64	
Conduit 2		
1	0.52	
2	2.65	
3	0.75	
Conduit 3		
1	12.71	
2	6.35	
3		12.71
Conduit 4		
1	0.90	
2	15.77	
3	4.25	
Outlet 1		
1		
2		
3		
4	8.33	
5	2.53	
6	2.54	
7		0.51
Outlet 2		
1		
2		
3		2.45
4		1.45
Outlet 3		
1	13.48	
2	2.15	
Foundation concrete		
1	6.10	
Total	90.72	22.31

Table QUANTITIY CALCULATION OF FORM WORK

Package 1 No.3.1/19, 20

Sluiceway No. : SKE-1L Location : KE01+5m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 0.8 m : Height 0.8 m

Length : 3.602 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		1.59
2	0.16	0.16
3	1.62	1.62
4	0.49	
5	0.32	
Conduit -1		
1		0.44
2		1.37
3		0.43
4		0.87
5		0.24
6		0.87
Conduit-2		
1	5.76	
2	3.04	
Outlet - 1		
1		
2		
3		
4	6.80	
5	1.24	
6		0.43
Outlet - 2		
1		
2		
3		4.94
4		1.17
Outlet - 3		
1	11.58	
2	0.06	
Foundation concrete		
1	5.90	
Total	36.97	14.14

SW-10f

Table QUANTITIY CALCULATION OF FORM WORK

Package 1 No.3.1/19, 20

Sluiceway No. : SKE-2L Location : KE12-32m

Nos.of lane : 1 Gate type : Flap Gate

Conduit size : Width 0.4 m : Height 0.4 m

Length : 2.658 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		0.81
2	0.08	0.08
3	2.73	2.73
4	0.46	
5	0.16	
Conduit -1		
1		0.22
2		0.77
3		0.27
4		0.54
5		0.12
6		0.54
Conduit-2		
1	0.72	
2	1.32	
3	0.90	
4	0.52	
Outlet - 1		
1	0.90	
2	0.54	
3		0.90
4	0.47	
Outlet - 2		
1		0.47
Outlet - 3		
1	16.42	
2	2.03	
Foundation concrete		
1	5.50	
Total	32.76	7.45

Table QUANTITIY CALCULATION OF FORM WORK

Package 1 No.3.1/19, 20

Sluiceway No. : SKE-3L Location : KE13+0m

Nos.of lane : 1 Gate type : Flap Gate

Conduit size : Width 0.4 m : Height 0.4 m

Length : 2.660 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		0.81
2	0.08	0.08
3	2.42	2.42
4	0.43	
5	0.16	
Conduit -1		
1		0.22
2		0.77
3		0.27
4		0.54
5		0.12
6		0.54
Conduit-2		
1	0.72	
2	1.30	
3	0.91	
4	0.52	
Outlet - 1		
1	0.90	
2	0.54	
3		0.90
4	0.47	
Outlet - 2		
1		0.47
Outlet - 3		
1	16.34	
2	2.00	
Foundation concrete		
1	5.50	
Total	32.28	7.14

SW-105

Table QUANTITIY CALCULATION OF FORM WORK

Package 1 No.3.1/19, 20

Sluiceway No. : SKE-4L Location : KE25-5m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 0.8 m ; Height 0.8 m

Length : 6.044 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		1.00
2		2.49
Partition wall		
1	5.16	
2	7.24	
3	0.30	
Conduit 1		
1	5.45	
2	0.90	
3		0.71
4	0.64	
5	0.64	
6	0.57	
Conduit 2		
1	0.44	
2	1.00	
3	0.43	
Conduit 3		
1	5.69	
2	2.85	
3		5.69
Conduit 4		
1	0.80	
2	5.61	
3	4.06	
Outlet 1		
1		
2		
3		
4	5.70	
5	1.54	
6	1.62	
7		0.36
Outlet 2		
1		
2		
3		1.80
4		0.89
Outlet 3		
1	7.13	
2	1.20	
Foundation concrete		
1	4.90	
Total	63.87	12.93

Sw-106

Table QUANTITIY CALCULATION OF FORM WORK

Package 1 No.3.1/19, 20

Sluiceway No. : SKE-5L Location : KE31-43m

Nos.of lane : 1 Gate type : Flap Gate

Conduit size : Width 0.4 m ; Height 0.4 m

Length : 1.700 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		0.77
2		0.30
3	0.60	
4		1.62
5	1.62	
6	0.44	
Conduit - 1		
1		0.22
2		0.77
3		0.27
4		0.54
5		0.12
6		0.54
Conduit - 2		
1	0.56	
2	1.04	
Outlet - 1		
1		
2	1.44	
3		0.90
4	0.47	
Outlet - 2		
1		0.47
Total	6.17	6.52

Table QUANTITIY CALCULATION OF FORM WORK

Package I No.3.1/19, 20

Sluiceway No. : SKE-1R Location : KE21+5m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 0.8 m : Height 0.8 m

Length : 3.591 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		1.32
2	0.16	0.16
3	1.24	1.24
4	0.43	
5	0.32	
Conduit -1		
1		0.44
2		1.10
3		0.36
4		0.72
5		0.24
6		0.72
Conduit-2		
1	5.74	
2	3.04	
Outlet - 1		
1		
2		
3		
4	5.65	
5	0.92	
6		0.36
Outlet - 2		
1		
2		
3		4.21
4		0.90
Outlet - 3		
1	9.62	
2	-0.21	
Foundation concrete		
1	5.90	
Total	32.82	11.78

SW-109

Table QUANTITIY CALCULATION OF FORM WORK

Package I No.3.1/19, 20

Sluiceway No. : SKE-2R Location : KE25-5m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 0.9 m : Height 0.9 m

Length : 9.044 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		1.09
2		2.73
Partition wall		
1	5.16	
2	7.28	
3	0.30	
Conduit 1		
1	5.19	
2	0.87	
3		0.79
4	0.72	
5	0.77	
6	0.60	
Conduit 2		
1	0.47	
2	2.75	
3	0.32	
Conduit 3		
1	11.80	
2	5.90	
3		11.80
Conduit 4		
1	0.90	
2	12.01	
3	4.06	
Outlet 1		
1		
2		
3		
4	5.70	
5	1.66	
6	1.57	
7		0.36
Outlet 2		
1		
2		
3		1.80
4		0.86
Outlet 3		
1	7.13	
2	1.20	
Foundation concrete		
1	5.00	
Total	81.36	19.43

Table QUANTITIY CALCULATION OF FORM WORK

Package I No.3.1/19, 20

Sluiceway No. : SKE-3R Location : KE31+0m

Nos.of lane : 1 Gate type : Flap Gate

Conduit size : Width 0.4 m : Height 0.4 m

Length : 1,700 m

	F1(No.3.1/19) (sq.m)	F2(No.3.1/20) (sq.m)
Inlet 1		
1		0.77
2		0.30
3	0.60	
4		1.62
5	1.62	
6	0.44	
Conduit - 1		
1		0.22
2		0.77
3		0.27
4		0.54
5		0.12
6		0.54
Conduit - 2		
1	0.56	
2	0.99	
Outlet - 1		
1		
2	1.44	
3		0.90
4	0.47	
Outlet - 2		
1		0.47
Total	6.12	6.52

SW-108

Table QUANTITIY CALCULATION OF FORM WORK

Package 2 No.3.1/17, 18

Sluiceway No. : STM-1L Location : TM25-13m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 0.8 m : Height 0.8 m

Length : 3.786 m

	F1(No.3.1/17) (sq.m)	F2(No.3.1/18) (sq.m)
Inlet 1		
1		1.66
2	0.16	0.16
3	3.82	3.82
4	0.70	
5	0.32	
Conduit -1		
1		0.44
2		1.44
3		0.45
4		0.91
5		0.24
6		0.91
Conduit-2		
1	6.06	
2	3.04	
Outlet - 1		
1		
2		
3		
4	7.10	
5	1.32	
6		0.45
Outlet - 2		
1		
2		
3		5.13
4		1.24
Outlet - 3		
1	12.08	
2	-0.39	
Foundation concrete		
1	5.90	
Total	40.11	16.85

Table QUANTITIY CALCULATION OF FORM WORK

Package 2 No.3.1/17, 18

Sluiceway No. : STM-2L Location : TM30-10m

Nos.of lane : 2 Gate type : Slide Gate

Conduit size : Width 1.0 m : Height 1.0 m

Length : 2.200 m

	F1(No.3.1/17) (sq.m)	F2(No.3.1/18) (sq.m)
Inlet		
1		2.89
2		1.05
3		0.78
4	1.56	
5		1.15
6	0.45	
7	1.15	
Conduit - 1		
1		1.10
2		2.89
3		0.91
4		1.82
5		0.30
6		1.82
Conduit - 2		
1	2.24	
2	0.70	
Outlet - 1		
1		
2		
3		
4	11.67	
5	1.27	
6	2.55	
7		0.91
Outlet - 2		
1		
2		
3		3.94
4		2.46
Total	21.58	22.02

SW-10f

Table QUANTITIY CALCULATION OF FORM WORK

Package 2 No.3.1/17,18

Sluiceway No. : STM-3L Location : TM30+16m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 0.8 m : Height 0.8 m

Length : 2.200 m

	F1(No.3.1/17) (sq.m)	F2(No.3.1/18) (sq.m)
Inlet		
1		1.45
2		0.38
3		3.71
4	1.45	
5	0.76	
6	3.71	
7	0.69	
Conduit - 1		
1		0.44
2		1.45
3		0.46
4		0.91
5		0.24
6		0.91
Conduit - 2		
1	2.24	
2	0.70	
Outlet - 1		
1		
2		
3		
4	7.59	
5	1.33	
6		0.46
Outlet - 2		
1		
2		
3		1.97
4		1.25
Total	18.47	13.62

Table QUANTITIY CALCULATION OF FORM WORK

Package 2 No.3.1/17,18

Sluiceway No. : STM-4L Location : TM33+13m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.0 m : Height 1.0 m

Length : 2.200 m

	F1(No.3.1/17) (sq.m)	F2(No.3.1/18) (sq.m)
Inlet		
1		1.46
2		0.42
3		2.58
4	1.46	
5	0.84	
6	2.58	
7	0.58	
Conduit - 1		
1		0.55
2		1.46
3		0.46
4		0.92
5		0.30
6		0.92
Conduit - 2		
1	2.24	
2	0.70	
Outlet - 1		
1		
2		
3		
4	7.63	
5	1.29	
6		0.46
Outlet - 2		
1		
2		
3		1.98
4		1.24
Total	17.33	12.75

Table QUANTITIY CALCULATION OF FORM WORK

Package 2 No.3.1/17, 18

Sluiceway No. : STM-1R Location : TM25-13m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 0.8 m : Height 0.8 m

Length : 3.786 m

	F1(No.3.1/17) (sq.m)	F2(No.3.1/18) (sq.m)
Inlet 1		
1		1.66
2	0.16	0.16
3	2.79	2.79
4	0.60	
5	0.32	
Conduit -1		
1		0.44
2		1.44
3		0.45
4		0.91
5		0.24
6		0.91
Conduit-2		
1	6.06	
2	3.04	
Outlet - 1		
1		
2		
3		
4	7.10	
5	1.32	
6		0.45
Outlet - 2		
1		
2		
3		5.13
4		1.24
Outlet - 3		
1	12.08	
2	-0.39	
Foundation concrete		
1	5.90	
Total	38.99	15.83

Table QUANTITIY CALCULATION OF FORM WORK

Package 2 No.3.1/17, 18

Sluiceway No. : STM-2R Location : TM30+3m

Nos.of lane : 1 Gate type : Flap Gate

Conduit size : Width 0.4 m : Height 0.4 m

Length : 7.030 m

	F1(No.3.1/17) (sq.m)	F2(No.3.1/18) (sq.m)
Inlet 1		
1		0.77
2		1.93
Partition wall		
1	4.06	
2	5.80	
3	0.30	
Conduit 1		
1		0.68
2	0.48	
Conduit 2		
1	0.62	
2	1.43	
3	0.82	
Conduit 3		
1	4.66	
2	2.33	
3		4.66
Conduit 4		
1	0.84	
2	1.55	
3	1.75	
Outlet 1		
1		
2	4.00	
3	0.69	
4	1.42	
5		1.22
Outlet 2		
1		0.83
Total	30.76	10.09

Sw-11

Table QUANTITIY CALCULATION OF FORM WORK

Package 2 No.3.1/17, 18

Sluiceway No. : STM-3R Location : TM35+0m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 0.8 m ; Height 0.8 m

Length : 7.840 m

	F1(No.3.1/17) (sq.m)	F2(No.3.1/18) (sq.m)
Inlet 1		
1		1.10
2		2.74
Partition wall		
1	5.68	
2	1.60	
3	0.30	
Conduit 1		
1		0.91
2	0.64	
Conduit 2		
1	0.63	
2	2.04	
3	0.74	
Conduit 3		
1	9.82	
2	4.91	
3		9.82
Conduit 4		
1	0.84	
2	2.65	
3	1.82	
Outlet 1		
1		
2		
3		
4	8.63	
5	1.36	
6	2.29	
7		0.46
Outlet 2		
1		
2		
3		2.26
4		1.28
Total	43.95	18.57

SW-112

Table QUANTITIY CALCULATION OF FORM WORK

Package 2 No.3.1/17, 18

Sluiceway No. : SNM-1R Location : NM34+0m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.1 m ; Height 1.1 m

Length : 2.200 m

	F1(No.3.1/17) (sq.m)	F2(No.3.1/18) (sq.m)
Inlet 1		
1		1.61
2		0.44
3	0.88	
4		3.21
5	3.21	
6	0.65	
Conduit - 1		
1		0.61
2		1.61
3		0.50
4		1.00
5		0.33
6		1.00
Conduit - 2		
1	0.24	
2	1.12	
Outlet - 1		
1		
2		
3		
4	6.33	
5	1.45	
6		1.00
Outlet - 2		
1		
2		
3		2.16
4		1.12
Total	13.88	14.59

Table QUANTITIY CALCULATION OF FORM WORK

Package 3 No.3.1/25, 26

Sluiceway No. : SGM-1L Location : GM12+0m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 0.8 m : Height 0.8 m

Length : 9.278 m

	F1(No.3.1/25) (sq.m)	F2(No.3.1/26) (sq.m)
Inlet 1		
1		1.02
2		2.54
Partition wall		
1	6.37	
2	8.09	
3	0.30	
Conduit 1		
1	7.71	
2	1.24	
3		0.75
4	0.64	
5	0.64	
6	0.57	
Conduit 2		
1	0.47	
2	2.22	
3	0.94	
Conduit 3		
1	10.57	
2	5.29	
3		10.57
Conduit 4		
1	0.80	
2	17.18	
3	4.35	
Outlet 1		
1		
2		
3		
4	8.17	
5	2.15	
6	2.50	
7		0.50
Outlet 2		
1		
2		
3		2.41
4		1.40
Outlet 3		
1	9.92	
2	1.84	
Foundation concrete		
1	4.90	
Total	96.86	19.19

Table QUANTITIY CALCULATION OF FORM WORK

Package 3 No.3.1/25, 26

Sluiceway No. : SGM-2L Location : GM14+5m

Nos.of lane : 2 Gate type : Slide Gate

Conduit size : Width 1.0 m : Height 1.0 m

Length : 10.772 m

	F1(No.3.1/25) (sq.m)	F2(No.3.1/26) (sq.m)
Inlet 1		
1		1.44
2		3.61
Inlet 2		
1		1.08
2		0.90
Inlet 3		
1		2.73
2		12.02
3		2.21
4		12.02
5		1.11
Conduit 1		
1	0.88	
2	3.53	
3	1.24	
Conduit 2		
1		32.42
2		16.21
3	16.21	
Conduit 3		
1	1.17	
2	4.44	
3	1.54	
4	1.81	
Outlet 1		
1		
2	7.63	
3	1.68	
4		
5	8.52	
6	4.73	
7	9.42	
8		1.35
Outlet 2		
1		
2		
3		6.35
4		4.35
Outlet 3		
1	26.25	
2	2.49	
Foundation concrete		
1	9.20	
Total	100.75	97.81

SW-113

Table QUANTITIY CALCULATION OF FORM WORK

Package 3 No.3.1/25, 26

Sluiceway No. : SGM-3L Location : GM15+24m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 0.8 m : Height 0.8 m

Length : 11.336 m

	F1(No.3.1/25) (sq.m)	F2(No.3.1/26) (sq.m)
Inlet 1		
1		1.06
2		2.65
Conduit 1		
1	4.72	
2	0.72	
3		0.84
4	0.64	
5	0.64	
6	0.57	
Conduit 2		
1	0.52	
2	3.05	
3	0.92	
Conduit 3		
1	13.87	
2	6.94	
3		13.87
Conduit 4		
1	0.80	
2	13.78	
3	4.35	
Outlet 1		
1		
2		
3		
4	8.07	
5	2.13	
6	2.47	
7		0.49
Outlet 2		
1		
2		
3		2.39
4		1.38
Outlet 3		
1	13.08	
2	1.80	
Foundation concrete		
1	5.90	
Total	84.97	22.67

Table QUANTITIY CALCULATION OF FORM WORK

Package 3 No.3.1/25, 26

Sluiceway No. : SGM-1R Location : GM04+44m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 0.8 m : Height 0.8 m

Length : 3.978 m

	F1(No.3.1/25) (sq.m)	F2(No.3.1/26) (sq.m)
Inlet 1		
1		1.64
2	0.16	0.16
3	3.09	3.09
4	0.63	
5	0.32	
Conduit -1		
1		0.44
2		1.42
3		0.45
4		0.89
5		0.24
6		0.89
Conduit-2		
1	6.36	
2	3.04	
Outlet - 1		
1		
2		
3		
4	6.99	
5	1.29	
6		0.45
Outlet - 2		
1		
2		
3		5.06
4		1.22
Outlet - 3		
1	11.90	
2	-0.70	
Foundation concrete		
1	5.90	
Total	39.00	15.94

Table QUANTITIY CALCULATION OF FORM WORK

Package 3 No.3.1/25, 26

Sluiceway No. : SGM-2R Location : GM12+0m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 0.8 m : Height 0.8 m

Length : 3.941 m

	F1(No.3.1/25) (sq.m)	F2(No.3.1/26) (sq.m)
Inlet 1		
1		1.82
2	0.16	0.16
3	3.31	3.31
4	0.66	
5	0.32	
Conduit -1		
1		0.44
2		1.60
3		0.50
4		0.99
5		0.24
6		0.99
Conduit-2		
1	6.31	
2	3.04	
Outlet - 1		
1		
2		
3		
4	7.77	
5	1.51	
6		0.50
Outlet - 2		
1		
2		
3		5.56
4		1.40
Outlet - 3		
1	13.23	
2	-0.71	
Foundation concrete		
1	5.90	
Total	41.50	17.50

Table QUANTITIY CALCULATION OF FORM WORK

Package 3 No.3.1/25, 26

Sluiceway No. : SCM-1L Location : CM05-5m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.3 m : Height 1.3 m

Length : 2.200 m

	F1(No.3.1/25) (sq.m)	F2(No.3.1/26) (sq.m)
Inlet 1		
1		1.87
2		0.48
3	0.96	
4		6.86
5	6.86	
6	0.94	
Conduit - 1		
1		0.72
2		1.87
3		0.57
4		1.14
5		0.39
6		1.14
Conduit - 2		
1	0.24	
2	1.28	
Outlet - 1		
1		
2		
3		
4	7.23	
5	1.74	
6		1.14
Outlet - 2		
1		
2		
3		2.47
4		1.35
Total	19.24	20.01

SW-11

Table QUANTITIY CALCULATION OF FORM WORK

Package 3 No.3.1/25, 26

Sluiceway No. : SCM-2L Location : CM16+12m

Nos.of lane : 2 Gate type : Slide Gate

Conduit size : Width 1.2 m : Height 1.2 m

Length : 7.439 m

	F1(No.3.1/25) (sq.m)	F2(No.3.1/26) (sq.m)
Inlet 1		
1		1.39
2		3.47
Inlet 2		
1		1.04
2		1.23
Partition wall (Inlet)		
1	2.48	
2	11.25	
3	0.30	
Conduit 1		
1	3.86	
2	0.53	
3	2.56	
Conduit 2		
1	2.47	
Conduit 3		
1	0.83	
2	1.72	
3	1.55	
Conduit 4		
1	8.01	
2		16.03
3	3.61	
4	2.56	
5		3.41
6		2.24
7		3.81
8		2.19
9	10.29	
10	14.82	
Conduit 5		
1	0.80	
2	14.44	
3	2.96	
4	1.50	
5	4.24	
Partition wall (Outlet)		
1	12.53	
2	10.18	
3	0.30	
Outlet 1		
1	5.42	
2	2.29	
3	1.67	
4		2.50
5	2.08	
6	5.83	
Outlet 2		
1		
2		
3		5.94
4		0.55
Outlet 3		
1	12.14	
2	1.95	
3	24.28	
Foundation concrete		
1	7.24	
2	1.94	
3	4.34	
Total	187.43	44.30

Table QUANTITIY CALCULATION OF FORM WORK

Package 3 No.3.1/25, 26

Sluiceway No. : SCM-3L Location : CM20+10m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.0 m : Height 1.0 m

Length : 7.458 m

	F1(No.3.1/25) (sq.m)	F2(No.3.1/26) (sq.m)
Inlet 1		
1		1.29
2		3.23
Partition wall (Inlet)		
1	8.01	
2	9.18	
3	0.30	
Conduit 1		
1	3.19	
2	0.62	
3	1.83	
Conduit 2		
1	2.08	
Conduit 3		
1	1.02	
2	0.84	
3	0.59	
Conduit 4		
1	9.92	
2	8.43	
3	1.42	
4	3.08	
5	2.06	
6		11.92
7		5.96
Conduit 5		
1	2.80	
2	2.07	
3	1.98	
4	1.50	
5	3.12	
Partition wall (Outlet)		
1	12.50	
2	10.14	
3	0.30	
Outlet 1		
1	5.39	
2	2.28	
3		1.24
4	1.04	
5	2.90	
Outlet 2		
1		
2		
3		2.96
4		1.96
Outlet 3		
1	11.48	
2	1.94	
3	20.06	
Foundation concrete		
1	6.12	
2	1.64	
3	3.67	
Total	143.90	28.56

SW-116

Table QUANTITIY CALCULATION OF FORM WORK

Package 3 No.3.1/25, 26

Sluiceway No. : SCM-4L Location : CM27-21m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.1 m : Height 1.1 m

Length : 2.000 m

	F1(No.3.1/25) (sq.m)	F2(No.3.1/26) (sq.m)
Inlet 1		
1		2.24
2		0.30
3		0.36
4	2.98	
5	0.88	
Conduit		
1	9.75	
2	1.02	
3	2.85	
4	3.27	
5	0.55	
6		4.89
7		2.68
8		
9		
10		
11		3.87
12		1.64
Parapet wall		
1	34.09	
2	2.42	
Foundation concrete		
1	5.49	
Total	63.31	15.99

SW-17

Table QUANTITIY CALCULATION OF FORM WORK

Package 3 No.3.1/25, 26

Sluiceway No. : SCM-5L Location : CM30+0m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.0 m : Height 1.0 m

Length : 5.518 m

	F1(No.3.1/25) (sq.m)	F2(No.3.1/26) (sq.m)
Inlet 1		
1		1.18
2		2.96
Partition wall (Inlet)		
1	5.86	
2	8.71	
3	0.30	
Conduit 1		
1	2.26	
2	0.48	
3	1.67	
Conduit 2		
1	1.51	
Conduit 3		
1	0.78	
2	0.84	
3	0.59	
Conduit 4		
1	6.04	
2	6.97	
3	1.33	
4	3.00	
5	1.98	
6		8.04
7		4.02
Conduit 5		
1	2.80	
2	1.88	
3	1.21	
4	1.50	
5	3.04	
Partition wall (Outlet)		
1	12.28	
2	9.97	
3	0.30	
Outlet 1		
1	4.73	
2	2.00	
3		1.09
4	0.91	
5	2.55	
Outlet 2		
1		
2		
3		2.63
4		1.63
Outlet 3		
1	10.68	
2	1.87	
3	18.56	
Foundation concrete		
1	6.04	
2	1.62	
3	3.62	
Total	127.87	21.54

Table QUANTITIY CALCULATION OF FORM WORK

Package 3 No.3.1/25, 26

Sluiceway No. : SCM-6L Location : CM37+30m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.1 m : Height 1.1 m

Length : 7.582 m

	F1(No.3.1/25) (sq.m)	F2(No.3.1/26) (sq.m)
Inlet 1		
1		1.30
2		3.25
Partition wall (Inlet)		
1	8.03	
2	9.10	
3	0.30	
Conduit 1		
1	2.67	
2	0.52	
3	1.81	
Conduit 2		
1	2.54	
Conduit 3		
1	0.82	
2	0.88	
3	0.62	
Conduit 4		
1	11.18	
2	8.10	
3	1.43	
4	2.99	
5	1.92	
6		13.38
7		6.69
Conduit 5		
1	2.80	
2	2.04	
3	2.03	
4	1.50	
5	3.01	
Partition wall (Outlet)		
1	12.12	
2	9.83	
3	0.30	
Outlet 1		
1	5.15	
2	2.18	
3		1.19
4	0.99	
5	2.77	
Outlet 2		
1		
2		
3		2.83
4		1.84
Outlet 3		
1	10.02	
2	1.81	
3	17.33	
Foundation concrete		
1	6.01	
2	1.61	
3	3.61	
Total	138.03	30.48

Table QUANTITIY CALCULATION OF FORM WORK

Package 3 No.3.1/25, 26

Sluiceway No. : SCM-7L Location : CM41+00m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.1 m : Height 1.1 m

Length : 7.618 m

	F1(No.3.1/25) (sq.m)	F2(No.3.1/26) (sq.m)
Inlet 1		
1		1.27
2		3.18
Partition wall (Inlet)		
1	5.90	
2	9.03	
3	0.30	
Conduit 1		
1	2.47	
2	0.49	
3	1.78	
Conduit 2		
1	2.56	
Conduit 3		
1	0.79	
2	0.88	
3	0.62	
Conduit 4		
1	11.26	
2	7.82	
3	1.41	
4	2.94	
5	1.88	
6		13.46
7		6.73
Conduit 5		
1	2.80	
2	2.01	
3	2.05	
4	1.50	
5	2.96	
Partition wall (Outlet)		
1	11.98	
2	9.72	
3	0.30	
Outlet 1		
1	5.09	
2	2.14	
3		1.17
4	0.97	
5	2.72	
Outlet 2		
1		
2		
3		2.79
4		1.79
Outlet 3		
1	9.56	
2	1.77	
3	16.47	
Foundation concrete		
1	5.96	
2	1.60	
3	3.58	
Total	133.31	30.39

Table QUANTITIY CALCULATION OF FORM WORK

Package 3 No.3.1/25, 26

Sluiceway No. : SCM-8L Location : CM47+34m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 0.9 m : Height 0.9 m

Length : 6.372 m

	F1(No.3.1/25) (sq.m)	F2(No.3.1/26) (sq.m)
Inlet 1		
1		1.08
2		2.70
Partition wall		
1	5.76	
2	8.65	
3	0.30	
Conduit 1		
1	10.50	
2	1.42	
3		0.77
4	0.72	
5	0.77	
6	0.60	
Conduit 2		
1	0.45	
2	1.28	
3	1.04	
Conduit 3		
1	6.51	
2	3.26	
3		6.51
Conduit 4		
1	0.90	
2	9.13	
3	4.49	
Outlet 1		
1		
2		
3		
4	9.16	
5	2.58	
6	2.87	
7		0.55
Outlet 2		
1		
2		
3		2.65
4		1.64
Outlet 3		
1	11.05	
2	2.09	
Foundation concrete		
1	5.00	
Total	88.54	15.92

Table QUANTITIY CALCULATION OF FORM WORK

Package 3 No.3.1/25, 26

Sluiceway No. : SCM-1R Location : CM15-10m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.2 m : Height 1.2 m

Length : 4.429 m

	F1(No.3.1/25) (sq.m)	F2(No.3.1/26) (sq.m)
Inlet 1		
1		1.96
2	0.24	0.24
3	4.33	4.33
4	0.75	
5	0.48	
Conduit -1		
1		0.66
2		1.74
3		0.54
4		1.07
5		0.36
6		1.07
Conduit-2		
1	7.09	
2	3.68	
Outlet - 1		
1		
2		
3		
4	8.39	
5	1.59	
6		0.54
Outlet - 2		
1		
2		
3		5.96
4		1.54
Outlet - 3		
1	14.28	
2	-1.74	
Foundation concrete		
1	6.30	
Total	45.39	20.00

Table QUANTITIY CALCULATION OF FORM WORK

Package 3 No.3.1/25, 26

Sluiceway No. : SCM-2R Location : CM16+4m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.2 m : Height 1.2 m

Length : 2.000 m

	F1(No.3.1/25) (sq.m)	F2(No.3.1/26) (sq.m)
Inlet		
1		2.29
2		0.32
3		0.45
4	3.46	
5	0.92	
Conduit		
1	9.94	
2	1.04	
3	2.92	
4	3.35	
5	0.58	
6		5.00
7		2.73
8		
9		
10		
11		3.96
12		1.69
Parapet wall		
1	36.23	
2	2.43	
Foundation concrete		
1	5.74	
Total	66.61	16.44

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Table QUANTITIY CALCULATION OF FORM WORK

Package 3 No.3.1/25, 26

Sluiceway No. : SCM-3R Location : CM26+1m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.0 m : Height 1.0 m

Length : 2.000 m

	F1(No.3.1/25) (sq.m)	F2(No.3.1/26) (sq.m)
Inlet		
1		2.25
2		0.28
3		0.19
4	2.15	
5	0.84	
Conduit		
1	9.79	
2	1.02	
3	2.87	
4	3.30	
5	0.53	
6		4.92
7		2.69
8		
9		
10		
11		3.89
12		1.66
Parapet wall		
1	30.90	
2	2.53	
Foundation concrete		
1	5.07	
Total	59.00	15.88

Table QUANTITIY CALCULATION OF FORM WORK

Package 3 No.3.1/25, 26

Slusceway No. : SCM-4R Location : CM30+0m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.0 m : Height 1.0 m

Length : 7.518 m

	F1(No.3.1/25) (sq.m)	F2(No.3.1/26) (sq.m)
Inlet 1		
1		1.25
2		3.12
Partition wall (Inlet)		
1	7.46	
2	9.07	
3	0.30	
Conduit 1		
1	2.84	
2	0.56	
3	1.79	
Conduit 2		
1	2.51	
Conduit 3		
1	0.96	
2	0.84	
3	0.59	
Conduit 4		
1	10.04	
2	7.98	
3	1.39	
4	3.00	
5	1.98	
6		12.04
7		6.02
Conduit 5		
1	2.80	
2	2.03	
3	2.01	
4	1.50	
5	3.04	
Partition wall (Outlet)		
1	12.28	
2	9.97	
3	0.30	
Outlet 1		
1	5.25	
2	2.22	
3		1.21
4	1.01	
5	2.83	
Outlet 2		
1		
2		
3		2.89
4		1.89
Outlet 3		
1	10.68	
2	1.87	
3	18.56	
Foundation concrete		
1	6.04	
2	1.62	
3	3.62	
Total	138.92	28.41

Table QUANTITIY CALCULATION OF FORM WORK

Package 3 No.3.1/25, 26

Slusceway No. : SCM-5R Location : CM37+0m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.0 m : Height 1.0 m

Length : 5.576 m

	F1(No.3.1/25) (sq.m)	F2(No.3.1/26) (sq.m)
Inlet 1		
1		1.23
2		3.08
Partition wall (Inlet)		
1	8.00	
2	9.03	
3	0.30	
Conduit 1		
1	2.72	
2	0.54	
3	1.78	
Conduit 2		
1	1.54	
Conduit 3		
1	0.94	
2	0.84	
3	0.59	
Conduit 4		
1	6.15	
2	7.83	
3	1.37	
4	2.94	
5	1.93	
6		8.15
7		4.08
Conduit 5		
1	2.80	
2	2.01	
3	1.23	
4	1.50	
5	2.97	
Partition wall (Outlet)		
1	12.13	
2	9.84	
3	0.30	
Outlet 1		
1	5.15	
2	2.18	
3		1.19
4	0.99	
5	2.77	
Outlet 2		
1		
2		
3		2.84
4		1.84
Outlet 3		
1	10.07	
2	1.82	
3	17.42	
Foundation concrete		
1	5.97	
2	1.60	
3	3.58	
Total	130.84	22.41

SW-12-1

Table QUANTITIY CALCULATION OF FORM WORK

Package 3 No.3.1/25, 26

Sluiceway No. : SCM-6R Location : CM43+30m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 1.1 m : Height 1.1 m

Length : 5.638 m

	F1(No.3.1/25) (sq.m)	F2(No.3.1/26) (sq.m)
Inlet 1		
1		1.25
2		3.14
Partition wall (Inlet)		
1	7.60	
2	8.99	
3	0.30	
Conduit 1		
1	2.34	
2	0.47	
3	1.77	
Conduit 2		
1	1.57	
Conduit 3		
1	0.77	
2	0.88	
3	0.62	
Conduit 4		
1	6.90	
2	7.65	
3	1.39	
4	2.90	
5	1.84	
6		9.10
7		4.55
Conduit 5		
1	2.80	
2	1.99	
3	1.26	
4	1.50	
5	2.91	
Partition wall (Outlet)		
1	11.83	
2	9.62	
3	0.30	
Outlet 1		
1	4.96	
2	2.10	
3		1.14
4	0.95	
5	2.67	
Outlet 2		
1		
2		
3		2.74
4		1.74
Outlet 3		
1	9.13	
2	1.73	
3	15.67	
Foundation concrete		
1	5.91	
2	1.58	
3	3.55	
Total	126.45	23.67

Table QUANTITIY CALCULATION OF FORM WORK

Package 3 No.3.1/25, 26

Sluiceway No. : SCM-7R Location : CM47+53m

Nos.of lane : 1 Gate type : Slide Gate

Conduit size : Width 0.8 m : Height 0.8 m

Length : 9.369 m

	F1(No.3.1/25) (sq.m)	F2(No.3.1/26) (sq.m)
Inlet 1		
1		1.00
2		2.51
Partition wall		
1	5.77	
2	8.46	
3	0.30	
Conduit 1		
1	9.90	
2	1.38	
3		0.73
4	0.64	
5	0.64	
6	0.57	
Conduit 2		
1	0.46	
2	2.23	
3	1.14	
Conduit 3		
1	10.59	
2	5.29	
3		10.59
Conduit 4		
1	0.80	
2	19.27	
3	4.48	
Outlet 1		
1		
2		
3		
4	9.14	
5	2.39	
6	2.85	
7		0.55
Outlet 2		
1		
2		
3		2.65
4		1.60
Outlet 3		
1	11.03	
2	2.09	
Foundation concrete		
1	4.90	
Total	104.33	19.64

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Package 3: Saluran Cengkarang Drainage Channel
Outlet Sluiceway

/25 Form F1

for Joints 100.266 m² (See No.10)

Openculvert + Sluice way

1.85 x 15.3 + 0.8 x 5.5 x 2 + (0.5 + 0.8) x 3.86 x 2 = 47.141 m²

Earth : (1.7 + 0.566 + 2.65 + 0.283 + 0.819) x 16.3 = 98.012 m²

Outlet wing : {(3.50 x 2 + 0.3) x 3.7 + 1.0 x 0.5} x 2 = 55.02 m²

Outlet : end : 15.3 x 1.3 = 19.89 m²

side : (2.4 + 0.424) x 4.95 x 2 = 27.958 m²

end . 0.55 x 22.3 = 12.265 m²

0.55 x 16.5 = 9.075 m²

0.55 x 4.95 x 2 = 5.445 m²

Conduit Side : (12.3 x 3.45 + 2.1 x 0.35 + 0.4 x 0.4 x ½ + 1.45 x 2.7) x 2 = 94.33 m²

0.4 x 16.3 = 6.52 m²

wing wall (4.0 x 3.0 - 2.5 x 2.5 x ½) x 2 + 0.3 x 1.5 x 2 = 18.65 m²

partition wall : 0.5 x 2 x (6 + 6.2) + 0.3 x 2 = 12.8 m²

Hoist : (1.1 x 2.65 x 2 + 2.7 x 3.05 + 0.75 x 2.9 x 2 + 0.2 x 4 x 29 + 1.1 x 2.7 + 0.3 x 2.3) x 5
= 121.975 m²

for 2nd concrete

{(0.2 + 0.25) x 2.5 x 2 + 0.6 x 2.7 x 2 + 0.5 x 2.3} x 5 = 33.20 m²

Inlet side : {5.45 x 4.5 - (0.5 + 2.85) ½ x 1.09} x 2 = 45.399 m²

end : 1.85 x 15.3 + (0.5 + 0.8) x 10.547 = 42.016 m²

Total 649.696 m²

Package3 Saluran Cengkareng Drainage Channel
Outlet Sluice way

126 Form F2.

Outlet End sill : 0.671×15.3 = 10.264 m²
Outlet Side: 2.717×4.95×2 = 26.898 m²
Conduit : water pass
(2.466×2+2.3)×5 = 36.157 m²
Conduit : open
(2.7×2×5)×1.0 = 27.0 m²
: pier to outlet
(0.55×10+0.8×3+1.2)×2.7 = 24.57 m²
: end (downstream)
0.3×2.3×5+0.2×0.2×5 = 3.65 m²
: end (upstream)
2.6×2.5×5 = 32.5 m²
Wing wall : (4.0×3.0 − 2.5×2.5×1/2)×2+0.3×1.5×2 = 18.65 m²
Hoist : (0.3×2)×16.3+0.3×2.7×2 +0.45×16.3 = 18.735 m²
end : (0.8×3+0.6×2)×2.65+0.15×0.5×5 = 9.915 m²
Inlet Pier : (1.15×2×5+0.6×3+1.0+1.45×2.5)×5+0.2×15.5 = 87.725 m²
2.407×15.5 = 37.309 m²
side (inside) 14.932×2 = 29.869 m²
Side wall slope 2.59×0.5×2 = 2.59 m²

Total 365.827 m²

1.3.2 Connection canal / Cross drain

Summary of Work Quantities, Connection Canal / Cross Drain

Package 1

Item No.	Description	Unit	Total Package 1	Kamal				
				Stage1 main	Stage2 main	Stage3 Total	Stage3 main	Stage3 branch
3.2	Connection Canal / Cross Drain							
/ 01	Coffering and care of water including dewatering	L.S.						
/ 02	Trench excavation	cu.m	2,064	105	883	1,076	179	897
/ 03	Backfilling with excavated materials	cu.m	423	21	172	230	35	195
/ 04	Geo-textile, t= 1.5 mm	sq.m	142			142		142
/ 05	Gravel bedding	cu.m	365	17	145	203	31	172
/ 06	Concrete, type 4, for slab, strut and facing concrete of wet rubble masonry	cu.m	18			18		18
/ 07	Concrete, type 5, for leveling	cu.m	5			5		5
/ 08	Form, type F2, for Item No. 3.2/06	sq.m	95			95		95
/ 09	Reinforcing bars, for Item No. 3.2/06	kg	963			963		963
/ 10	Rubber joint filler, t =10 mm	sq.m	6			6		6
/ 11	Precast concrete culvert, 400x400mm	lin.m	46		4	42	4	38
/ 12	Precast concrete side ditch, U-type, 400x400mm	lin.m	7,556	421	3,557	3,578	719	2,859
/ 13	Precast concrete side ditch, L-type, 300x300mm	lin.m	825			825		825

Package 2

Item No.	Description	Unit	Total Package 2	Tanjungan	PIK Junction
3.2	Connection Canal / Cross Drain				
/ 01	Coffering and care of water including dewatering	L.S.			
/ 02	Trench excavation	cu.m	300	253	47
/ 03	Backfilling with excavated materials	cu.m	60	51	9
/ 04	Gravel bedding	cu.m	57	43	14
/ 05	Precast concrete culvert, 400x400mm	lin.m	8		8
/ 06	Precast concrete side ditch, U-type, 400x400mm	lin.m	1,017	1,017	
/ 07	Precast concrete side ditch, L-type, 300x300mm	lin.m	320		320

Package 3

Item No.	Description	Unit	Total Package 3	Gede/Bor	Saluran Cengkareng	Meruya
3.2	Connection Canal / Cross Drain					
/ 01	Coffering and care of water including dewatering	L.S.				
/ 02	Trench excavation	cu.m	2,323	373	1,950	
/ 03	Backfilling with excavated materials	cu.m	453	75	378	
/ 04	Gravel bedding	cu.m	398	69	329	
/ 05	Concrete, type 4, for slab, strut and facing concrete of wet rubble masonry	cu.m	1	1		
/ 06	Concrete, type 5, for leveling	cu.m	1	1		
/ 07	Form, type F2, for Item No. 3.2/05	sq.m	8	8		
/ 08	Reinforcing bars, for Item No. 3.2/05	kg	46	46		
/ 09	Rubber joint filler, t =10 mm	sq.m	2	2		
/ 10	Precast concrete culvert, 400x400mm	lin.m	46	19	27	
/ 11	Precast concrete side ditch, U-type, 400x400mm	lin.m	9,339	1,480	7,859	

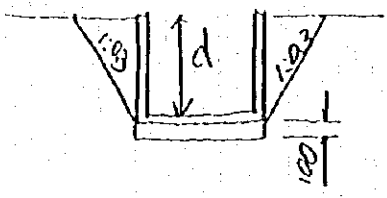
Calculation formula

3.2 Connection canal / Cross Drain

○ Side ditch

Length of Side ditch : L (m)

/02 Trench excavation



$\{d \times (d+a1) + d \times a3d\} \times L$.

$= d(1.3d + 0.1) \times L$

d = 0.3m or 0.4m

/03 Back filling with exacated materials.

$L \times d \times 0.3d = 0.3d^2 \times L$.

/05 Gravel Bedding.
(or/04) $d \times 0.1 \times L$.

/1, /12, /13 Precast concrete side ditch
(or/5/06, /07)
or /12, /11) L (lin. m)

○Culvert L4+L5 = Length of culvert

102 Trench excavation

$\{ H \times (B_o + 0.6) + H \times H \} \times (L4+L5)$

103 Back filling with excavated materials

$H \times H \times (L4+L5)$ $H = H_o + 0.55$

106 Concrete Type 4

(or/05) $\{(B_o+0.4)(H_o+0.45) - H_oB_o + 2\times0.1\times0.1\} \times (L4+L5)$

$+ (0.35+0.45\times2+0.35) \times \{2(B_o+0.6) + 2H_o\} \times 0.1$

$= (0.45B_o + 0.4H_o + 0.2)(L4+L5) + 0.32(B_o + H_o + 0.6)$

107 Concrete type 5

(or/06) $(B_o+0.6) \times (L5+L4) \times 0.1$

108 Form type F1

(or/07)

$S_1 = (H_o+0.45)\times2\times(L5-025) + (H_o+0.65)\times(0.25+0.35)\times2$

$S_2 = (H_o\times2+B_o)(L4+L5)$

$S_3 = \{(H_o+0.65)\times(B_o+0.6) - H_oB_o\} \times 2$

$= \{0.6H_o + 0.65B_o + 0.39\} \times 2$

$= 1.2H_o + 1.3B_o + 0.78$

109 Reinforcing bars

(or/08) ∇(No.10) $\times$ 60 (kg/m³)

110 Rubber joint filler

(or/09) $0.35 \times 1.118 \times (H_o+0.65) \times 2$

$= 0.783 \times (H_o+0.65)$

○ Drain ditch. L3+L4 = length of culvert.

102 Trench excavation.

$\{(B_o+0.5)\times(H_o+0.25) + (H_o+0.25)^2\} \times (L3+L4)$

103 Back filling

$(H_o+025)^2 \times (L3+L4)$

106 Concrete type 4

(or/05) $\{(H_o+0.15)\times0.15\times2 + B_o\times0.15 + 0.1\times0.1\} \times (L3+L4)$

$- (0.3H_o + 0.045 + 0.15B_o + 0.01)(L3+L4)$

107 Concrete Type 5

(or/06) $(B_o+0.5)\times0.1\times(L3+L4)$

108 Form type F1

(or/07)

$S_1 = (H_o+0.15)\times2\times(L3+L4)$

$S_2 = (H_o+0.0414)\times2\times(L3+L4)$

$S_3 = (0.3H_o + 0.045 + 0.15B_o + 0.01)\times(1+1.118)$

109 Reinforcing bars

(or/08) ∇(No.10) $\times$ 60 (kg/m³)

110 Rubber joint filler.

(or/09) $0.35 \times 1.118 (H_o+0.15) \times 2$

$= 0.783 (H_o+0.65)$

Work division: No. 3.2 Concrete Canal / Cross Drain : Side ditch and Cross Drain

Package 1

Item No.	Discription		Total	Kamal main								
				Side ditch							Cross drain	
				Stage1	Stage2			Stage3			Stage2	Stage3
				Left	Total	Left	Right	Total	Left	Right	Right	Right
	Length of side ditch/cross drain	lin.m		420.3	3,556.5	1,356.7	2,199.8	717.7	102.1	615.6	4.0	4.0
	Size of precast side dith	m		0.4		0.4	0.4		0.4	0.4		
/ 02	Trench excavation	cu.m	1,164.2	104.2	882.0	336.5	545.6	178.0	25.3	152.7		
/ 03	Backfilling with excavated materials	cu.m	225.3	20.2	170.7	65.1	105.6	34.4	4.9	29.5		
/ 05	Gravel bedding	cu.m	191.2	16.8	142.3	54.3	88.0	28.7	4.1	24.6	1.7	1.7
/ 11	Precast concrete culvert, 400x400mm	lin.m	8.0								4.0	4.0
/ 12	Precast concrete side ditch, U-type, 400x400mm	lin.m	4,694.5	420.3	3,556.5	1,356.7	2,199.8	717.7	102.1	615.6		
/ 13	Precast concrete side ditch, L-type, 300x300mm	lin.m										

CC-4

Work division: No. 3.2 Concrete Canal / Cross Drain : Side ditch and Cross Drain

Package 2

Item No.	Discription		Tanjungan				PIK	
			Side ditch		Side ditch		Side ditch	Cross drain
			Left		Right		Right	Right
	Length of side ditch	lin.m	487.7	189.5	200.3	137.6	319.1	8.0
	Size of precast side dith	m	0.4	0.4	0.4	0.4	0.3	
/ 02	Trench excavation	cu.m	120.9	47.0	49.7	34.1	46.9	
/ 03	Backfilling with excavated materials	cu.m	23.4	9.1	9.6	6.6	8.6	
/ 04	Gravel bedding	cu.m	19.5	7.6	8.0	5.5	9.6	3.4
/ 05	Precast concrete culvert, 400x400mm	lin.m						8.0
/ 06	Precast concrete side ditch, U-type, 400x400mm	lin.m	487.7	189.5	200.3	137.6		
/ 07	Precast concrete side ditch, L-type, 300x300mm	lin.m					319.1	

Work division: No. 3.2 Concrete Canal / Cross Drain : Side ditch and Cross Drain

Package 3

Item No.	Discription		Gede/Bor			S. Cengkareng			
			Side ditch		Cross drain	Side ditch		Cross drain	
			Left	Right	Right	Left	Right	Left	Right
	Length of side ditch	lin.m	305.0	1,174.7	19.0	3,801.2	4,057.8	12.0	15.0
	Size of precast side dith	m	0.4	0.4		0.4	0.4		
/ 02	Trench excavation	cu.m	75.6	291.3		942.7	1,006.3		
/ 03	Backfilling with excavated materials	cu.m	14.6	56.4		182.5	194.8		
/ 04	Gravel bedding	cu.m	12.2	47.0	8.2	152.0	162.3	5.2	6.5
/ 09	Precast concrete culvert, 400x400mm	lin.m			19.0			12.0	15.0
/ 10	Precast concrete side ditch, U-type, 400x400mm	lin.m	305.0	1,174.7		3,801.2	4,057.8		

Work division: No. 3.2 Concrete Canal / Cross I: Culvert

Package 1

Item No.	Discription		Kamal branch	
			Left CKE-1L	Right CKE-1R
	Height of drain ditch : H0	m	0.6	0.8
	Width of culvert : B0	m	0.6	0.8
	Length of culvert : L4	m	0.768	0.874
	L5	m	7.100	7.100
/ 02	Trench excavation	cu.m	21.263	29.603
/ 03	Backfilling with excavated materials	cu.m	10.405	14.533
/ 06	Concrete, type 4	cu.m	6.162	7.721
/ 07	Concrete, type 5, for leveling	cu.m	0.944	1.116
/ 08	Form, type F1, for Item No. 3.2/07	sq.m	32.327	40.783
/ 09	Reinforcing bars, for Item No. 3.2/07	kg	369.737	463.267
/ 10	Rubber joint filler, t =10 mm	sq.m	0.979	1.135

Work division: No. 3.2 Concrete Canal / Cross I: Drain ditch

Package 1

Item No.	Discription		Kamal branch	
			Left	
			DKE-1L	DKE-2L
	Height of drain ditch : H0	m	0.8	0.6
	Width of culvert : B0	m	0.8	0.6
	Length of culvert : L3	m	0.758	0.753
	L4	m	3.000	1.000
/ 02	Trench excavation	cu.m	9.273	2.906
/ 03	Backfilling with excavated materials	cu.m	4.143	1.267
/ 06	Concrete, type 4	cu.m	1.560	0.570
/ 07	Concrete, type 5, for leveling	cu.m	0.489	0.193
/ 08	Form, type F1, for Item No. 3.2/06	sq.m	14.343	5.567
/ 09	Reinforcing bars, for Item No. 3.2/06	kg	93.574	34.184
/ 10	Rubber joint filler, t =10 mm	sq.m	1.135	0.979

Work division: No. 3.2 Concrete Canal / Cross I : Drain ditch

Package 3

Item No.	Discription		Gede / Bor Right DGM-2R
	Height of drain ditch : H0	m	0.8
	Width of culvert : B0	m	0.6
	Length of culvert : L3	m	0.989
	L4	m	1.000
/ 02	Trench excavation	cu.m	4.490
/ 03	Backfilling with excavated materials	cu.m	2.193
/ 05	Concrete, type 4	cu.m	0.766
/ 06	Concrete, type 5, for leveling	cu.m	0.219
/ 07	Form, type F1, for Item No. 3.2/05	sq.m	7.942
/ 08	Reinforcing bars, for Item No. 3.2/05	kg	45.946
/ 09	Rubber joint filler, t =10 mm	sq.m	1.135

1.3.3 Metal Works

Weight Table of Gate

	No.	Size (m x m)	Nos. of gate	Weight (kg)				
				Gate leaf	Guide frame	Hoist	Weight / one gate	Total Weight
Slide Gate								
Package 1								
Kamal drainage channel (Main channel)								
Left	SKM-1L	1.2 x 1.2	1	207	383	147		737
	SKM-2L	1.1 x 1.1	1	188	357	142		687
	SKM-3L	1.5 x 1.3	1	272	418	160		850
	SKM-4L	0.8 x 0.8	1	113	326	131		570
	SKM-5L	1.0 x 1.0	1	162	334	136		632
	SKM-6L	1.0 x 1.0	1	162	326	135		623
	SKM-7L	0.7 x 0.7	1	92	276	122		490
	SKM-8L	1.0 x 1.0	1	162	329	135		626
Right	SKM-1R	1.1 x 1.1	2	188	357	142	686	1374
	SKM-2R	1.2 x 1.2	1	207	383	147		737
	SKM-3R	1.3 x 1.3	1	250	409	153		812
	SKM-4R	0.8 x 0.8	1	113	315	129		557
	SKM-5R	0.8 x 0.8	1	113	310	129		552
	SKM-6R	0.8 x 0.8	1	113	306	128		547
	SKM-7R	1.0 x 1.0	1	162	329	135		626
Kamal drainage channel (Branch channel)								
Left	SKE-1L	0.8 x 0.8	1	113	277	125		515
	SKE-4L	0.8 x 0.8	1	113	277	125		515
Right	SKE-1R	0.8 x 0.8	1	113	252	123		488
	SKE-2R	0.9 x 0.9	1	130	303	130		563
Package 2								
Tanjungan drainage channel								
Left	STM-1L	0.8 x 0.8	1	113	284	126		523
	STM-2L	1.0 x 1.0	2	162	329	138	626	1258
	STM-3L	0.8 x 0.8	1	113	285	126		524
	STM-4L	1.0 x 1.0	1	162	329	135		626
Right	STM-1R	0.8 x 0.8	1	113	284	126		523
	STM-3R	0.8 x 0.8	1	113	287	126		526
PIK Junction drainage channel								
Right	SNM-1R	1.1 x 1.1	1	188	357	142		687

Weight Table of Gate

	No.	Size (m x m)	Nos. of gate	Weight (kg)				
				Gate leaf	Guide frame	Hoist	Weight / one gate	Total Weight
Slide Gate								
Package 3								
Saluran Cengkareng drainage channel								
	Salurang Cengkareng Outlet Gate	2.3 x 2.3	5	919	576	288		8915
Left	SCM-1L	1.3 x 1.3	1	250	409	153		812
	SCM-2L	1.2 x 1.2	2	207	383	147	736	1474
	SCM-3L	1.0 x 1.0	1	162	353	138		653
	SCM-4L	1.1 x 1.1	1	188	355	142		685
	SCM-5L	1.0 x 1.0	1	162	326	135		623
	SCM-6L	1.1 x 1.1	1	188	357	142		687
	SCM-7L	1.1 x 1.1	1	188	357	142		687
	SCM-8L	0.9 x 0.9	1	130	322	132		584
Right	SCM-1R	1.2 x 1.2	1	207	384	147		737
	SCM-2R	1.2 x 1.2	1	207	383	147		737
	SCM-3R	1.0 x 1.0	1	162	347	140		649
	SCM-4R	1.0 x 1.0	1	162	345	137		644
	SCM-5R	1.0 x 1.0	1	162	342	137		641
	SCM-6R	1.1 x 1.1	1	188	357	142		687
	SCM-7R	0.8 x 0.8	1	113	317	129		559
Gede/Bor drainage channel								
Left	SGM-1L	0.8 x 0.8	1	113	299	128		540
	SGM-2L	1.0 x 1.0	2	162	376	140	677	1354
	SGM-5L	0.8 x 0.8	1	113	296	128		537
Right	SGM-1R	0.8 x 0.8	1	113	282	126		521
	SGM-2R	0.8 x 0.8	1	113	299	128		540
Grand total (Slide Gate)								40434
Flap Gate								
Package 1								
Kamal drainage channel (Branch channel)								
Left	SKE-2L	0.4 x 0.4	1	31	33			64
	SKE-3L	0.4 x 0.4	1	31	33			64
	SKE-4L	0.4 x 0.4	1	31	33			64
Right	SKE-3R	0.4 x 0.4	1	31	33			64
Package 2								
Tanjungan drainage channel								
Right	STM-2R	0.4 x 0.4	1	31	33			64
Grand total (Flap Gate)								320

Weight Table of Stoplog

Gate size	Q* ty	Gate leaf	Guide frame	Total weight(kg)
0.4×0.4	5	51	5×37=185	236
0.7×0.7	1	99	44	143
0.8×0.8	16	137	16×52=832	969
0.9×0.9	2	150	2×52=104	254
1.0×1.0	14	195	14×60=840	1035
1.1×1.1	8	211	8×60=480	691
1.2×1.2	6	264	6×67=402	666
1.3×1.3	2	282	2×67=134	416
1.5×1.3	1	319	67	386
2.3×2.7	5	1190	5×117 =585	1775
2.3×3.4	5	1446	5×143 =715	2161
Total		4344	4388	8732

Weight Table of Trashrack

Size (m)	Q* ty	Trashrack panel	Embeded metal	Total weight(kg)
10.0×2.403	3 set	3×1345=4035	3×110=330	4365

Weight Table of Mesh cover

Size (m)	Q* ty	Mesh cover panel	Anchor bolt	Total weight(kg)
2.0×3.5	3 sets	3×90=270	3×5=15	285
10.0×380	570 sets	51300	2850	54150