Table 4.1.5 (16/23) CALCULATION SHEET FOR FOUNDATION WORKS

ID No.	Working Name	Calculation Quantity	Remarks
CW-3-16	Wale Work-A	10 m	Using C-Channel Steel

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
		Truck Crane; 22 ton, Oil									
	A-2-1-73	Pressure	hourly	3	154,913	1,032	131,788	464,738	3,096	395,363	
	A-2-1-38	Crawler Crane; 22.5 ton	hourly	3	153115.4	804	138527.4	459,346	2,412	415,582	
		Shotcrete Machine Wet Type :									
	A-2-2-58	0.8~1.2	hourly	0.7	68498.33	0	40476.29	47,949	0	28,333	
Labour											
	L-2-6	Welder	day	1.8	0	0	39000	0	0	70,200	
	L-2-13	Rigger	day	0.7	0	0	39000	0	0	27,300	
	L-2-23	Common Labour	day	2.1	0	0	35100	0	0	73,710	
Material											
	M-E-78	C-beam (Purchasing), SS41	kg	50	5225	0	275	261,250	0	13,750	
		Structural Steel(Purchasing),									
	M-E-4	SS41	kg	20	5225	0	275	104,500	0	5,500	
	M-E-36	Bolt and Nut	kg	5	0	12375	28875	0	61,875	144,375	
Others											
		Tools	%	15				200,667	10,107	176,117	
		Miscellaneous	L.S.					50	10	70	
Total for	10 m							1,538,500	77,500	1,350,300	
Unit Cost for	1 m							153,850	7,750	135,030	
Unit Cost for	1 kg	of C-Channel Steel						30,770	1,550	27,006	

*1	All composition numbers are quated from Japanese Standard.					
*2	C-Channel Steel Weight	500 kg/total	/	10 m/total	x 10 m =	50 kg/10m
*3	Structural Steel	200 kg/total	/	10 m/total	x 10 m =	20 kg/10m
*4	Bolt and Nut	50 kg/total	/	10 m/total	x 10 m =	5 kg/10m

ID No.	Working Name	Calculation Quantity	Remarks
CW-3-17	Wale Work-B (Temporary)	2 ton	Using C-Channel Steel

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
		Truck Crane; 22 ton, Oil									
	A-2-1-73	Pressure	hourly	3	154,913	1,032	131,788	464,738	3,096	395,363	
	A-2-1-38	Crawler Crane; 22.5 ton	hourly	3	153115.4	804	138527.4	459,346	2,412	415,582	
		Shotcrete Machine Wet Type :									
	A-2-2-58	0.8~1.2	hourly	0.7	68498.33	0	40476.29	47,949	0	28,333	
Labour											
	L-2-6	Welder	day	1.8	0	0	39000	0	0	70,200	
	L-2-13	Rigger	day	0.7	0	0	39000	0	0	27,300	
	L-2-23	Common Labour	day	2.1	0	0	35100	0	0	73,710	
Others											
		Tools	%	15				145,805	826	151,573	
		Miscellaneous	L.S.					63	66	38	
Total for	2 ton							1,117,900	6,400	1,162,100	
Unit Cost for	1 ton							558,950	3,200	581,050	

*1	All composition numbers are quated from Japanese Standard.					
*2	C-Channel Steel Weight	15000 kg/total	/	10 m/total	x 10 m =	1,500 kg/10m
*3	Structural Steel	3000 kg/total	/	10 m/total	x 10 m =	300 kg/10m
*4	Bolt and Nut	100 kg/total	/	10 m/total	x 10 m =	10 kg/10m

Table 4.1.5 (17/23) CALCULATION SHEET FOR FOUNDATION WORKS

ID No.	Working Name	Calculation Quantity	Remarks
CW-3-18	Installation of Tie Rod-A	10 set	for Concrete Sheet Pile

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-1-73	Truck Crane; 22 ton, Oil Pressure	hourly	2	154,913	1,032	131,788	309,825	2,064	263,575	
Labour											
	L-2-13	Rigger	day	1.5	0	0	39000	0	0	58,500	
	L-2-23	Common Labour	day	5	0	0	35100	0	0	175,500	
Material											
	M-E-13	Tierod (Purchasing)	kg	25	47500	0	2500	1,187,500	0	62,500	
Others											
		Tools	%	15				224,599	310	84,011	
		Miscellaneous	L.S.					76	26	14	
Total for	10 set							1,722,000	2,400	644,100	
Unit Cost for	1 set							172,200	240	64,410	
Unit Cost for	1 kg		of Tie Rod					68,880	96	25,764	

*1 All composition numbers are quated from Japanese Standard.

*2 Tierod 500 kg/total / 200 set/total x 10 set = 25 kg/10set

ID No.	Working Name	Calculation Quantity	Remarks
CW-3-19	Installation of Tie Rod-B (Temporary)	10 set	for Temporary Structure

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-1-73	Truck Crane; 22 ton, Oil Pressure	hourly	2	154,913	1,032	131,788	309,825	2,064	263,575	
Labour											
	L-2-13	Rigger	day	1.5	0	0	39000	0	0	58,500	
	L-2-23	Common Labour	day	5	0	0	35100	0	0	175,500	
Material											
	M-E-12	Tierod (Lease)	kg day	3	60	0	40	150	0	100	
Others											
		Tools	%	15				46,496	310	74,651	
		Miscellaneous	L.S.					29	26	74	
Total for	10 set							356,500	2,400	572,400	
Unit Cost for	1 set							35,650	240	57,240	
Unit Cost for	1 kg		of Tie Rod					142,600	960	228,960	

*1 All composition numbers are quated from Japanese Standard.

*2 Tierod 500 kg/total / 200 set/total x 10 set = 3 kg/10set

Table 4.1.5 (18/23) CALCULATION SHEET FOR FOUNDATION WORKS

ID No.	Working Name		Calculation Quantity	Remarks
CW-3-20	Pulling Out of Concrete Sheet Pile (t=22)		100 m	L=10m long
	Kind of Pile	Concrete Sheet Pile	2	1. Steel Sheet Pile, 2. Concrete Sheet Pile
	Driving Direction	Pulling Out	2	1. Driving In, 2. Pulling Out
	Type of Sheet Pile	Concrete Sheet Pile	4	1. Steel Sheet Type-II, 2. Type-III, 3. Type-IV, 4. Concrete Sheet Pile
	Soil Condition	Mainly Sand or Gravel	2	1. Mainly Silt or Clay, 2. Mainly Sand or Gravel
	Using Machine	Vibrating Hammer 60kw	40003	1~4 21 11~13,21~23 3005
	Width	500 mm		201 101~103, 201=203
	Thickness of Material	220 mm	t	480836060
	Length of Driving	6 meter		24040
	Length of Sheet Pile	6 meter		168852663
	Crawler Crane	40t		
	Truck Crane	22t		
	Generator	200kVA		
	Working Condition	there is no obstacle	2	(f1) : 1. Obstacle Structure for construction are situated 2. Nothing
		Working space is limited	1	(f2) : 1. Working space is limited, 2. Working space is enough
	(total number of driving piles is	more than 300	3	(f3) : Construction scale, number of piles is ; 1.less than 100, 2.100~300, 3 more than 300
	Other	with Truck Crane	1	1. With Truck Crane 2. No Truck Crane

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-1-87	Vibrating Hammer; 60 kW	hourly	14.60	150,191	0	91,875	2,192,788	0	1,341,376	
	A-2-1-41	Crawler Crane; 40 ton	hourly	14.60	279,714	1,080	251,509	4,083,818	15,768	3,672,030	
	A-2-2-19	Generator; 200 kVA	daily	2.12	415,060	23,760	321,895	878,243	50,275	681,110	
	A-2-1-73	Truck Crane; 22 ton, Oil Pressure	hourly	8.76	154,913	1,032	131,788	1,357,034	9,040	1,154,459	
Labour											
	L-2-1	Foreman	day	2.12	0	0	48800	0	0	103,258	
	L-2-13	Rigger	day	4.23	0	0	39000	0	0	165,043	
	L-2-23	Common Labour	day	2.12	0	0	35100	0	0	74,270	
Others											
		Miscellaneous	L.S.					18	17	54	
Total for		100 m						8,511,900	75,100	7,191,600	
Unit Cost for		1 m						85,119	751	71,916	

Condition of Soil Mechanics

Depth (m)	N-value
1	10
2	10
3	10
4	15
5	10
6	10
7	
8	
9	
10	
11	
12	
13	
14	
15	
Max	15

Driving or Pulling Time /piece (minutes) Tc

Where,
- α : Coefficient for Driving or Pulling = 2.8 from Table 4.1.7-D
- γ : Coefficient for Driving or Pulling = 0 from Table 4.1.7-D
- l : Length of Driving or Pulling (m) = 6
- Nmax : Maximum N-value of Soil = 15
- K : Coefficient for Material and Equipment = 1.2 from Table 4.1.7-D

Coefficient for Working F

$$F = f0 + f1 + f2 + f3$$

Where,
- f0 : Base Coefficient = 1
- f1 : Obstacle Condition by Structure = 0 from Table 4.1.7-E
- f2 : Condition by Space for Construction = -0.05
- f3 : Condition of Scale by Number of Piling = 0.05

F : Coefficient for Working = 1

Hence, Tc = 8.76 minutes/piece

Production Rate

Working Time for Driving or Pulling /piece (minutes) : Tc

$$Tc = \frac{\{0.75 + \gamma \times Nmax) \times l + \alpha\} \times K}{F}$$

Where,
- α, γ : Coefficient for Driving or Pulling
- l : Length of Driving or Pulling (m)
- Nmax : Maximum N-value of Soil
- K : Coefficient for Material and Equipment
- F : Coefficient for Working

Material		Foreman	Rigger		Common
Concrete Sheet Pile		1	2		1

*1 100piece x $\frac{Tc}{T \times 60}$ x Composition of Manpower = Foreman 2.12, Rigger 4.23, Common 2.12

*2 100piece x $\frac{Tc}{60}$ = Vibrating Hammer 60kw And Crawler Crane 14.60 hour

*3 100piece x $\frac{Tc}{T \times 60}$ = Generator 2.12

*4 100piece x $\frac{Tc}{T \times 60}$ = Truck Crane 8.76

*5 Truck Crane Working Time / Piling Working Time = 60 %

*6 Average Daily Working Time of Generator, Labor $T = \frac{690}{100} = 6.9$ (hour/day)

Table 4.1.5 (19/23) CALCULATION SHEET FOR FOUNDATION WORKS

ID No.	Working Name		Calculation Quantity	Remarks
CW-3-21	Driving In of H-Beam		10 piece	Driving 6m long
	Kind of Pile	H Beam	4	1. Steel Sheet Pile, 2. Concrete Sheet Pile, 3. Log Pile, 4. H-Beam
	Driving Direction	Driving In	1	1. Driving In, 2. Pulling Out
	Type of Sheet Pile		0 0	1. Steel Sheet Type-II, 2. Type-III, 3. Type-IV, 4. Concrete Sheet Pile
	Soil Condition	Mainly Sand or Gravel	2	1. Mainly Silt or Clay, 2. Mainly Sand or Gravel
	Using Machine	Vibrating Hammer 30kw	30003 1~4	21 11~13,21~23 1005
	Width	300 mm		201 101~103, 201~203
	Thickness of Material	400 mm	1	0
	Length of Driving	6 meter		0
	Length of Sheet Pile	12 meter		126642663
	Crawler Crane	37t		
	Generator	100kVA		
	Working Condition	there are obstacles	1	(f1) : 1. Obstacle Structure for construction are situated 2. Nothing
		Working space is limited	1	(f2) : 1. Working space is limited, 2. Working space is enough
	(total number of driving piles is	less than100	1	(f3) : Construction scale, number of piles is ; 1.less than 100, 2.100~300, 3 more than 300
	Other	with Truck Crane	1	1. With Truck Crane 2. No Truck Crane

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-1-85	Vibrating Hammer; 30 kW	hourly	1.98	86,428	0	52,870	170,839	0	104,506	
	A-2-1-71	Truck Crane; 11(10) ton, Oil Pressure	hourly	1.19	99,322	1,020	85,929	117,796	1,210	101,912	
	A-2-1-7	Backhoe; 0.6 m3	hourly	1.98	125,543	2,040	90,965	248,156	4,032	179,808	
	A-2-2-15	Generator; 100 kVA	daily	0.29	215,064	10,800	160,745	61,610	3,094	46,049	
Labour											
	L-2-1	Foreman	day	0.29	0	0	48800	0	0	13,980	
	L-2-13	Rigger	day	0.29	0	0	39000	0	0	11,172	
	L-2-23	Common Labour	day	0.57	0	0	35100	0	0	20,110	
Total for		10 piece						598,401	8,336	477,537	
Unit Cost for		1 piece						59,840	834	47,754	

Condition of Soil Mechanics

Depth (m)	N-value
1	7
2	7
3	10
4	10
5	10
6	10
7	
8	
9	
10	
11	
12	
13	
14	
15	
Max	10

Driving or Pulling Time /piece (minutes) Te

Where,
- α : Coefficient for Driving or Pulling = 3.38 from Table 4.1.7-D
- γ : Coefficient for Driving or Pulling = 0.02 from Table 4.1.7-D
- l : Length of Driving or Pulling (m) = 6
- Nmax : Maximum N-value of Soil = 10
- K : Coefficient for Material and Equipment = 1.11 from Table 4.1.7-D

Coefficient for Working F

F = f0 + f1 + f2 + f3

Where,
- f0 : Base Coefficient = 1
- f1 : Obstacle Condition by Structure = -0.05 from Table 4.1.7-E
- f2 : Condition by Space for Construction = -0.05
- f3 : Condition of Scale by Number of Piling = -0.05

F : Coefficient for Working = 0.85

Hence, Te = 11.86 minutes/piece

Production Rate

Working Time for Driving or Pulling /piece (mimutes) : Te

$$Te = \frac{\{(0.75 + \gamma \times Nmax) \times l + \alpha\} \times K}{F}$$

Where,
- α, γ : Coefficient for Driving or Pulling
- l : Length of Driving or Pulling (m)
- Nmax : Maximum N-value of Soil
- K : Coefficient for Material and Equipment
- F : Coefficient for Working

Material		Foreman	Rigger		Common
Concrete Sheet Pile		1	1		2

*1 10piece x $\frac{Te}{T \times 60}$ x Composition of Manpower = Foreman 0.29, Rigger 0.29, Common 0.57

*2 10piece x $\frac{Te}{60}$ = Vibrating Hammer 30kw And Crawler Crane 1.98 hour

*3 10piece x $\frac{Te}{T \times 60}$ = Generator 0.29

*4 10piece x $\frac{Te}{T \times 60}$ = Truck Crane 1.19

*5 Truck Crane Working Time / Piling Working Time = 60 %

*6 Average Daily Working Time of Generator, Labor

$$T = \frac{690}{100} = 6.9 \text{ (hour/day)}$$

Table 4.1.5 (20/23) CALCULATION SHEET FOR FOUNDATION WORKS

ID No.	Working Name		Calculation Quantity	Remarks
CW-3-22	Pulling out of H-Beam		10 piece	Driving 6m long
	Kind of Pile	H Beam	4	1. Steel Sheet Pile, 2. Concrete Sheet Pile, 3. Log Pile, 4. H-Beam
	Driving Direction	Pulling Out	2	1. Driving In, 2. Pulling Out
	Type of Sheet Pile		0 0	1. Steel Sheet Type-II, 2. Type-III, 3. Type-IV, 4. Concrete Sheet Pile
	Soil Condition	Mainly Sand or Gravel	2	1. Mainly Silt or Clay, 2. Mainly Sand or Gravel
	Using Machine	Vibrating Hammer 30kw	40003 1~4	21 11~13,21~23 1005
	Width	300 mm		201 101~103, 201~203
	Thickness of Material	400 mm	1	0
	Length of Driving	6 meter		0
	Length of Sheet Pile	12 meter		168852663
	Crawler Crane	37t		
	Generator	100kVA		
	Working Condition	there are obstacles	1	(f1) : 1. Obstacle Structure for construction are situated 2. Nothing
		Working space is limited	1	(f2) : 1. Working space is limited, 2. Working space is enough
	(total number of driving piles is	less than100	1	(f3) : Construction scale, number of piles is ; 1.less than 100, 2.100~300, 3 more than 300
	Other	with Truck Crane	1	1. With Truck Crane 2. No Truck Crane

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-1-85	Vibrating Hammer; 30 kW	hourly	1.72	86,428	0	52,870	148,224	0	90,672	
	A-2-1-71	Truck Crane; 11(10) ton, Oil Pressure	hourly	1.03	99,322	1,020	85,929	102,202	1,050	88,421	
	A-2-1-7	Backhoe; 0.6 m3	hourly	1.72	125,543	2,040	90,965	215,306	3,499	156,005	
	A-2-2-15	Generator; 100 kVA	daily	0.25	215,064	10,800	160,745	53,454	2,684	39,953	
Labour											
	L-2-1	Foreman	day	0.25	0	0	48800	0	0	12,129	
	L-2-13	Rigger	day	0.25	0	0	39000	0	0	9,693	
	L-2-23	Common Labour	day	0.50	0	0	35100	0	0	17,448	
Total for		10 piece						519,186	7,233	414,322	
Unit Cost for		1 piece						51,919	723	41,432	

Condition of Soil Mechanics

Depth (m)	N-value
1	7
2	7
3	10
4	10
5	10
6	10
7	
8	
9	
10	
11	
12	
13	
14	
15	
Max	10

Driving or Pulling Time /piece (minutes) Tc

Where,
- α : Coefficient for Driving or Pulling = 3.38 from Table 4.1.6-D
- γ : Coefficient for Driving or Pulling = 0 from Table 4.1.6-D
- l : Length of Driving or Pulling (m) = 6
- Nmax : Maximum N-value of Soil = 10
- K : Coefficient for Material and Equipment = 1.11 from Table 4.1.6-D

Coefficient for Working F

F = f0 + f1 + f2 + f3

Where,
- f0 : Base Coefficient = 1
- f1 : Obstacle Condition by Structure = -0.05 from Table 4.1.6-E
- f2 : Condition by Space for Construction = -0.05
- f3 : Condition of Scale by Number of Piling = -0.05

F : Coefficient for Working = 0.85

Hence, Tc = 10.29 minutes/piece

Production Rate

Working Time for Driving or Pulling /piece (minutes) : Tc

$$Tc = \frac{\{(0.75 + \gamma \times Nmax) \times l + \alpha\} \times K}{F}$$

Where,
- α, γ : Coefficient for Driving or Pulling
- l : Length of Driving or Pulling (m)
- Nmax : Maximum N-value of Soil
- K : Coefficient for Material and Equipment
- F : Coefficient for Working

Material		Foreman	Rigger		Common
Concrete Sheet Pile		1	1		2

*1 10piece x $\frac{Tc}{T \times 60}$ x Composition of Manpower = Foreman 0.25, Rigger 0.25, Common 0.50

*2 10piece x $\frac{Tc}{60}$ = Vibrating Hammer 30kw And Crawler Crane 1.72 hour

*3 10piece x $\frac{Tc}{T \times 60}$ = Generator 0.25

*4 10piece x $\frac{Tc}{T \times 60}$ = Truck Crane 1.03

*5 Truck Crane Working Time / Piling Working Time = 60 %

*6 Average Daily Working Time of Generator, Labor $T = \frac{690}{100} = 6.9$ (hour/day)

Table 4.1.5 (21/23) CALCULATION SHEET FOR FOUNDATION WORKS

ID No.	Working Name		Calculation Quantity	Remarks
CW-3-23	Driving In of Log Pile L=3.0m		10 piece	L=3m long
	Kind of Pile	Log Pile	3	1. Steel Sheet Pile, 2. Concrete Sheet Pile, 3. Log Pile
	Driving Direction	Driving In	1	1. Driving In, 2. Pulling Out
	Type of Sheet Pile		0	1. Steel Sheet Type-II, 2. Type-III, 3. Type-IV, 4. Concrete Sheet Pile
	Soil Condition	Mainly Sand or Gravel	2	1. Mainly Silt or Clay, 2. Mainly Sand or Gravel
	Using Machine	Vibrating Hammer 30kw	30003 1~4	21 11~13,21~23 1005
	Width	150 mm		201 101~103, 201~203
	Thickness of Material	150 mm	1	0
	Length of Driving	3 meter		0
	Length of Sheet Pile	3 meter		126642663
	Backhoe	0.6m3		
	Generator	100kVA		
	Working Condition	there are obstacles	1	(f1) : 1. Obstacle Structure for construction are situated 2. Nothing
		Working space is limited	1	(f2) : 1. Working space is limited, 2. Working space is enough
	(total number of driving piles is	more than 300	3	(f3) : Construction scale, number of piles is ; 1.less than 100, 2.100~300, 3 more than 300
	Other	No Truck Crane	2	1. With Truck Crane 2. No Truck Crane

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-1-85	Vibrating Hammer; 30 kW	hourly	1.21	86,428	0	52,870	104,866	0	64,149	
	A-2-1-7	Backhoe; 0.6 m3	hourly	1.21	125,543	2,040	90,965	152,325	2,475	110,371	
	A-2-2-15	Generator; 100 kVA	daily	0.18	215,064	10,800	160,745	37,818	1,899	28,266	
Labour											
	L-2-1	Foreman	day	0.18	0	0	48800	0	0	8,581	
	L-2-13	Rigger	day	0.00	0	0	39000	0	0	0	
	L-2-23	Common Labour	day	0.35	0	0	35100	0	0	12,344	
Total for		10 piece						295,009	4,374	223,711	
Unit Cost for		1 piece						29,501	437	22,371	

Condition of Soil Mechanics

Depth (m)	N-value
1	7
2	7
3	10
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
Max	10

Driving or Pulling Time /piece (minutes) Tc

Where,
- α : Coefficient for Driving or Pulling = 3.38 from Table 4.1.7-D
- γ : Coefficient for Driving or Pulling = 0.02 from Table 4.1.7-D
- l : Length of Driving or Pulling (m) = 3
- Nmax : Maximum N-value of Soil = 10
- K : Coefficient for Material and Equipment = 1.11 from Table 4.1.7-D

Coefficient for Working F

F = f0 + f1 + f2 + f3

Where,
- f0 : Base Coefficient = 1
- f1 : Obstacle Condition by Structure = -0.05 from Table 4.1.7-E
- f2 : Condition by Space for Construction = -0.05
- f3 : Condition of Scale by Number of Piling = 0.05

F : Coefficient for Working = 0.95

Hence, Tc = 7.28 minutes/piece

Production Rate

Working Time for Driving or Pulling /piece (minutes) : Tc

$$Tc = \frac{\{(0.75 + \gamma \times Nmax) \times l + \alpha\} \times K}{F}$$

Where,
- α, γ : Coefficient for Driving or Pulling
- l : Length of Driving or Pulling (m)
- Nmax : Maximum N-value of Soil
- K : Coefficient for Material and Equipment
- F : Coefficient for Working

Material		Foreman	Rigger		Common
Concrete Sheet Pile		1	0		2

*1 10piece x $\frac{Tc}{T \times 60}$ x Composition of Manpower = Foreman 0.18, Rigger 0.00, Common 0.35

*2 10piece x $\frac{Tc}{60}$ = Vibrating Hammer 30kw And Crawler Crane 1.21 hour

*3 10piece x $\frac{Tc}{T \times 60}$ = Generator 0.18

*4 10piece x $\frac{Tc}{T \times 60}$ = Truck Crane 0.73

*5 Truck Crane Working Time / Piling Working Time = 60 %

*6 Average Daily Working Time of Generator, Labor $T = \frac{690}{100} = 6.9$ (hour/day)

Table 4.1.5 (22/23) CALCULATION SHEET FOR FOUNDATION WORKS

ID No.	Working Name		Calculation Quantity	Remarks
CW-3-24	Driving In of Log Pile L=4.0m		10 piece	L=4m long
	Kind of Pile	Log Pile	3	1. Steel Sheet Pile, 2. Concrete Sheet Pile, 3. Log Pile
	Driving Direction	Driving In	1	1. Driving In, 2. Pulling Out
	Type of Sheet Pile		0 0	1. Steel Sheet Type-II, 2. Type-III, 3. Type-IV, 4. Concrete Sheet Pile
	Soil Condition	Mainly Sand or Gravel	2	1. Mainly Silt or Clay, 2. Mainly Sand or Gravel
	Using Machine	Vibrating Hammer 30kw	30003 1~4	21 11~13,21~23 1005
	Width	150	mm	201 101~103, 201~203
	Thickness of Material	150	mm 1	0
	Length of Driving	4	meter	0
	Length of Sheet Pile	4	meter	126642663
	Backhoe	0.6m3		
	Generator	100kVA		
	Working Condition	there are obstacles	1	(f1) : 1. Obstacle Structure for construction are situated 2. Nothing
		Working space is limited	1	(f2) : 1. Working space is limited, 2. Working space is enough
	(total number of driving piles is	more than 300	3	(f3) : Construction scale, number of piles is ; 1.less than 100, 2.100~300, 3 more than 300
	Other	No Truck Crane	2	1. With Truck Crane 2. No Truck Crane

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-1-85	Vibrating Hammer; 30 kW	hourly	1.40	86,428	0	52,870	120,855	0	73,930	
	A-2-1-7	Backhoe; 0.6 m3	hourly	1.40	125,543	2,040	90,965	175,551	2,853	127,199	
	A-2-2-15	Generator; 100 kVA	daily	0.20	215,064	10,800	160,745	43,584	2,189	32,576	
Labour											
	L-2-1	Foreman	day	0.20	0	0	48800	0	0	9,890	
	L-2-13	Rigger	day	0.00	0	0	39000	0	0	0	
	L-2-23	Common Labour	day	0.41	0	0	35100	0	0	14,227	
Total for		10 piece						339,990	5,041	257,821	
Unit Cost for		1 piece						33,999	504	25,782	

Condition of Soil Mechanics

Depth (m)	N-value
1	7
2	7
3	10
4	10
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
Max	10

Driving or Pulling Time /piece (minutes) Tc

Where,
- α : Coefficient for Driving or Pulling = 3.38 from Table 4.1.7-D
- γ : Coefficient for Driving or Pulling = 0.02 from Table 4.1.7-D
- l : Length of Driving or Pulling (m) = 4
- Nmax : Maximum N-value of Soil = 10
- K : Coefficient for Material and Equipment = 1.11 from Table 4.1.7-D

Coefficient for Working F

$F = f0 + f1 + f2 + f3$

Where,
- f0 : Base Coefficient = 1
- f1 : Obstacle Condition by Structure = -0.05 from Table 4.1.7-E
- f2 : Condition by Space for Construction = -0.05
- f3 : Condition of Scale by Number of Piling = 0.05

F : Coefficient for Working = 0.95

Hence, Tc = 8.39 minutes/piece

Production Rate

Working Time for Driving or Pulling /piece (minutes) : Tc

$$Tc = \frac{\{(0.75 + \gamma \times Nmax) \times l + \alpha\} \times K}{F}$$

Where,
- α, γ : Coefficient for Driving or Pulling
- l : Length of Driving or Pulling (m)
- Nmax : Maximum N-value of Soil
- K : Coefficient for Material and Equipment
- F : Coefficient for Working

Material		Foreman	Rigger		Common
Log Pile		1	0		2

*1 10piece x $\frac{Tc}{T \times 60}$ x Composition of Manpower = Foreman 0.20, Rigger 0.00, Common 0.41

*2 10piece x $\frac{Tc}{60}$ = Vibrating Hammer 30kw And Crawler Crane 1.40 hour

*3 10piece x $\frac{Tc}{T \times 60}$ = Generator 0.20

*4 10piece x $\frac{Tc}{T \times 60}$ = Truck Crane 0.84

*5 Truck Crane Working Time / Piling Working Time = 60 %

*6 Average Daily Working Time of Generator, Labor $T = \frac{690}{100} = 6.9$ (hour/day)

Table 4.1.5 (23/23) CALCULATION SHEET FOR FOUNDATION WORKS

ID No.	Working Name		Calculation Quantity	Remarks
CW-3-25	Driving In of Log Pile L=5.0m		10 piece	L=5m long
	Kind of Pile	Log Pile	3	1. Steel Sheet Pile, 2. Concrete Sheet Pile, 3. Log Pile
	Driving Direction	Driving In	1	1. Driving In, 2. Pulling Out
	Type of Sheet Pile		0 0	1. Steel Sheet Type-II, 2. Type-III, 3. Type-IV, 4. Concrete Sheet Pile
	Soil Condition	Mainly Sand or Gravel	2	1. Mainly Silt or Clay, 2. Mainly Sand or Gravel
	Using Machine	Vibrating Hammer 30kw	30003 1-4 21 11-13,21-23	1005
	Width	150 mm	201 101-103, 201-203	
	Thickness of Material	150 mm	1	0
	Length of Driving	5 meter		0
	Length of Sheet Pile	5 meter		126642663
	Backhoe	0.6m3		
	Generator	100kVA		
	Working Condition	there are obstacles	1	(f1) : 1. Obstacle Structure for construction are situated 2. Nothing
		Working space is limited	1	(f2) : 1. Working space is limited, 2. Working space is enough
	(total number of driving piles is	more than 300	3	(f3) : Construction scale, number of piles is ; 1.less than 100, 2.100-300, 3 more than 300
	Other	No Truck Crane	2	1. With Truck Crane 2. No Truck Crane

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-1-85	Vibrating Hammer; 30 kW	hourly	1.58	86,428	0	52,870	136,844	0	83,710	
	A-2-1-7	Backhoe; 0.6 m3	hourly	1.58	125,543	2,040	90,965	198,776	3,230	144,028	
	A-2-2-15	Generator; 100 kVA	daily	0.23	215,064	10,800	160,745	49,350	2,478	36,886	
Labour											
	L-2-1	Foreman	day	0.23	0	0	48800	0	0	11,198	
	L-2-13	Rigger	day	0.23	0	0	39000	0	0	8,949	
	L-2-23	Common Labour	day	0.46	0	0	35100	0	0	16,109	
Total for		10 piece						384,971	5,708	300,880	
Unit Cost for		1 piece						38,497	571	30,088	

Condition of Soil Mechanics

Depth (m)	N-value
1	7
2	7
3	10
4	10
5	10
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
Max	10

Driving or Pulling Time /piece (minutes) Tc

Where,
- α : Coefficient for Driving or Pulling = 3.38 from Table 4.1.7-D
- γ : Coefficient for Driving or Pulling = 0.02 from Table 4.1.7-D
- l : Length of Driving or Pulling (m) = 5
- Nmax : Maximum N-value of Soil = 10
- K : Coefficient for Material and Equipment = 1.11 from Table 4.1.7-D

Coefficient for Working F

$F = f0 + f1 + f2 + f3$

Where,
- f0 : Base Coefficient = 1
- f1 : Obstacle Condition by Structure = -0.05 from Table 4.1.7-E
- f2 : Condition by Space for Construction = -0.05
- f3 : Condition of Scale by Number of Piling = 0.05

F : Coefficient for Working = 0.95

Hence, Tc = 9.5 minutes/piece

Production Rate

Working Time for Driving or Pulling /piece (minutes) : Tc

$$Tc = \frac{\{(0.75 + \gamma \times Nmax) \times l + \alpha\} \times K}{F}$$

Where,
- α, γ : Coefficient for Driving or Pulling
- l : Length of Driving or Pulling (m)
- Nmax : Maximum N-value of Soil
- K : Coefficient for Material and Equipment
- F : Coefficient for Working

Material		Foreman	Rigger		Common
Log Pile		1	1		2

*1 10piece x $\frac{Tc}{T \times 60}$ x Composition of Manpower = Foreman 0.23, Rigger 0.23, Common 0.46

*2 10piece x $\frac{Tc}{60}$ = Vibrating Hammer 30kw And Crawler Crane 1.58 hour

*3 10piece x $\frac{Tc}{T \times 60}$ = Generator 0.23

*4 10piece x $\frac{Tc}{T \times 60}$ = Truck Crane 0.95

*5 Truck Crane Working Time / Piling Working Time = 60 %

*6 Average Daily Working Time of Generator, Labor $T = \frac{690}{100} = 6.9$ (hour/day)

Table 4.1.6 WORKING COEFFICIENT FOR PILE DRIVING

Table 4.1.6 - A COEFFICIENT BY KINDS OF PILE (K)

Kind of Pile	Plumb Pile	Inclined Pile
Steel Pile	1	1.2
Concrete Pile	1.6	1.9

Table 4.1.6 - B COEFFICIENT BY SOIL MECHANICS (α)

	Range of N-value on Average				
	less than 5	5 ~ 10	10 ~20	20 ~30	equal or more than 30
Coefficient (α)	0.75	0.9	1	1.15	1.25

Table 4.1.6 - C COEFFICIENT BY HAMMER (β)

Diameter	Weight (t) for Diezel Pile Hammer						Weight(t) for Oil Pressure Pile Hammer				
(mm)	1.3	2.5	3.5	4.5	6	7.2	2	4~4.5	6.5	7~8	10~12.5
250	0.95	0.85	0.8				0.95	0.83	0.76		
300	1.01	0.91	0.85				0.99	0.88	0.81		
350	1.05	0.93	0.89	0.83			1.04	0.93	0.85	0.83	
400		0.97	0.93	0.87				0.97	0.89	0.86	
450		1	0.96	0.9	0.87			1.01	0.92	0.9	0.82
500		1.03	1	0.94	0.91			1.04	0.95	0.93	0.85
550		1.06	1.03	0.97	0.94						
600		1.09	1.06	0.99	0.96	0.93		1.1	1.01	0.98	0.89
700			1.11	1.05	1.02	0.98			1.05	1.02	0.93
800				1.09	1.06	1.02				1.06	0.97
900				1.14	1.1	1.07					1
1,000				1.18	1.14	1.11					1.03

Table 4.1.6 - D WELDING TIME FOR STEEL PILE (Tw)

Unit : minute by Arc Welding

Diameter	Thicknees of Steel (mm)					
(mm)	8	9	10	12	14	16
400	16	18	19	25	32	40
500	20	22	24	31	40	51
550	22	24	26	34	44	56
600	24	26	29	37	48	61
700	28	30	34	43	56	71
800	21	23	25	32	41	53
900	23	26	29	36	46	59
1000	26	29	31	40	51	66

Table 4.1.6 - E WELDING TIME FOR CONCRETE PILE (Tw)

Unit : minute by Arc Welding

Diameter	250	300	350	400	450	500	600	700	800
Time	12	13	15	17	18	19	22	24	26

Table 4.1.6 - F PREPARATION TIME BY MEASURES OF PILING (Tp)

unit : minute

	Preparation Time	
	Ordinary Measure	With Pincers
Plumb Pile	18	24
Plumb with soundproofed	23	34
Inclined Pile	19	26

Table 4.1.6 - G COEFFICIENT BY WORKING CONDITION (F)

Condition		Coefficient
Obstacle Condition by Structure (f1)	Situated	-0.05
	Nothing	0
Condition by Space for Construction (f2)	no Good	-0.05
	Ordinary	0
Condition of Scale by Number of Piling (f3)	less than 30 pieces	-0.05
	30 ~70	0
	more than 70	0.05

Table 4.1.6 - H MISCELLANEOUS PERCENTAGE

Unit : %

Kind of Pile	without Joint	One Joint	Two Joint	Three Joint
Steel Pile	1	5	6	9
Concrete Pile	1	4	5	

Table 4.1.6 - I COMPOSITION OF MANPOWER FOR PILING (MPC)

	Foreman	Rigger	Common Labor	Welder
Steel Pile	1	2	1	1
Concrete Pile	1	2	1	1

Table 4.1.7 WORKING COEFFICIENT FOR SHEET PILE DRIVING

Table 4.1.7 - A EQUIPMENT FOR PILLING OUT OF SHEET PILE

Type	Length of Pulling Out	Application
II	All	30
III or IV	~15m	40
	15m ~	60
Concrete Sheet Pile	All	40

Table 4.1.7 - B APPLICATION OF USING EQUIPMENT

Equipment	30kw	40kw	60kw
Crawler Crane	35~37t		40t
Truck Crane	20~22t		
Generator	100kVA	125kVA	200kVA

Table 4.1.7 - C COMPOSITION OF MANPOWER FOR PILING (MPC)

	Foreman	Rigger	Common Labor
Steel Sheet Pile	1	2	1
Concrete Sheet Pile	1	2	1

Table 4.1.7 - D COEFFICIENT FOR DRIVING OF SHEET PILE

		30kw		40kw		60kw	
		α	K	α	K	α	K
Type-II	Driving In	3.38	1.11	4.04	0.93	4.52	0.83
	Pulling Out	3.24					
Type-III	Driving In	2.82	1.33	3.38	1.11	3.75	1
	Pulling Out	2.71		3.24		3.6	
Type-IV	Driving In			3.18	1.18	3.57	1.05
	Pulling Out			3.05		3.43	
Concrete Sheet Pile	Driving In					3	1.2
	Pulling Out					2.8	
γ	Driving In	0.02					
	Pulling Out	0					

Table 4.1.7 - E COEFFICIENT BY WORKING CONDITION (F)

Condition		Coefficient
Obstacle Condition by Structure (f1)	Situated	-0.05
	Nothing	0
Condition by Space for Construction (f2)	no Good	-0.05
	Ordinary	0
Condition of Scale by Number of Piling (f3)	less than 30 pieces	-0.05
	30 ~70	0
	more than 70	0.05

Table 4.1.8 (1/9) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-1

ID No.	Working Name	Calculation Quantity	Remarks
CW-4-1	Temporary Bridge	215 m2	Width is 3m. Number of Working Day is 180 days including Installation and Removal

Major Item	ID No.	Description	Unit	Quantity	Unit Cost			Cost			Remarks
					PF/C	IF/C	L/C	PF/C	IF/C	L/C	
Equipment											
	A-2-1-82	Truck; 4 ton	hourly	60	37,005	876	37,451	2,220,301	52,560	2,247,060	
	A-2-1-13	Backhoe; 1 m3	hourly	195	196,104	3,360	142,785	38,240,186	655,200	27,843,086	
	A-2-1-85	Vibrating Hanumer; 30 kW	hourly	195	86,428	0	52,870	16,853,419	0	10,309,601	
	A-2-2-16	Generator; 125 kVA	daily	30	271,912	15,120	209,096	8,157,366	453,600	6,272,879	
	A-2-1-48	Dumptruck; 10 ton	hourly	210	77269	3060	70744.12	16,226,489	642,600	14,856,265	
	A-2-1-72	Truck Crane; 16 ton, Oil Pressur	hourly	195	135641.1	1020	115858.5	26,450,012	198,900	22,592,404	
Labour											
	L-2-32	Chief of Bridge	day	60	0	0	68300	0	0	4,098,000	
	L-2-16	Steel Worker	day	150	0	0	39000	0	0	5,850,000	
	L-2-33	Bridge Worker	day	150	0	0	58600	0	0	8,790,000	
	L-2-23	Common Labour	day	300	0	0	35100	0	0	10,530,000	
Material											
	M-E-2	Reinforcing Bar, Deformed U-30	kg	340	0	3000	3000	0	1,020,000	1,020,000	
	M-D-4	Timber	m3	20.45	0	0	850000	0	0	17,382,500	
	M-E-36	Bolt and Nut	kg	60.84	0	12375	28875	0	752,895	1,756,755	
	M-E-8	H-beam (Lease), SS41	kg day	3925800	18.11842	0	12.07895	71,129,297	0	47,419,532	21810kg x 180days
	M-D-12	Coconut Pile, Dia. 25cm, 10-12	nos.	78	0	0	55000	0	0	4,290,000	
Others											
		Miscellaneous	L.S.					17,927,729	377,645	18	10%
Total for	215	m2						197,204,800	4,153,400	185,258,100	
Unit Cost for	1	m2						917,232	19,318	861,666	
Unit Cost for	1	ton						8,878,764	186,999	8,340,887	

Table 4.1.8 (2/9) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-1

ID No. CW-4-2 | Working Name: Temporary Sign for Railway Work | Calculation Quantity: 1 unit | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-23	Common Labour	day	3	0	0	35100	0	0	105,300	
Material											
	M-M-14	Sign Lamp	nos.	2	0	50000	50000	0	100,000	100,000	
		Mterial for Flag	m2	1	0	0	10000	0	0	10,000	
	M-K-30	Wall Paint	kg	1	0	3750	8750	0	3,750	8,750	
	M-M-1	Triplex 1,220x2,440x3	sheet	0.5	0	10500	24500	0	5,250	12,250	21810kg x 180days
	M-D-2	Log Pile, Dia. 10cm	m	6	0	0	5000	0	0	30,000	
Others											
		Miscellaneous	L.S.					0	10,900	0	10%
Total for	1 unit							0	119,900	266,300	
Unit Cost for	1 unit							0	119,900	266,300	

ID No. CW-4-3 | Working Name: Install and Demolish Temporary Coffer for Rail Work | Calculation Quantity: 1 m3 | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	0.2	0	0	48800	0	0	9,760	
	L-2-23	Common Labour	day	1.2	0	0	35100	0	0	42,120	
Material											
	M-B-13	Solid Soil	m3	5	0	600	11400	0	3,000	57,000	
	M-M-15	Plastic Sack	nos.	15	0	750	1750	0	11,250	26,250	
	M-M-3	Prall Wire	kg	0.5	0	2250	5250	0	1,125	2,625	
	M-D-2	Log Pile, Dia. 10cm	m	32	0	0	5000	0	0	160,000	
Others											
		Demolition Work	%	10				0	1,538	29,776	
Total for	1 m3							0	16,913	327,531	
Unit Cost for	1 m3							0	16,913	327,531	

ID No. CW-4-4 | Working Name: Site Clearing for Railwork | Calculation Quantity: 1 m2 | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	0.01	0	0	48800	0	0	488	
	L-2-23	Common Labour	day	0.12	0	0	35100	0	0	4,212	
Others											
		Minor Tools	%	5				0	0	235	
Total for	1 m2							0	0	4,935	
Unit Cost for	1 m2							0	0	4,935	

* 1 : All labor rate are quated from Indonesian Standard.

Table 4.1.8 (3/9) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-1

ID No.	Working Name	Calculation Quantity	Remarks
CW-4-5	Removal/Demolish/Carriage of Tool	10 ton	10km Distance

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-1-48	Dumptruck; 10 ton	hourly	1	77269	3060	70744.12	77,269	3,060	70,744	
	A-2-1-71	Truck Crane; 11(10) ton, Oil Pressure	hourly	9	99321.89	1020	85928.77	893,897	9,180	773,359	
Labour											
	L-2-1	Foreman	day	5	0	0	48800	0	0	244,000	
	L-2-23	Common Labour	day	40	0	0	35100	0	0	1,404,000	
Material											
	M-M-3	Prall Wire	kg	1	0	2250	5250	0	2,250	5,250	
Total for	10 ton							971,166	14,490	2,497,353	
Unit Cost for	1 ton							97,117	1,449	249,735	

*1 : Disposal Volume : 10 ton

*2 : Dump Truck : 10 ton/dump / 1.2 time/ton = 8.33 ton/dump

10 km/rnd / 30 km/hr + 30 mnts(loss) = 0.83 hours

10 ton / 8.33 ton/dump = 1.2 dp/10ton

1.2 dp/10ton x 0.83 hours = 1 hours

* 3 : All labor rate are quated from Indonesian Standard.

ID No.	Working Name	Calculation Quantity	Remarks
CW-4-6	Replacing Ballast with Sleeper Mattress executed between Train Operation	10 m3	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	3	0	0	48800	0	0	146,400	
	L-2-23	Common Labour	day	25	0	0	35100	0	0	877,500	
Others											
		Minor Tools	%	5				0	0	51,195	
Total for	10 m3							0	0	1,075,095	
Unit Cost for	1 m3							0	0	107,510	

* 1 : All labor rate are quated from Indonesian Standard.

Table 4.1.8 (4/9) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-1

ID No.	Working Name	Calculation Quantity	Remarks
CW-4-7	Sand Bags	10 m	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	1.6	0	0	48800	0	0	78,080	
	L-2-23	Common Labour	day	8	0	0	35100	0	0	280,800	
Material											
	M-B-9	Soil for Backfilling	m3	3	0	400	7600	0	1,200	22,800	50% of Soil is purchased
	M-M-15	Plastic Sack	nos.	160	0	750	1750	0	120,000	280,000	
Working Base Cost											
	CW-1-46	Excavation A	m3	6	2361	39	1711	14,166	234	10,266	
Total for	10 m							14,166	121,434	671,946	
Unit Cost for	1 m							1,417	12,143	67,195	
Unit Cost for	1 nos							89	759	4,200	

* 1 : Labor Rate : Foreman : 1
Common Labor : 5
Daily Work Volume : 20 nos. / 1 common labor

ID No.	Working Name	Calculation Quantity	Remarks
CW-4-8	Temporary Steel Sheet Pile (Type-C)	4 m	L=9.0 long and 6.0m of Driving and Pulling Out (Type-II)

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Material											
	M-E-30	Steel Sheet Pile (Lease)	kg day	864000	16.30658	0	10.87105	14,088,884	0	9,392,589	
Working Base Cost											
	CW-3-9	Driving In of Steel Sheet Pile (Type-II)	m	6	9909.067	76.17755	8578.669	59,454	457	51,472	
	CW-3-10	Pulling Out of Steel Sheet Pile (Type-II)	m	6	9754	67	8548	58,524	402	51,288	
Total for	4 m							14,206,863	859	9,495,349	
Unit Cost for	1 m							3,551,716	215	2,373,837	
Unit Cost for	1 nos							1,420,686	86	949,535	

* 1 : Steel Sheet Pile : 48 kg/m x 9 m long x 4 m dstnc / 0.4 m wide
= 4320 kg
* 2 : Leasing Term : 200 days

ID No.	Working Name	Calculation Quantity	Remarks
CW-4-9	Installation of Tierod and Wale (Temporary)	10 ton	Excluding Material

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-2-58	Shotcrete Machine Wet Type : 0.8~1.2	hourly	5	68498.33	0	40476.29	342,492	0	202,381	
	A-2-1-72	Truck Crane; 16 ton, Oil Pressure	hourly	33	135641.1	1020	115858.5	4,476,156	33,660	3,823,330	
Labour											
	L-2-1	Foreman	day	5	0	0	48800	0	0	244,000	
	L-2-13	Rigger	day	10	0	0	39000	0	0	390,000	
	L-2-6	Welder	day	5	0	0	39000	0	0	195,000	
	L-2-23	Common Labour	day	5	0	0	35100	0	0	175,500	
Others											
		Miscellaneous	L.S.					385,552	2,740	402,489	8%
Total for	10 ton							5,204,200	36,400	5,432,700	
Unit Cost for	1 ton							520,420	3,640	543,270	

* 1 : All rates are quated from Japanese Manual (P294)

ID No.	Working Name	Calculation Quantity	Remarks
CW-4-10	Removal of Tierod and Wale (Temporary)	10 ton	Excluding Material

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-1-72	Truck Crane; 16 ton, Oil Pressure	hourly	20	135641.1	1020	115858.5	2,712,822	20,400	2,317,170	
Labour											
	L-2-1	Foreman	day	3	0	0	48800	0	0	146,400	
	L-2-13	Rigger	day	5	0	0	39000	0	0	195,000	
	L-2-23	Common Labour	day	3	0	0	35100	0	0	105,300	
Others											
		Miscellaneous	L.S.					244,178	1,900	248,830	9%
Total for	10 ton							2,957,000	22,300	3,012,700	
Unit Cost for	1 ton							295,700	2,230	301,270	

* 1 : All rates are quated from Japanese Manual (P294)

Table 4.1.8 (5/9) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-1

ID No.	Working Name	Calculation Quantity	Remarks
CW-4-11	Temporary Double Steel Sheet Pile	4 m	L=9.0 and 15.0m long and 4.7 and 10.7m of Driving and Pulling Out (Type-II)

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Material											
	M-B-9	Soil for Backfilling	m3	55.9	0	400	7600	0	22,360	424,840	50% of Total Volume
	M-E-4	Structural Steel(Purchasing), SS41	kg	114.9075	5225	0	275	600,392	0	31,600	
	M-E-12	Tierod (Lease)	kg day	56250	60	0	40	3,375,000	0	2,250,000	
	M-E-77	C-beam (Lease), SS41	kg day	96960	3.623684	0	2.415789	351,352	0	234,235	
	M-E-30	Steel Sheet Pile (Lease)	kg day	2304000	16.30658	0	10.87105	37,570,358	0	25,046,905	
Working Base Cost											
	CW-1-46	Excavation A	m3	111.8	2361	39	1711	263,960	4,360	191,290	
	CW-1-8	Tamper Loading	m3	111.8	1760	60	2600	196,768	6,708	290,680	
	CW-4-9	Installation of Tierod and Wale (Temporary)	ton	4.7	520420	3640	543270	2,445,974	17,108	2,553,369	
	CW-4-10	Removal of Tierod and Wale (Temporary)	ton	4.7	295700	2230	301270	1,389,790	10,481	1,415,969	
	CW-3-9	Driving In of Steel Sheet Pile (Type-II)	m	4.7	9909.067	76.17755	8578.669	46,573	358	40,320	River Side
	CW-3-10	Pulling Out of Steel Sheet Pile (Type-II)	m	4.7	9754	67	8548	45,844	315	40,176	River Side
	CW-3-9	Driving In of Steel Sheet Pile (Type-II)	m	10.7	9909.067	76.17755	8578.669	106,027	815	91,792	Field Side
	CW-3-10	Pulling Out of Steel Sheet Pile (Type-II)	m	10.7	9754	67	8548	104,368	717	91,464	Field Side
Total for	4 m							46,496,405	63,222	32,702,638	
Unit Cost for	1 m							11,624,101	15,806	8,175,660	
Unit Cost for	1 set							4,649,641	6,322	3,270,264	

* 1 : Steel Sheet Pile : 48 kg/m x 24 m long x 4 m dstnc / 0.4 m wide = 11520 kg

* 2 : Tie Rod Dia 42mm : 15 kg/m x 7.5 m long x 4 m dstnc / 1.6 m pitch = 281.25 kg

* 3 : Channel Beam 200x90 : 30.3 kg/m x 4 m dstnc x 4 pieces = 484.8 kg

* 4 : Structural Steel SS400 : 15 % of Total of Tierod and Beam = 114.9075 kg

* 5 : Soil Volume : 6.5 m wide x 4.3 m high x 4 m = 111.8 m3

* 6 : Leasing Term : 200 days

ID No.	Working Name	Calculation Quantity	Remarks
CW-4-12	Temporary Dewatering by D100mm	50 m	Width is 3m. Number of Working Day is 180 days including Installation and Removal

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-2-47	Submergible Pump; D100mm 5.5 kW	daily	60	26,903	0	13,589	1,614,187	0	815,329	for Driving
	A-2-2-15	Generator; 100 kVA	daily	60	215064	10800	160745.1	12,903,843	648,000	9,644,708	for Driving
	A-2-1-75	Truck Crane; 4.9 ton, Oil Pressure	hourly	1	55145.89	720	48324.47	55,146	720	48,324	for Installation and Removal
Labour											
	L-2-1	Foreman	day	0.2	0	0	48800	0	0	9,760	for Installation and Removal
	L-2-23	Common Labour	day	2.8	0	0	35100	0	0	98,280	for Installation and Removal
	L-2-4	Electrician	day	0.17	0	0	39000	0	0	6,630	for Driving
Total for	50 m							14,573,175	648,720	10,623,031	
Unit Cost for	1 m							291,464	12,974	212,461	
Unit Cost for	1 place							14,573,175	648,720	10,623,031	

Table 4.1.8 (6/9) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-1

ID No.	Working Name	Calculation Quantity	Remarks
CW-4-17	Temporary Double Steel Sheet Pile for Drainage Component	4 m	L=8m long and 3.3m of Driving and Pulling Out (Type-II)

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Working Base Cost											
	CW-1-1	Backfill (Soil) A	m3	165.12	6076	87	5043	1,003,269	14,365	832,700	
	CW-1-46	Excavation A	m3	220.16	2361	39	1711	519,798	8,586	376,694	
	CW-1-46	Excavation A	m3	55.04	2361	39	1711	129,949	2,147	94,173	for Replacement
	CW-1-8	Tamper Loading	m3	55.04	1760	60	2600	96,870	3,302	143,104	
	CW-4-9	Installation of Tierod and Wale (Temporary)	ton	0.66102	520420	3640	543270	344,008	2,406	359,112	
	CW-4-10	Removal of Tierod and Wale (Temporary)	ton	0.66102	295700	2230	301270	195,464	1,474	199,145	
	CW-3-9	Driving In of Steel Sheet Pile (Type-II)	m	37	9909.067	76.17755	8578.669	366,635	2,819	317,411	River Side
	CW-3-10	Pulling Out of Steel Sheet Pile (Type-II)	m	37	9754	67	8548	360,898	2,479	316,276	River Side
	CW-3-9	Driving In of Steel Sheet Pile (Type-II)	m	37	9909.067	76.17755	8578.669	366,635	2,819	317,411	Field Side
	CW-3-10	Pulling Out of Steel Sheet Pile (Type-II)	m	37	9754	67	8548	360,898	2,479	316,276	Field Side
Total for	4 m							3,744,425	42,876	3,272,303	
Unit Cost for	1 m							936,106	10,719	818,076	

* 1 :	Steel Sheet Pile :	48 kg/m x	16 m long x	4 m dstnc /	0.4 m wide
	=	7680 kg			
* 2 :	Tie Rod Dia 42mm :	9 kg/m x	4 m long x	4 m dstnc /	1.6 m pitch
	=	90 kg			
* 3 :	Channel Beam 200x90 :	30.3 kg/m x	4 m dstnc x	4 pieces =	484.8 kg
* 4 :	Structural Steel SS400 :	15 % of Total of Tierod and Beam		=	86.22 kg
* 5 :	Soil Volume :	3.2 m wide x	4.3 m high x	4 m =	55.04 m3

ID No.	Working Name	Calculation Quantity	Remarks
CW-4-18	Temporary Steel Sheet Pile with Support for Drainage	6 m	L=7.5m long and 7.5 and 3.0m of Driving and Pulling Out (Type-II)

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Working Base Cost											
	CW-2-7	Cutting Muddy Earth, 1m	m3	13.5	0	0	7400	0	0	99,900	
	CW-1-46	Excavation A	m3	40.5	2361	39	1711	95,621	1,580	69,296	
	CW-1-47	Excavation B	m3	40.5	2951	48	2138	119,516	1,944	86,589	
	CW-1-48	Excavation C	m3	40.5	3943	65	2857	159,692	2,633	115,709	for Replacement
	CW-3-17	Wale Work-B (Temporary)	ton	2.340365	558950	3200	581050	1,308,147	7,489	1,359,869	
	CW-4-10	Removal of Tierod and Wale (Temporary)	ton	2.340365	295700	2230	301270	692,046	5,219	705,082	
	CW-3-9	Driving In of Steel Sheet Pile (Type-II)	m	225	9909.067	76.17755	8578.669	2,229,540	17,140	1,930,201	River Side
	CW-3-10	Pulling Out of Steel Sheet Pile (Type-II)	m	90	9754	67	8548	877,860	6,030	769,320	River Side
Total for	6 m							5,482,420	42,034	5,135,964	
Unit Cost for	1 m							913,737	7,006	855,994	
Unit Cost for	1 set							365,495	2,802	342,398	

* 1 :	Steel Sheet Pile :	48 kg/m x	15 m long x	6 m dstnc /	0.4 m wide
	=	10800 kg			
* 3 :	H-beam for Waling 350-12x9 :	135 kg/m x	6 m dstnc x	2 pieces =	1620 kg
* 3 :	H-beam for Support 150-7x10 :	31.1 kg/m x	4.5 m long x	2 pieces =	279.9 kg
* 3 :	H-beam for Others 100-6x8 :	16.9 kg/m x	1 m long x	8 pieces =	135.2 kg
* 4 :	Structural Steel SS400 :	15 % of Total of Tierod and Beam		=	305.265 kg
* 5 :	Soil Volume :	5 m wide x	4.5 m high x	6 m =	135 m3

ID No.	Working Name	Calculation Quantity	Remarks
CW-4-21	Temporary Dewatering by D200mm	180 day	Assumption : Working Day is 180 days including Installation and Removal

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-2-49	Submergible Pump; D200mm 22kW	daily	180	81,666	0	41,250	14,699,859	0	7,424,929	for Driving
	A-2-2-16	Generator; 125 kVA	daily	180	271912.2	15120	209096	48,944,194	2,721,600	37,637,275	for Driving
	A-2-1-75	Truck Crane; 4.9 ton, Oil Pressure	hourly	1	55145.89	720	48324.47	55,146	720	48,324	for Installation and Removal
Labour											
	L-2-1	Foreman	day	0.2	0	0	48800	0	0	9,760	for Installation and Removal
	L-2-23	Common Labour	day	2.8	0	0	35100	0	0	98,280	for Installation and Removal
	L-2-4	Electrician	day	0.17	0	0	39000	0	0	6,630	for Driving
Total for	180 day							63,699,199	2,722,320	45,225,199	
Unit Cost for	1 day							353,884	15,124	251,251	

Table 4.1.8 (7/9) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-1

ID No.	Working Name	Calculation Quantity	Remarks
CW-4-22	Temporary Dewatering by D180mm	180 day	Assumption : Working Day is 180 days including Installation and Removal

Major Item	ID No.	Description	Unit	Quantity	Unit Cost			Cost			Remarks
					PF/C	IF/C	L/C	PF/C	IF/C	L/C	
Equipment											
		Submergible Pump; D200mm									
	A-2-2-49	22kW	daily	120	81,666	0	41,250	9,799,906	0	4,949,953	for Driving
	A-2-2-16	Generator; 125 kVA	daily	120	271912.2	15120	209096	32,629,463	1,814,400	25,091,517	for Driving
		Submergible Pump; D150mm									
	A-2-2-48	10.6 kW	daily	60	39,099	0	19,749	2,345,951	0	1,184,945	for Driving
	A-2-2-16	Generator; 125 kVA	daily	60	271912.2	15120	209096	16,314,731	907,200	12,545,758	for Driving
		Truck Crane; 4.9 ton, Oil									
	A-2-1-75	Pressure	hourly	1	55145.89	720	48324.47	55,146	720	48,324	for Installation and Removal
Labour											
	L-2-1	Foreman	day	0.2	0	0	48800	0	0	9,760	for Installation and Removal
	L-2-23	Common Labour	day	2.8	0	0	35100	0	0	98,280	for Installation and Removal
	L-2-4	Electrician	day	0.17	0	0	39000	0	0	6,630	for Driving
Total for	180 day							61,145,198	2,722,320	43,935,167	
Unit Cost for	1 day							339,696	15,124	244,084	

ID No.	Working Name	Calculation Quantity	Remarks
CW-4-23	Temporary Dewatering by D160mm	180 day	Assumption : Working Day is 180 days including Installation and Removal

Major Item	ID No.	Description	Unit	Quantity	Unit Cost			Cost			Remarks
					PF/C	IF/C	L/C	PF/C	IF/C	L/C	
Equipment											
		Submergible Pump; D200mm									
	A-2-2-49	22kW	daily	36	81,666	0	41,250	2,939,972	0	1,484,986	for Driving
	A-2-2-16	Generator; 125 kVA	daily	36	271912.2	15120	209096	9,788,839	544,320	7,527,455	for Driving
		Submergible Pump; D150mm									
	A-2-2-48	10.6 kW	daily	144	39,099	0	19,749	5,630,283	0	2,843,867	for Driving
	A-2-2-16	Generator; 125 kVA	daily	144	271912.2	15120	209096	39,155,355	2,177,280	30,109,820	for Driving
		Truck Crane; 4.9 ton, Oil									
	A-2-1-75	Pressure	hourly	1	55145.89	720	48324.47	55,146	720	48,324	for Installation and Removal
Labour											
	L-2-1	Foreman	day	0.2	0	0	48800	0	0	9,760	for Installation and Removal
	L-2-23	Common Labour	day	2.8	0	0	35100	0	0	98,280	for Installation and Removal
	L-2-4	Electrician	day	0.17	0	0	39000	0	0	6,630	for Driving
Total for	180 day							57,569,595	2,722,320	42,129,123	
Unit Cost for	1 day							319,831	15,124	234,051	

Table 4.1.8 (8/9) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-1

ID No. CW-4-13 | Working Name: Angsana Species | Calculation Quantity: 1 tree | Remarks: Total height from the root is 220cm

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	0.05	0	0	48800	0	0	2,440	
	L-2-23	Common Labour	day	0.2	0	0	35100	0	0	7,020	
Material											
	M-M-17	Manila Rope	kg	0.2	0	750	14250	0	150	2,850	
	M-D-3	Banboo Pile, Dia. 3cm)	m	5	0	0	650	0	0	3,250	
	M-I-1	Angsana	tree	1	0	0	15000	0	0	15,000	
Others											
	Ground Preparation including natural fertilizer, Red Soil and peat moss		L.S.	1			18000	0	0	18,000	
	Maintenance and Watering		L.S.	1			45000	0	0	45,000	
Total for	1 tree							0	150	93,560	
Unit Cost for	1 tree							0	150	93,560	

* 1 : All rates and Costs are based on quatation from Private firms.

ID No. CW-4-14 | Working Name: Glodogan Species | Calculation Quantity: 1 tree | Remarks: Total height from the root is 170cm

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	0.05	0	0	48800	0	0	2,440	
	L-2-23	Common Labour	day	0.2	0	0	35100	0	0	7,020	
Material											
	M-M-17	Manila Rope	kg	0.2	0	750	14250	0	150	2,850	
	M-D-3	Banboo Pile, Dia. 3cm)	m	5	0	0	650	0	0	3,250	
	M-I-2	Glodogan	tree	1	0	0	50000	0	0	50,000	
Others											
	Ground Preparation including natural fertilizer, Red Soil and peat moss		L.S.	1			18000	0	0	18,000	
	Maintenance and Watering		L.S.	1			45000	0	0	45,000	
Total for	1 tree							0	150	128,560	
Unit Cost for	1 tree							0	150	128,560	

* 1 : All rates and Costs are based on quatation from Private firms.

ID No. CW-4-15 | Working Name: Flamboyant Species | Calculation Quantity: 1 tree | Remarks: Total height from the root is 220cm

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	0.05	0	0	48800	0	0	2,440	
	L-2-23	Common Labour	day	0.2	0	0	35100	0	0	7,020	
Material											
	M-M-17	Manila Rope	kg	0.2	0	750	14250	0	150	2,850	
	M-D-3	Banboo Pile, Dia. 3cm)	m	5	0	0	650	0	0	3,250	
	M-I-3	Flamboyant	tree	1	0	0	150000	0	0	150,000	
Others											
	Ground Preparation including natural fertilizer, Red Soil and peat moss		L.S.	1			18000	0	0	18,000	
	Maintenance and Watering		L.S.	1			45000	0	0	45,000	
Total for	1 tree							0	150	228,560	
Unit Cost for	1 tree							0	150	228,560	

* 1 : All rates and Costs are based on quatation from Private firms.

Table 4.1.8 (9/9) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-1

ID No. CW-4-16 | Working Name: Relocating Trees | Calculation Quantity: 1 tree | Remarks: Total height from the root is 220cm

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	1	0	0	48800	0	0	48,800	
	L-2-23	Common Labour	day	2	0	0	35100	0	0	70,200	
Material											
	M-M-17	Manila Rope	kg	0.5	0	750	14250	0	375	7,125	
	M-D-3	Banboo Pile, Dia. 3cm)	m	12	0	0	650	0	0	7,800	
Others											
	Ground Preparation including natural fertilizer, Red Soil and peat moss		L.S.	1			36000	0	0	36,000	
	Trees Preparation and Equipment		L.S.	1			25000	0	0	25,000	
	Maintenance and Watering		L.S.	1			45000	0	0	45,000	
Total for	1 tree							0	375	239,925	
Unit Cost for	1 tree							0	375	239,925	

* 1 : All rates and Costs are based on quatation from Private firms.

ID No. CW-4-19 | Working Name: Palm Botol Planting | Calculation Quantity: 1 tree | Remarks: Total height from the root is minimum 200cm

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	0.05	0	0	48800	0	0	2,440	
	L-2-23	Common Labour	day	0.2	0	0	35100	0	0	7,020	
Material											
	M-M-17	Manila Rope	kg	0.2	0	750	14250	0	150	2,850	
	M-D-3	Banboo Pile, Dia. 3cm)	m	5	0	0	650	0	0	3,250	
		Palm Botol	tree	1	0	0	250000	0	0	250,000	
Others											
	Ground Preparation including natural fertilizer, Red Soil and peat moss		L.S.	1			18000	0	0	18,000	
	Maintenance and Watering		L.S.	1			45000	0	0	45,000	
Total for	1 tree							0	150	328,560	
Unit Cost for	1 tree							0	150	328,560	

* 1 : All rates and Costs are based on quatation from Private firms.

ID No. CW-4-20 | Working Name: Bougainvillea Planting | Calculation Quantity: 1 tree | Remarks: Total height from the root is minimum 100cm

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	0.05	0	0	48800	0	0	2,440	
	L-2-23	Common Labour	day	0.2	0	0	35100	0	0	7,020	
Material											
	M-M-17	Manila Rope	kg	0.2	0	750	14250	0	150	2,850	
	M-D-3	Banboo Pile, Dia. 3cm)	m	5	0	0	650	0	0	3,250	
		Bougainvillea	tree	1	0	0	25000	0	0	25,000	
Others											
	Ground Preparation including natural fertilizer, Red Soil and peat moss		L.S.	1			18000	0	0	18,000	
	Maintenance and Watering		L.S.	1			45000	0	0	45,000	
Total for	1 tree							0	150	103,560	
Unit Cost for	1 tree							0	150	103,560	

* 1 : All rates and Costs are based on quatation from Private firms.

Table 4.1.9 (1/18) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-2

ID No. CW-5-1 | Working Name: Loading/Unloading/Carriage of Equipment and Material | Calculation Quantity: 10 ton | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
		Transportation	ton	10			70,000			700,000	
Total for		10 ton						0	0	700,000	
Unit Cost for		1 ton						0	0	70,000	

ID No. CW-5-2 | Working Name: Replace Ballast with Sleeper Mattress (Ballast Excavation) | Calculation Quantity: 10 m3 | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	1	0	0	48800	0	0	48,800	
	L-2-11	Mason	day	5	0	0	39000	0	0	195000	
	L-2-23	Common Labour	day	6	0	0	35100	0	0	210600	
Others											
		Hand Tools	L.S.	1	25000		25000	25000	0	25000	
Total for		10 m3						25,000	0	479,500	
Unit Cost for		1 m3						2,500	0	47,940	

ID No. CW-5-3 | Working Name: Setting/Demolish Bulkhead Behind Temporary Bridge | Calculation Quantity: 0.216 m3 | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	3	0	0	48800	0	0	146,400	
	L-2-11	Mason	day	9	0	0	39000	0	0	351000	
	L-2-6	Welder	day	3	1	1	39000	3	3	117000	
	L-2-23	Common Labour	day	15	0	0	35100	0	0	526500	
Material											
	M-M-19	Rail R-33	ton	0.792	966315.8	0	0	765,322	0	0	
	M-M-7	Wooden Board Class II	m3	0.26	0	0	1250000	0	0	325000	
Others											
		Hand Tools	L.S.	1			30000			30,000	
Total for		0.216 m3						765,325	3	1,495,900	
Unit Cost for		1 m3						3,543,172	14	6,925,463	

ID No. CW-5-4 | Working Name: Setting/Demolish Temporary Abutment. Window Time Work | Calculation Quantity: 2 pieces | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	4	0	0	48800	0	0	195,200	
	L-2-11	Mason	day	16	0	0	39000	0	0	624000	
	L-2-23	Common Labour	day	22	0	0	35100	0	0	772200	
Others											
		Hand Tools	L.S.	1	50000		50000	50000	0	50000	
Total for		2 pieces						50,000	0	1,641,400	
Unit Cost for		1 pieces						25,000	0	820,700	

ID No. CW-5-5 | Working Name: Raising Track on The Bridge for 16 cm. Include 7.6 Setting Temporary Bridge | Calculation Quantity: 1 unit | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
		Raising Track on The Bridge for 16 cm. Include 7.6 Setting Temporary Bridge	L.S.	1	125000		125000	0	0	125,000	
Total for		1 unit						0	0	125,000	
Unit Cost for		1 unit						0	0	125,000	

Table 4.1.9 (2/18) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-2

ID No. CW-5-6 | Working Name: Setting/Demolish Temporary Bridge. Window Time Work. Lateral Transfer Erection | Calculation Quantity: 13.044 ton | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
		Roller 25 ton	No-day	24	27,178			652,272	0	0	
		Jack 15 ton	No-day	24	45296			1087104	0	0	
		Manual Wire Rope	No-day	12			63000	0	0	756000	
		Wire Rope etc.	L.S.	1			300000	0	0	300000	
Labour											
	L-2-1	Foreman	day	8	0	0	48800	0	0	390,400	
	L-2-33	Bridge Worker	day	26	0	0	58600	0	0	1523600	
	L-2-23	Common Labour	day	42	0	0	35100	0	0	1474200	
Material											
	M-M-20	Rail R-42	ton	0.672	966315.8	0	0	649,364	0	0	
	M-M-6	Wooden Sleeper for Bridge 18x22x200cm	nos.	30	0	0	187500	0	0	5625000	
Others											
		Miscellaneous	L.S.					60	0	0	
Total for	13.044 ton							2,388,800	0	10,069,200	
Unit Cost for	1 ton							183,134	0	771,941	

ID No. CW-5-7 | Working Name: Supplies and Setting Temporary Bridge | Calculation Quantity: 13.044 ton | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-1-74	Truck Crane; 35 ton, Oil Pressure	hourly	48	255716.8	1440	216489.77	12274406.7	69120	10391508.97	
		Hand Drill	No-day	7	16000		16000	112000	0	112000	
Labour											
		Labour Cost	ton	13.044			2000000	0	0	26,088,000	
	L-2-1	Foreman	day	10			48800	0	0	488000	
	L-2-16	Steel Worker	day	35			39000	0	0	1365000	
	L-2-23	Common Labour	day	55			35100	0	0	1930500	
Material											
		Material Cost	ton	14.653			4000000	0	0	58,612,000	
		HTB M22x85	pieces	152			30400	0	0	4620800	
		Base Plate	pieces	38			65000	0	0	2470000	
		Screw Spike	pieces	152			12500	0	0	1900000	
		Spring Washer	pieces	152			5000	0	0	760000	
		Bolt and Nut M16x350	pieces	57			4000	0	0	228000	
		Pandrol Clip	pieces	76			8000	0	0	608000	
Others											
		Transportation Cost	ton	13.044			70,000	0	0	913,080	
		Hand Tools	L.S.	1			250,000	0	0	250,000	
		Miscellaneous	L.S.					93	80	11	
Total for	13.044 ton							12,386,500	69,200	110,736,900	
Unit Cost for	1 ton							949,594	5,305	8,489,489	

ID No. CW-5-8 | Working Name: Supplies of Bridge Wooden Sleeper Size 13 x 22 x 200 cm | Calculation Quantity: 10 pieces | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Material											
	M-M-5	Wooden Sleeper 13x22x200cm	nos.	10	0	0	125000	0	0	1,250,000	
Others											
		Miscellaneous	L.S.					0	0	0	
Total for	10 pieces							0	0	1,250,000	
Unit Cost for	1 pieces							0	0	125,000	

ID No. CW-5-9 | Working Name: Setting and Demolish Sleeper Mattress as Temporary Abutment. Window Time Work | Calculation Quantity: 2 nos | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	5	0	0	48800	0	0	244,000	
	L-2-11	Mason	day	18	0	0	39000	0	0	702000	
	L-2-23	Common Labour	day	25	0	0	35100	0	0	877500	
Others											
		Hand Tools	L.S.	1			100,000	0	0	100,000	
Total for	2 nos							0	0	1,923,500	
Unit Cost for	1 nos							0	0	961,750	

Table 4.1.9 (3/18) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-2

ID No. CW-5-10 | Working Name: Setting and Demolish Ballast Wall | Calculation Quantity: 0.288 m3 | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
Labour											
	L-2-1	Foreman	day	3	0	0	48800	0	0	146,400	
	L-2-11	Mason	day	9	0	0	39000	0	0	351000	
	L-2-6	Welder	day	3	1	1	39000	3	3	117000	
	L-2-23	Common Labour	day	15	0	0	35100	0	0	526500	
Material											
	M-M-19	Rail R-33	ton	0.66	966315.8	0	0	637,768	0	0	
	M-M-7	Wooden Board Class II	m3		0	0	1250000	0	0	0	
Others											
		Hand Tools	L.S.	1			30000	0	0	30000	
		Miscellaneous	L.S.					29	97	0	
Total for	0.288 m3							637,800	100	1,170,900	
Unit Cost for	1 m3							2,214,583	347	4,065,625	

ID No. CW-5-11 | Working Name: Setting/Demolish Temporary Bridge. Window Time Work. Direct Crane Erection. Include Demolish | Calculation Quantity: 7.5 ton | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-1-41	Crawler Crane; 40 ton	hourly	32	279,714	1,080	251,509	8,950,834	34,560	8,048,285	
		Wire Rope etc.	L.S.	1			100000	0	0	100000	
Labour											
	L-2-1	Foreman	day	5	0	0	48800	0	0	244,000	
	L-2-11	Mason	day	17	0	0	39000	0	0	663000	
	L-2-23	Common Labour	day	30	0	0	35100	0	0	1053000	
Others											
		Hand Tools	L.S.	1			200000	0	0	200000	
		Miscellaneous	L.S.					66	40	15	
Total for	7.5 ton							8,950,900	34,600	10,308,300	
Unit Cost for	1 ton							1,193,453	4,613	1,374,440	

ID No. CW-5-12 | Working Name: Demolish/Carry out Existing Bridges (32+33). Include Demolish Temporary Bridge | Calculation Quantity: 2.1 ton | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
		Demolish/Carry out Existing Bridges (32+33). Include Demolish Temporary Bridge	L.S.	1				0	0	0	
Total for	2.1 ton							0	0	0	
Unit Cost for	1 ton							0	0	0	

ID No. CW-5-13 | Working Name: Remove The Bearing Steel. Window Time Work | Calculation Quantity: 4 Nos | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-2-1	Concrete Breaker; 600 kg	daily	12	232,611	0	93,259	2,791,335	0	1,119,107	
	A-2-2-7	Compressor; 3.5-3.7 m3/min	daily	6	120290.3	4032	92494.899	721742.0618	24192	554969.3919	
Labour											
	L-2-1	Foreman	day	4	0	0	48800	0	0	195,200	
	L-2-11	Mason	day	12	1	1	39000	12	12	468,000	
	L-2-23	Common Labour	day	20	0	0	35100	0	0	702000	
	L-2-6	Welder	day	4	0	0	39000	0	0	156000	
Others											
		Hand Tools	L.S.	1	75000		75000	75000	0	75000	
		Miscellaneous	L.S.					11	96	24	
Total for	4 Nos							3,588,100	24,300	3,270,300	
Unit Cost for	1 Nos							897,025	6,075	817,575	

ID No. CW-5-14 | Working Name: Construct/Demolish Receiver Staging. Include Bridge Raising | Calculation Quantity: 2 Nos | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
		Construct/Demolish Receiver Staging. Include Bridge Raising	Nos	2				0	0	0	
Total for	2 Nos							0	0	0	
Unit Cost for	1 Nos							0	0	0	

Table 4.1.9 (4/18) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-2

ID No.	Working Name	Calculation Quantity	Remarks
	Bridge Raising Implementation up to 44 cm Height.		
CW-5-15	Window Time Work	1 Step	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
		Jack 15 ton	Daily	20	45,296			905,920	0	0	
Labour											
	L-2-1	Foreman	day	3	0	0	48800	0	0	146,400	
	L-2-33	Bridge Worker	day	16	0	0	58600	0	0	937600	
	L-2-23	Common Labour	day	20	0	0	35100	0	0	702000	
Others											
		Hand Tools	L.S.	1	50000		50000	50000	0	50000	
		Miscellaneous	L.S.					80	0	0	
Total for		1 Step						956,000	0	1,836,000	
Unit Cost for		1 Step						956,000	0	1,836,000	

ID No.	Working Name	Calculation Quantity	Remarks
CW-5-16	HB-500x300x16x28, 4 bars, Include Erection	7.5 ton	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
		Hand Drill	No-day	7	16000		16000	112,000	0	112,000	
	A-2-1-74	Truck Crane; 35 ton, Oil Pressure	hourly	24	255,717	1,440	216,490	6,137,203	34,560	5,195,754	
Labour											
		Labour Cost	ton	7.5			500000	0	0	3,750,000	
	L-2-1	Foreman	day	8			48800	0	0	390400	
	L-2-16	Steel Worker	day	27			39000	0	0	1053000	
	L-2-23	Common Labour	day	43			35100	0	0	1509300	
	L-2-6	Welder	day	3			39000	0	0	117000	
Material											
		Material Cost	ton	9	2850000		150000	25,650,000	0	1,350,000	
		Angle L-100x100x10	ton	0.358	3040000		3040000	1,088,320	0	1,088,320	
		Bolt and Nut M16x800	pieces	24			8000	0	0	192,000	
		Bolt and Nut M16x550	pieces	20			5500	0	0	110,000	
		Bolt and Nut M16x400	pieces	24			4500	0	0	108,000	
	M-M-7	Wooden Board Class II	m3	0.21	0	0	1250000	0	0	262,500	
	M-M-5	Wooden Sleeper 13x22x200cm	nos.	22	0	0	125000	0	0	2750000	
		Base Plate	pieces	32			65000	0	0	2080000	
		Screw Spike	pieces	128			12500	0	0	1600000	
		Spring Washer	pieces	128			5000	0	0	640000	
		Pandrol Clip	pieces	64			8000	0	0	512000	
		Hook Bolt M16x200	pieces	20			4000	0	0	80000	
Others											
		Transportation Cost	ton	7.5			70,000	0	0	525,000	
		Miscellaneous	L.S.					77	40	26	
Total for		7.5 ton						32,987,600	34,600	23,425,300	
Unit Cost for		1 ton						4,398,347	4,613	3,123,373	

ID No.	Working Name	Calculation Quantity	Remarks
CW-5-17	Clearing	1 unit	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-23	Common Labour	day	40	0	0	35100	0	0	1,404,000	
Total for		1 unit						0	0	1,404,000	
Unit Cost for		1 unit						0	0	1,404,000	

ID No.	Working Name	Calculation Quantity	Remarks
CW-5-18	Demolish/The Wing of Bridge Abutment	2 m3	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-2-1	Concrete Breaker; 600 kg	daily	8	232,611	0	93,259	1,860,890	0	746,071	
	A-2-2-7	Compressor; 3.5-3.7 m3/min	daily	4	120290.3	4032	92494.899	481161.3745	16128	369979.5946	
Labour											
	L-2-1	Foreman	day	2	0	0	48800	0	0	97,600	
	L-2-11	Mason	day	6	0	0	39000	0	0	234000	
	L-2-23	Common Labour	day	10	0	0	35100	0	0	351000	
Others											
		Hand Tools	L.S.	1			50000	0	0	50000	
		Miscellaneous	L.S.					49	72	49	
Total for		2 m3						2,342,100	16,200	1,848,700	
Unit Cost for		1 m3						1,171,050	8,100	924,350	

ID No.	Working Name	Calculation Quantity	Remarks
CW-5-19	Supplies of Bridge Wooden Sleeper Size 18x22x200	10 pieces	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Material											
	M-M-6	Wooden Sleeper for Bridge 18x22x200cm	nos.	10	0	0	187500	0	0	1,875,000	
Total for		10 pieces						0	0	1,875,000	
Unit Cost for		1 pieces						0	0	187,500	

Table 4.1.9 (5/18) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-2

ID No. CW-5-20 | Working Name: Install/Removal of Cofferdam | Calculation Quantity: 108 m2 | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
		Equipment (Sheet Pile Driving L=10 m)	ton	103.2	227,000	45,400	181,600	23,426,400	4,685,280	18,741,120	
		Equipment (Sheet Pile Removal L =10 m)	ton	103.2	159000	31800	127200	16408800	3281760	13,127,040	
		Equipment (Sheet Pile Driving L=2mx5)	ton	21.6	680500	136100	544400	14698800	2939760	11,759,040	
		Equipment (Sheet Pile Removal L =2mx5)	ton	21.6	306500	61300	245200	6620400	1324080	5,296,320	
		Equipment (Joint Welding)	Nos	144	45000	9000	36000	6480000	1296000	5,184,000	
		Equipment (Joint Cutting)	Nos	144	450	90	360	64800	12960	51,840	
		Equipment (Wale and Strut Setting)	ton	35.32	315000	63000	252000	11125800	2225160	8,900,640	
		Equipment (Wale and Strut Removal)	ton	35.32	220500	44100	176400	7788060	1557612	6,230,448	
		Service Crane	month	2	10000000	2000000	8000000	20000000	4000000	16,000,000	
Labour											
		Labour (Sheet Pile Driving L=10 m)	ton	103.2			98,000	0	0	10,113,600	
		Labour (Sheet Pile Removal L =10 m)	ton	103.2			69,000	0	0	7,120,800	
		Labour (Sheet Pile Driving L=2mx3)	ton	21.6			292,000	0	0	6,307,200	
		Labour (Sheet Pile Removal L =2mx5)	ton	21.6			132,000	0	0	2,851,200	
		Labour (Joint Welding)	Nos	144			54,000	0	0	7,776,000	
		Labour (Joint Cutting)	Nos	144			2,100	0	0	302,400	
		Labour (Wale and Strut Setting)	ton	35.32	0	0	135,000	0	0	4,768,200	
		Labour (Wale and Strut Removal)	ton	35.32			94,500	0	0	3,337,740	
Material											
		H Beam 350x350x12x19	ton	21.192	1995000		105000	42278040	0	2,225,160	
		Sheet Pile FSP3	ton	74.88	2327500		122500	174283200	0	9,172,800	
		Temporary (Sheet Pile Driving L=10 m)	ton	103.2	49000		49000	5056800	0	5,056,800	
		Temporary (Sheet Pile Removal L =10 m)	ton	103.2	34500		34500	3560400	0	3,560,400	
		Temporary (Sheet Pile Driving L=2mx5)	ton	21.6	146000		146000	3153600	0	3,153,600	
		Temporary (Sheet Pile Removal L =2mx5)	ton	21.6	66000		66000	1425600	0	1,425,600	
		Temporary (Joint Welding)	Nos	144	18000		18000	2592000	0	2,592,000	
		Temporary (Wale and Strut Setting)	ton	35.32	67500		67500	2384100	0	2,384,100	
		Temporary (Wale and Strut Removal)	ton	35.32	47250		47250	1668870	0	1,668,870	
Others											
		Transportation	time	8	3000000	600000	2400000	24,000,000	4,800,000	19,200,000	
		Miscellaneous	L.S.					30	88	82	
Total for	108 m2							367,015,700	26,122,700	178,307,000	
Unit Cost for	1 m2							3,398,293	241,877	1,650,991	

ID No. CW-5-21 | Working Name: Pumping Work in The Stage for Structure Under Water Level, 220 days x 2 nos x 2 | Calculation Quantity: 1 L.S. | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
		Engine Pump 3"	No.	4	1,625,000		1,625,000			6,500,000	
		Sunny Hose 3"	m	80			7500	0	0	600000	
		Fuel etc.	day	880			10000	0	0	8800000	
Labour											
	L-2-23	Common Labour	day	440	0	0	35100	0	0	15,444,000	
Others											
		Miscellaneous	L.S.					0	0	0	
Total for	1 L.S.							0	0	31,344,000	
Unit Cost for	1 L.S.							0	0	31,344,000	

ID No. CW-5-22 | Working Name: Temporary Road for Pile Driving Equipment (for Pier Cirebon Side) H40mxW6mx2 | Calculation Quantity: 1 L.S. | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-2-35	Pick Hammer	daily	8	5,717	0	2,030	45,735	0	16,241	
		Plate Compactor	daily	8			15000	0	0	120000	
	A-2-1-9	Backhoe; 0.7 m3	hourly	104	153950.4	2160	110181.95	16010844.39	224640	11458922.89	
Labour											
	L-2-1	Foreman	day	11	0	0	48800	0	0	536,800	
	L-2-11	Mason	day	24	0	0	39000	0	0	936000	
	L-2-23	Common Labour	day	63	0	0	35100	0	0	2211300	
Material											
	M-B-6	River Gravel(Stone)	m3		0	2250	42750	0	0	0	
Others											
		Hand Tools	L.S.	1			50000	0	0	50000	
		Miscellaneous	L.S.					20	60	36	
Total for	1 L.S.							16,056,600	224,700	15,329,300	
Unit Cost for	1 L.S.							16,056,600	224,700	15,329,300	

ID No. CW-5-23 | Working Name: Load/Demolish/Carriage of Tool (L=256 km) | Calculation Quantity: 10 ton | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
		Transportation	ton	10	70000	14000	56000			560,000	
Total for	10 ton							0	0	560,000	
Unit Cost for	1 ton							0	0	56,000	

Table 4.1.9 (6/18) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-2

ID No. CW-5-24 | Working Name: Construct/Demolish Platform at Pier to Preparing Cross Supporter and Raising Work | Calculation Quantity: 6 Nos. | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
		Construct/Demolish Platform at Pier to Preparing Cross Supporter and Raising Work	L.S.	1				0	0	0	
Total for	6 Nos.							0	0	0	
Unit Cost for	1 Nos.							0	0	0	

ID No. CW-5-25 | Working Name: Remove The Bearing Steel and Change it with Stapling Window Time Work | Calculation Quantity: 1 Nos | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-2-1	Concrete Breaker; 600 kg	daily	1	232,611	0	93,259	232,611	0	93,259	
	A-2-2-7	Compressor; 3.5-3.7 m3/min	daily	2	120290.3	4032	92494.899	240580.6873	8064	184989.7973	
Labour											
	L-2-1	Foreman	day	1	0	0	48800	0	0	48,800	
	L-2-11	Mason	day	4	1	1	39000	4	4	156,000	
	L-2-23	Common Labour	day	6	0	0	35100	0	0	210600	
	L-2-6	Welder	day	2	0	0	39000	0	0	78000	
Others											
		Hand Tools	L.S.	1			100000	0	0	100000	
		Miscellaneous	L.S.					4	32	51	
Total for	1 Nos							473,200	8,100	871,700	
Unit Cost for	1 Nos							473,200	8,100	871,700	

ID No. CW-5-26 | Working Name: Construction/Demolish Sleeper Mattress Above Pier/Abutment of Base Cross-Support Include | Calculation Quantity: 41.76 m2 | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
		Construction/Demolish Sleeper Mattress Ab	m2	1				0	0	0	
Total for	41.76 m2							0	0	0	
Unit Cost for	1 m2							0	0	0	

ID No. CW-5-27 | Working Name: Construct and Setting Cross Girder. Window Time Work | Calculation Quantity: 20.476 ton | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-1-41	Crawler Crane; 40 ton	hourly	64	279,714	1,080	251,509	17,901,668	69,120	16,096,570	
		Equipment	day	20	10167			203340	0	0	
		Equipment	day	20			4244530	0	0	84890600	
Labour											
	L-2-1	Foreman	day	24	0	0	48800	0	0	1,171,200	
	L-2-24	Light Labour	day	144	0	0	29300	0	0	4,219,200	
	L-2-23	Common Labour	day	192	0	0	35100	0	0	6739200	
	L-2-6	Welder	day	48	0	0	39000	0	0	1872000	
Material											
		HTB M22x85	pieces	96	28880		1520	2,772,480	0	145,920	
Others											
		Miscellaneous	L.S.					12	80	10	
Total for	20.476 ton							20,877,500	69,200	115,134,700	
Unit Cost for	1 ton							1,019,608	3,380	5,622,910	

ID No. CW-5-28 | Working Name: Demolish Cross Girder | Calculation Quantity: 20.476 ton | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-1-41	Crawler Crane; 40 ton	hourly	40	279,714	1,080	251,509	11,188,543	43,200	10,060,356	
Labour											
	L-2-1	Foreman	day	8	0	0	48800	0	0	390,400	
	L-2-24	Light Labour	day	48	1	1	29300	48	48	1,406,400	
	L-2-23	Common Labour	day	64	0	0	35100	0	0	2246400	
	L-2-6	Welder	day	8	0	0	39000	0	0	312000	
Others											
		Hand Tools	L.S.	1			400000	0	0	400000	
		Miscellaneous	L.S.					9	52	44	
Total for	20.476 ton							11,188,600	43,300	14,815,600	
Unit Cost for	1 ton							546,425	2,115	723,559	

Table 4.1.9 (7/18) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-2

ID No. CW-5-29 | Working Name: Step by Step of Bridge Raising for 70 cm Height for 3 Span or Bridge, Window Time Work | Calculation Quantity: 15 cm | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
		Equipment	day	20	10167			203,340	0	0	
		Equipment	day	20	2122265	424453	1697812	42445300	8489060	33956240	
Labour											
	L-2-1	Foreman	day	3	0	0	48800	0	0	146,400	
	L-2-24	Light Labour	day	36	0	0	29300	0	0	1054800	
	L-2-23	Common Labour	day	52	1	1	35100	52	52	1825200	
	L-2-6	Welder	day	16	0	0	39000	0	0	624000	
Material											
		HTB M22x60	pieces	64	26030		1370	1,665,920	0	87,680	
		Saddle Material H-150 Incl. Rib	ton	8.712	1995000		105000	17380440	0	914760	
Others											
		Miscellaneous	L.S.					48	88	20	
Total for	15 cm							61,695,100	8,489,200	38,609,100	
Unit Cost for	1 cm							4,113,007	565,947	2,573,940	

ID No. CW-5-30 | Working Name: Removal of Pavement | Calculation Quantity: 1 m2 | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
		Removal of Pavement	m2	1				2,470	94	2,567	Assumption Thickness =5cm 1m2=0.05m3 Cost is same as CW-5-68
Total for	1 m2							2,470	94	2,567	
Unit Cost for	1 m2							2,470	94	2,567	

ID No. CW-5-31 | Working Name: Removal of Concrete Slab | Calculation Quantity: 1 m2 | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
		Removal of Concrete Slab	m2	1				14,817	562	15,405	Assumption Thickness =30cm 1m2=0.3m3 Cost is same as CW-5-68
Total for	1 m2							14,817	562	15,405	
Unit Cost for	1 m2							14,817	562	15,405	

ID No. CW-5-32 | Working Name: Piling/Demolish HB 400x300x12x15 | Calculation Quantity: 8 pieces | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
		Equipment Cost (H Beam Driving L=20)	ton	21.6	921,600	76,800	537,600	19,906,560	1,658,880	11,612,160	
		Equipment Cost (H Beam Removal L=20)	ton	21.6	507000	42250	295750	10951200	912600	6388200	
		Equipment Cost (Joint Welding)	Nos	8	75000	7500	52500	600000	60000	420000	
Labour											
		Labour Cost (H Beam Driving L=20)	ton	21.6	0	0	384000	0	0	8,294,400	
		Labour Cost (H Beam Removal L =20)	ton	21.6	0	0	212000	0	0	4579200	
		Labour Cost (Joint Welding)	Nos	8	0	0	90000	0	0	720000	
Material											
		Temporary Cost (Joint Welding)	Nos	8			60000	0	0	480,000	
Others											
		Transportation	time	2	3000000		3000000	6,000,000	0	6,000,000	
		Miscellaneous	L.S.					40	20	40	
Total for	8 pieces							37,457,800	2,631,500	38,494,000	
Unit Cost for	1 pieces							4,682,225	328,938	4,811,750	

ID No. CW-5-33 | Working Name: Setting/Demolish Steel Stiffening | Calculation Quantity: 0.242 ton | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	8	0	0	48800	0	0	390,400	
	L-2-23	Common Labour	day	16	1	1	35100	16	16	561,600	
	L-2-6	Welder	day	10	0	0	39000	0	0	390000	
	L-2-16	Steel Worker	day	12	0	0	39000	0	0	468000	
Material											
		HTB M22x75	pieces	64	27550		1450	1,763,200	0	92,800	
Others											
		Hand Tools	L.S.	1			200000	0	0	200000	
		Miscellaneous	L.S.					84	84	0	
Total for	0.242 ton							1,763,300	100	2,102,800	
Unit Cost for	1 ton							7,286,364	413	8,689,256	

Table 4.1.9 (8/18) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-2

ID No. CW-5-34 | Working Name: Setting/Demolish Cross Girder | Calculation Quantity: 4.756 ton | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-1-74	Truck Crane; 35 ton, Oil Pressure	hourly	56	255,717	1,440	216,490	14,320,141	80,640	12,123,427	
Labour											
	L-2-1	Foreman	day	8	0	0	48800	0	0	390,400	
	L-2-16	Steel Worker	day	15	1	1	39000	15	15	585,000	
	L-2-23	Common Labour	day	25	0	0	35100	0	0	877500	
	L-2-6	Welder	day	16	0	0	39000	0	0	624000	
Material											
		HTB M22x75	pieces	32	27550		1450	881,600	0	46,400	
		HTB M22x90	pieces	32	29735		1565	951520	0	50080	
Others											
		Hand Tools	L.S.	1			180000	0	0	180000	
		Miscellaneous	L.S.					24	45	93	
Total for	4.756 ton							16,153,300	80,700	14,876,900	
Unit Cost for	1 ton							3,396,405	16,968	3,128,028	

ID No. CW-5-35 | Working Name: Construct/Setting/Demolish Temporary Bridge. Window Time Work Direct Crane Erection | Calculation Quantity: 10.559 ton | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-1-74	Truck Crane; 35 ton, Oil Pressure	hourly	48	255,717	1,440	216,490	12,274,407	69,120	10,391,509	
	A-2-1-41	Crawler Crane; 40 ton	hourly	32	279713.6	1080	251508.91	8950834.2	34560	8048284.966	
		Wire Rope etc.	L.S.	1	50000	10000	40000	50000	10000	40000	
		Hand Drill	No-day	7	16000	3200	12800	112000	22400	89600	
Labour											
	L-2-1	Foreman	day	13	0	0	48800	0	0	634,400	
	L-2-23	Common Labour	day	85	0	0	35100	0	0	2983500	
	L-2-16	Steel Worker	day	52	0	0	39000	0	0	2028000	
Material											
		Base Plate	pieces	28			65000	0	0	1,820,000	
		Bolt and Nut M16x350	pieces	42			4000	0	0	168,000	
		HTB M22x85	pieces	112	28880		1520	3,234,560	0	170,240	
		Pandrol Clip	pieces	56			8000	0	0	448,000	
		Screw Spike	pieces	112			12500	0	0	1400000	
		Spring Washer	pieces	112			5000	0	0	560000	
Others											
		Hand Tools	L.S.	1			450000	0	0	450000	
		Miscellaneous	L.S.					99	20	66	
Total for	10.559 ton							24,621,900	136,100	29,231,600	
Unit Cost for	1 ton							2,331,840	12,889	2,768,406	

ID No. CW-5-36 | Working Name: Setting/Demolish Soldier Pile | Calculation Quantity: 11 pieces | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
		Equipment Cost (H Beam Driving L=20)	ton	21.6	768,000	153,600	614,400	16,588,800	3,317,760	13,271,040	
		Equipment Cost (H Beam Removal L=20)	ton	21.6	422500	84500	338000	9126000	1825200	7300800	
		Equipment Cost (Joint Welding)	Nos	8	75000	15000	60000	600000	120000	480000	
Labour											
		Labour Cost (H Beam Driving L=20)	ton	21.6	0	0	384000	0	0	8,294,400	
		Labour Cost (H Beam Removal L=20)	ton	21.6	0	0	212000	0	0	4579200	
		Labour Cost (Joint Welding)	Nos	8	0	0	90000	0	0	720000	
Material											
		Temporary Cost (Joint Welding)	Nos	8			60000	0	0	480,000	
		H Beam 300x300x10x15	ton	19.853	1995000		105000	39606735	0	2084565	
Others											
		Miscellaneous	L.S.					65	40	95	
Total for	11 pieces							65,921,600	5,263,000	37,210,100	
Unit Cost for	1 pieces							5,992,873	478,455	3,382,736	

ID No. CW-5-37 | Working Name: Setting Retaining Wall from Wooden Plate with Size of 8x12x300 cm, Incl. Material. | Calculation Quantity: 3 m3 | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	6	0	0	48800	0	0	292,800	
	L-2-13	Carpenter	day	12	0	0	39000	0	0	468000	
	L-2-23	Common Labour	day	24	0	0	35100	0	0	842400	
Material											
	M-M-7	Wooden Board Class II	m3	3.6	0	0	1250000	0	0	4,500,000	
Others											
		Hand Tools	L.S.	1			150000	0	0	150000	
		Miscellaneous	L.S.					0	0	0	
Total for	3 m3							0	0	6,253,200	
Unit Cost for	1 m3							0	0	2,084,400	

Table 4.1.9 (9/18) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-2

ID No. CW-5-38 | Working Name: Setting/Demolish Temporary Abutment | Calculation Quantity: 1 Nos | Remarks: Width is more than 4m

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	2	0	0	48800	0	0	97,600	
	L-2-11	Mason	day	5	0	0	39000	0	0	195000	
	L-2-23	Common Labour	day	8	0	0	35100	0	0	280800	
Others											
		Hand Tools	L.S.	1			20000	0	0	20000	
		Miscellaneous	L.S.					0	0	0	
Total for	1 Nos							0	0	593,400	
Unit Cost for	1 Nos							0	0	593,400	

ID No. CW-5-39 | Working Name: Fill with Gravel of Base Stapling Incl. Material | Calculation Quantity: 8.4 m3 | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
	A-2-2-35	Pick Hammer	daily	4	5,717	0	2,030	22,868	0	8,120	
		Plate Compactor	daily	4			15000	0	0	60000	
Labour											
	L-2-1	Foreman	day	2	0	0	48800	0	0	97,600	
	L-2-11	Mason	day	4	0	0	39000	0	0	156000	
	L-2-23	Common Labour	day	12	0	0	35100	0	0	421200	
Material											
	M-B-6	River Gravel(Stone)	m3	10.1	0	2250	42750	0	22,725	431,775	
Others											
		Hand Tools	L.S.	1			30000	0	0	30000	
		Miscellaneous	L.S.					32	75	5	
Total for	8.4 m3							22,900	22,800	1,204,700	
Unit Cost for	1 m3							2,726	2,714	143,417	

ID No. CW-5-40 | Working Name: Setting/Demolish Sleeper Mattress of Rail Bundles Supporter | Calculation Quantity: 2.25 m | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	6	0	0	48800	0	0	292,800	
	L-2-11	Mason	day	12	0	0	39000	0	0	468000	
	L-2-23	Common Labour	day	18	0	0	35100	0	0	631800	
Others											
		Hand Tools	L.S.	1			100000	0	0	100000	
		Miscellaneous	L.S.					0	0	0	
Total for	2.25 m							0	0	1,492,600	
Unit Cost for	1 m							0	0	663,378	

ID No. CW-5-41 | Working Name: Setting/Demolish Rail Bundles | Calculation Quantity: 4 Line | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	6	0	0	48800	0	0	292,800	
	L-2-16	Steel Worker	day	24	0	0	39000	0	0	936000	
	L-2-6	Welder	day	4	1	1	39000	4	4	156000	
	L-2-23	Common Labour	day	32	0	0	35100	0	0	1123200	
Material											
		Angle L-100x100x10	ton	0.465	3040000		160000	1,413,600	0	74,400	
		U Bolt	pieces	80	38000		38000	3040000	0	3040000	
Others											
		Hand Tools	L.S.	1			20000	0	0	20000	
		Miscellaneous	L.S.					96	96	0	
Total for	4 Line							4,453,700	100	5,642,400	
Unit Cost for	1 Line							1,113,425	25	1,410,600	

ID No. CW-5-42 | Working Name: Install Sleeper Saddle Rail Bundles for False Work Base | Calculation Quantity: 6 m2 | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	3	0	0	48800	0	0	146,400	
	L-2-16	Steel Worker	day	8	0	0	39000	0	0	312000	
	L-2-23	Common Labour	day	13	0	0	35100	0	0	456300	
Others											
		Hand Tools	L.S.	1			40000	0	0	40000	
		Miscellaneous	L.S.					0	0	0	
Total for	6 m2							0	0	954,700	
Unit Cost for	1 m2							0	0	159,117	

Table 4.1.9 (10/18) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-2

ID No. CW-5-43 — Working Name: Setting/Demolish Construction with Roller. Window Time Work — Calculation Quantity: 8 unit — Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment	A-2-1-41	Crawler Crane, 40 ton	hourly		279,714	1,080	251,509	0	0	0	
		Equipment	day	16	10167			162672	0	0	
		Equipment	day	16			4244530	0	0	67912480	
Labour	L-2-1	Foreman	day	14	0	0	48800	0	0	683,200	
	L-2-24	Light Labour	day	84	1	1	29300	84	84	2,461,200	
	L-2-6	Welder	day	28	0	0	39000	0	0	1092000	
	L-2-23	Common Labour	day	112	0	0	35100	0	0	3931200	
Others		Miscellaneous	L.S.					44	16	20	
Total for	8 unit							162,800	100	76,080,100	
Unit Cost for	1 unit							20,350	13	9,510,013	

ID No. CW-5-44 — Working Name: Setting Horizontal of Bridge. Window Time Work — Calculation Quantity: 3 times — Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment		Equipment	day	9	10167			91503	0	0	
		Equipment	day	9			4244530	0	0	38200770	
Labour	L-2-1	Foreman	day	10	0	0	48800	0	0	488,000	
	L-2-24	Light Labour	day	66	1	1	29300	66	66	1,933,800	
	L-2-6	Welder	day	26	0	0	39000	0	0	1014000	
	L-2-23	Common Labour	day	104	0	0	35100	0	0	3650400	
Others		Miscellaneous	L.S.					31	34	30	
Total for	3 times							91,600	100	45,287,000	
Unit Cost for	1 times							30,533	33	15,095,667	

ID No. CW-5-45 — Working Name: HB. In Various Size — Calculation Quantity: 63.258 ton — Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour		Labour Cost	ton	63.258			500000	0	0	31,629,000	
Material		Material Cost	ton	75.91	2850000		150000	216,343,500	0	11,386,500	
Others		Transportation Cost	ton	63.258	35000	7000	28000	2,214,030	442,806	1,771,224	
		Miscellaneous	L.S.					70	94	76	
Total for	63.258 ton							218,557,600	442,900	44,786,800	
Unit Cost for	1 ton							3,455,019	7,001	708,002	

ID No. CW-5-46 — Working Name: Bridge Wooden Sleeper with Size of 18x22x200 cm for Temporary Bridge — Calculation Quantity: 10 pieces — Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Material	M-M-6	Wooden Sleeper 18x22x180cm	pieces	10	0	0	90000	0	0	900,000	
Total for	10 pieces							0	0	900,000	
Unit Cost for	1 pieces							0	0	90,000	

ID No. CW-5-47 — Working Name: Rail Rental — Calculation Quantity: 10 ton — Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Material	M-M-20	Rail R-42	ton	10	966315.8	0	0	9,663,158	0	0	
Others		Miscellaneous	L.S.					42	0	0	
Total for	10 ton							9,663,200	0	0	
Unit Cost for	1 ton							966,320	0	0	

Table 4.1.9 (11/18) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-2

ID No. CW-5-48 | Working Name: Raising the Bridge for 83 cm Height and Distapling | Calculation Quantity: 1 Step | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment		Jack 15 ton	Daily	24	45,296			1,087,104	0	0	
Labour	L-2-1	Foreman	day	4	0	0	48800	0	0	195,200	
	L-2-33	Bridge Worker	day	20	0	0	58600	0	0	1172000	
	L-2-23	Common Labour	day	28	0	0	35100	0	0	982800	
Others		Hand Tools	L.S.	1			100000	0	0	100000	
		Miscellaneous	L.S.					96	0	0	
Total for	1 Step							1,087,200	0	2,450,000	
Unit Cost for	1 Step							1,087,200	0	2,450,000	

ID No. CW-5-49 | Working Name: Construct/Setting/Demolish Temporary Bridge. Window Time Work. Direct Crane Erection | Calculation Quantity: 10.559 ton | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment	A-2-1-74	Truck Crane; 35 ton, Oil Pressure	hourly	56	255,717	1,440	216,490	14,320,141	80,640	12,123,427	
	A-2-1-41	Crawler Crane; 40 ton	hourly	40	279713.6	1080	251508.91	11188542.75	43200	10060356.21	
		Wire Rope etc.	L.S.	1			100000	0	0	100000	
		Hand Drill	No-day	8			32000	0	0	256000	
Labour	L-2-1	Foreman	day	17	0	0	48800	0	0	829,600	
	L-2-23	Common Labour	day	96	0	0	35100	0	0	3369600	
	L-2-16	Steel Worker	day	59	0	0	39000	0	0	2301000	
Material		Base Plate	pieces	40			65000	0	0	2,600,000	
		Bolt and Nut M16x350	pieces	80			4000	0	0	320,000	
		HTB M22x85	pieces	160	28880		1520	4,620,800	0	243,200	
		Pandrol Clip	pieces	80			8000	0	0	640,000	
		Screw Spike	pieces	160			12500	0	0	2000000	
		Spring Washer	pieces	160			5000	0	0	800000	
Others		Hand Tools	L.S.	1			450000	0	0	450000	
		Miscellaneous	L.S.					16	60	17	
Total for	10.559 ton							30,129,500	123,900	36,093,200	
Unit Cost for	1 ton							2,853,443	11,734	3,418,240	

ID No. CW-5-50 | Working Name: Setting/Demolish Temporary Cross Girder. Man Power | Calculation Quantity: 7.298 ton | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment		Lever Block etc.	L.S.	1			120,000	0	0	120,000	
Labour	L-2-1	Foreman	day	8	0	0	48800	0	0	390,400	
	L-2-16	Steel Worker	day	20	0	0	39000	0	0	780000	
	L-2-23	Common Labour	day	46	0	0	35100	0	0	1614600	
Material											
Others		Hand Tools	L.S.	1			50000	0	0	50000	
		Miscellaneous	L.S.					0	0	0	
Total for	7.298 ton							0	0	2,955,000	
Unit Cost for	1 ton							0	0	404,905	

ID No. CW-5-51 | Working Name: Sening/Demolish Rail Bundles Include Material | Calculation Quantity: 4 Line | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour	L-2-1	Foreman	day	4	0	0	48800	0	0	195,200	
	L-2-16	Steel Worker	day	18	0	0	39000	0	0	702000	
	L-2-6	Welder	day	2	1	1	39000	2	2	78000	
	L-2-23	Common Labour	day	22	0	0	35100	0	0	772200	
Material		Angle L-100x100x10	ton	0.139	3040000		160000	422,560	0	22,240	
		U Bolt	pieces	24	38000		2000	912000	0	48000	
Others		Hand Tools	L.S.	1			20000	0	0	20000	
		Miscellaneous	L.S.					38	98	60	
Total for	4 Line							1,334,600	100	1,837,700	
Unit Cost for	1 Line							333,650	25	459,425	

Table 4.1.9 (12/18) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-2

ID No. CW-5-52 | Working Name: Setting/Demolish Bulkhead Behind The Temporary Abutment | Calculation Quantity: 0.288 m3 | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-1	Foreman	day	3	0	0	48800	0	0	146,400	
	L-2-11	Mason	day	9	1	1	39000	9	9	351,000	
	L-2-23	Common Labour	day	15	0	0	35100	0	0	526500	
	L-2-6	Welder	day	3	0	0	39000	0	0	117000	
Material											
	M-M-7	Wooden Board Class II	m3	0.35	0	0	1250000	0	0	437,500	
Others											
		Hand Tools	L.S.	1			30000	0	0	30000	
		Miscellaneous	L.S.					91	91	0	
Total for	0.288 m3							100	100	1,608,400	
Unit Cost for	1 m3							347	347	5,584,722	

ID No. CW-5-53 | Working Name: Setting/Demolish Receiver Staging of Existing Bridge. | Include Demolish the Existing Bridge | Calculation Quantity: 2 Nos | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
								0	0	0	
		Setting/Demolish Receiver Staging of Existing Bridge. Include Demolish the Existing Bridge						0	0	0	
								0	0	0	
Total for	2 Nos							0	0	0	
Unit Cost for	1 Nos							0	0	0	

ID No. CW-5-54 | Working Name: Demolish of Existing Bridge. Include Demolish Temporary Bridge | Calculation Quantity: 2 Nos | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
								0	0	0	
		Demolish of Existing Bridge. Include Demolish Temporary Bridge						0	0	0	
								0	0	0	
Total for	2 Nos							0	0	0	
Unit Cost for	1 Nos							0	0	0	

ID No. CW-5-55 | Working Name | Calculation Quantity: 2 Nos | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
								0	0	0	
								0	0	0	
								0	0	0	
Total for	2 Nos							0	0	0	
Unit Cost for	1 Nos							0	0	0	

ID No. CW-5-56 | Working Name: Material Supplies for Temporary Bridge | Calculation Quantity: 63.258 ton | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
		Labour Cost	ton	14.907			2000000	0	0	29,814,000	
Material											
		Material Cost	ton	17.888	3800000		200000	67,974,400	0	3,577,600	
Others											
		Transportation Cost	ton	14.907			70000	0	0	1,043,490	
		Miscellaneous	L.S.					0	0	10	
Total for	63.258 ton							67,974,400	0	34,435,100	
Unit Cost for	1 ton							1,074,558	0	544,360	

ID No. CW-5-57 | Working Name: Clearing of Site | Calculation Quantity: 1 unit | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
	L-2-23	Common Labour	day	60	0	0	35100	0	0	2,106,000	
Others											
		Miscellaneous	L.S.					0	0	0	
Total for	1 unit							0	0	2,106,000	
Unit Cost for	1 unit							0	0	2,106,000	

ID No. CW-5-58 | Working Name: Coarse Sand | Calculation Quantity: 100 m3 | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Material											
	M-B-4	Sand for Filling and Base Course	m3	120	0	1350	25650	0	162,000	3,078,000	
Others											
		Miscellaneous	L.S.					0	0	0	
Total for	100 m3							0	162,000	3,078,000	
Unit Cost for	1 m3							0	1,620	30,780	

Table 4.1.9 (13/18) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-2

ID No. CW-5-59 | Working Name: Ballast | Calculation Quantity: 100 m3 | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Material											
	M-M-4	Ballast 2-6 cm	m3	120	0	3250	61750	0	390,000	7,410,000	
Others											
		Miscellaneous	L.S.					0	0	0	
Total for	100 m3							0	390,000	7,410,000	
Unit Cost for	1 m3							0	3,900	74,100	

ID No. CW-5-60 | Working Name: Track Raising Every 5 cm until 70-100 cm for 5 km/h Speed | Calculation Quantity: 100 m | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
		Track Jack	hour	3	1,500	300	1,200	4,500	900	3,600	
		Hand Tie Tamper	hour	3	10000	2000	8000	30000	6000	24000	
		Manual Track Equipment	L.S	1	5500	1100	4400	5500	1100	4400	
Labour											
		Track Raising	m	100			15500	0	0	1,550,000	
		Track Compaction	m	100			12000	0	0	1200000	
Others											
		Miscellaneous	L.S.					0	0	0	
Total for	100 m							40,000	8,000	2,782,000	
Unit Cost for	1 m							400	80	27,820	

ID No. CW-5-61 | Working Name: Track Tamping for 20 km/h | Calculation Quantity: 100 m | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Equipment											
		Track Jack	hour	5	1,500	300	1,200	7,500	1,500	6,000	
		Hand Tie Tamper	hour	5	10000	2000	8000	50000	10000	40000	
		Manual Track Equipment	L.S	1	5500	1100	4400	5500	1100	4400	
Labour											
		Track Compaction	m	100			12000	0	0	1200000	
Others											
		Miscellaneous	L.S.					0	0	0	
Total for	100 m							63,000	12,600	1,250,400	
Unit Cost for	1 m							630	126	12,504	

ID No. CW-5-62 | Working Name: Track Tamping for > 60 km/h (By Tamping Machine). Use MTT | Calculation Quantity: 100 m | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
		MTT	m	100			15,750	0	0	1,575,000	
Others											
		Miscellaneous	L.S.					0	0	0	
Total for	100 m							0	0	1,575,000	
Unit Cost for	1 m							0	0	15,750	

ID No. CW-5-63 | Working Name: Guard of Restriction Speed (2x2x90) | Calculation Quantity: 360 MD | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Labour											
		Train Watcher	Person-mo	12			700,000	0	0	8,400,000	
Others											
		Miscellaneous	L.S.					0	0	0	
Total for	360 MD							0	0	8,400,000	
Unit Cost for	1 MD							0	0	23,333	

Table 4.1.9 (14/18) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-2

ID No.	Working Name	Calculation Quantity	Remarks
CW-5-64	Demolition and Removal of Exisiting Substructure (Stone/Brick Masonry)	100 m3	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost			Cost			Remarks
					FF/C	IF/C	L/C	FF/C	IF/C	L/C	
Direct Cost											
Equipment											
	A-2-1-7	Backhoe; 0.6 m3	hourly	8.33	125,543	2,040	90,965	1,045,772	16,993	757,739	
	A-2-2-35	Pick Hammer	daily	14.49	5716.911	0	2030.087	82,854	0	29,422	
	A-2-1-48	Dumptruck; 10 ton	hourly	17.13	77269	3060	70744.12	1,323,618	52,418	1,211,847	
	A-2-2-17	Generator; 15 kVA	daily	3.62	82875	1800	52496.05	300,008	6,516	190,036	
Labour											
	L-2-1	Foreman	day	3.62	0	0	48800	0	0	176,812	
	L-2-10	Drill Worker	day	14.49	0	0	39000	0	0	565,247	
	L-2-23	Common Labour	day	14.49	0	0	35100	0	0	508,696	
Working Base Cost											
	CW-1-54	Excavation I	m3	100	5072	83	3675	507,200	8,300	367,500	
Total for	100 m3							3,259,452	84,227	3,807,268	
Unit Cost for	1 m3							32,595	842	38,073	

Manpower Composition; Foreman : 1 man/day
Common Labor : 4 man/day
Drill Worker : 4 man/day

*1 50m3 x Ta / (T x 60) x Composition of Manpower = Foreman 3.62, Drill Worker 14.49, Common 14.49

*2 100m3 x Tb / 60 = Dump Truck 17.13 hour

*3 50m3 x Ta / (T x 60) = Generator 3.62 days

*4 50m3 x Tc / 60 = Backfoe 8.33 hour

*5 Average Daily Working Time of Generator, Labor, Breaker: T = 690 / 100 = 6.9 (hour/day)

Working Time by Hand Breaker / 1m3 (Ta): Ta = 30 minutes/m3

Working Time by Dump Truck / 1m3 (Tb): Tb= (5 km(one way) x 2 / 40 km/hour + 20 minutes)/ 10 ton truck = 10.28 minutes/m3

Working Time by Backfoe and Pick Hammer / 1m3 (Tc): Tc = 10 minutes/m3

Table 4.1.9 (15/18) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-2

ID No. CW-5-65 | Working Name: Demolition and Removal of Exisiting Substructure (Stone Masonry) | Calculation Quantity: 100 m3 | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Equipment											
	A-2-1-7	Backhoe; 0.6 m3	hourly	8.33	125,543	2,040	90,965	1,045,772	16,993	757,739	
	A-2-2-35	Pick Hammer	daily	14.49	5716.911	0	2030.087	82,854	0	29,422	
	A-2-1-48	Dumptruck; 10 ton	hourly	17.13	77269	3060	70744.12	1,323,618	52,418	1,211,847	
	A-2-2-17	Generator; 15 kVA	daily	3.62	82875	1800	52496.05	300,008	6,516	190,036	
Labour											
	L-2-1	Foreman	day	3.62	0	0	48800	0	0	176,812	
	L-2-10	Drill Worker	day	14.49	0	0	39000	0	0	565,217	
	L-2-23	Common Labour	day	14.49	0	0	35100	0	0	508,696	
Working Base Cost											
	CW-1-54	Excavation 1	m3	100	5072	83	3675	507,200	8,300	367,500	
Total for	100 m3							3,259,452	84,227	3,807,268	
Unit Cost for	1 m3							32,595	842	38,073	
Unit Cost for	15 m3							488,918	12,634	571,090	
Unit Cost for	1 L.S.							488,918	12,634	571,090	

Manpower Composition; Foreman : 1 man/day
Common Labor : 4 man/day
Drill Worker : 4 man/day

*1 50m3 x Ta / (T x 60) x Composition of Manpower = Foreman 3.62, Drill Worker 14.49, Common 14.49

*2 100m3 x Tb / 60 = Dump Truck 17.13 hour

*3 50m3 x Ta / (T x 60) = Generator 3.62 days

*4 50m3 x Tc / 60 = Backfoe 8.33 hour

*5 Average Daily Working Time of Generator, Labor, Breaker: T = 690 / 100 = 6.9 (hour/day)

Working Time by Hand Breaker / 1m3 (Ta): Ta = 30 minutes/m3

Working Time by Dump Truck / 1m3 (Tb): Tb = (5 km(one way) x 2 / 40 km/hour + 20 minutes) / 10 ton truck = 10.28 minutes/m3

Working Time by Backfoe and Pick Hammer / 1m3 (Tc): Tc = 10 minutes/m3

ID No. CW-5-66 | Working Name: Removal ballast | Calculation Quantity: 10 m3 | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Equipment											
	0	0			0	0	0	0	0	0	
Labour											
	L-2-1	Foreman	day	0.0125	0	0	48800	0	0	610	
	L-2-23	Common Labour	day	0.25	0	0	35100	0	0	8,775	
Material											
	M-M-4	Ballast 2-6 cm	m3	1	0	3250	61750	0	3,250	61,750	
Working Base Cost											
	0	0			0	0	0	0	0	0	
Others											
Total for	10 m3							0	3,250	71,135	
Unit Cost for	1 m3							0	325	7,114	

Table 4.1.9 (16/18) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-2

ID No. CW-5-67 | Working Name: Dewatering for BH5 | Calculation Quantity: 1 L.S. | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Equipment											
	A-2-2-14	Generator; 10 kVA	daily	75	65,615	1,440	41,622	4,921,131	108,000	3,121,687	
	A-2-1-71	Truck Crane; 11(10) ton, Oil Pressure	hourly	4.571429	99,322	1,020	85,929	454,043	4,663	392,817	
	A-2-2-50	Submergible Pump; D50mm 1.5 kW	daily	150	11837.37	0	5979.079	1,775,605	0	896,862	
Labour											
	L-2-1	Foreman	day	0.2	0	0	48800	0	0	9,760	
	L-2-4	Electrician	day	25.5	0	0	39000	0	0	994,500	
	L-2-23	Common Labour	day	2.8	0	0	35100	0	0	98,280	
Working Base Cost											
		Install and Demolish									
	CW-4-3	Temporary Coffer for Rail	m3	5	0	16912.5	327530.5	0	84,563	1,637,653	
	CW-1-47	Excavation B	m3	2	2951	48	2138	5,902	96	4,276	for Ditch
	CW-1-2	Backfill (Soil) B	m3	2	7022	103	6326	14,044	206	12,652	for Ditch
Total for	1 L.S.							7,170,725	197,527	7,168,487	
Unit Cost for	1 L.S.							7,170,725	197,527	7,168,487	

*1 : Labor for Pumping — Electrician : 0.17 person x 150 days = 26
*2 : Labor for Installation and Removal — Foreman : 0.2 psn/time x 1 places = 0.2
Common Labor : 2.8 psn/time x 1 places = 3
*3 : Equipment — Pump : 150 days
Truck Crane : 0.8 dy/plcs x 5.714286 hr/dy x 1 places = 5 hours
*4 : Generator : 150 days x 3 hr/dy / 6 hours/day = 75 days
*5 : Coefficient above are quated from Japanese Standard and Equipment Data

ID No. CW-5-68 | Working Name: Demolition & Removal of Concrete Structure | Calculation Quantity: 100 m3 | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Equipment											
	A-2-1-7	Backhoe; 0.6 m3	hourly	8.33	125,543	2,040	90,965	1,045,772	16,993	757,739	
	A-2-2-10	Concrete Breaker; 20 kg	daily	1.21	9136.077	0	3181.312	11,055	0	3,849	
	A-2-1-48	Dumptruck; 10 ton	hourly	17.13	77269	3060	70744.12	1,323,618	52,418	1,211,847	
	A-2-2-16	Generator; 125 kVA	daily	7.24	271912.2	15120	209096	1,968,644	109,469	1,513,855	
	A-2-2-35	Pick Hammer	daily	14.49	5716.911	0	2030.087	82,854	0	29,422	
Labour											
	L-2-1	Foreman	day	3.62	0	0	48800	0	0	176,812	
	L-2-10	Drill Worker	day	14.49	0	0	39000	0	0	565,217	
	L-2-23	Common Labour	day	14.49	0	0	35100	0	0	508,696	
Working Base Cost											
	CW-1-54	Excavation I	m3	100	5072	83	3675	507,200	8,300	367,500	
Total for	100 m3							4,939,143	187,180	5,134,936	
Unit Cost for	1 m3							49,391	1,872	51,349	

Manpower Composition; Foreman : 1 man/day
Common Labor : 4 man/day
Drill Worker : 4 man/day

*1 50m3 x Ta / T x 60 x Composition of Manpower = Foreman 3.62, Drill Worker 14.49, Common 14.49
*2 100m3 x Tb / 60 = Duump Truck 17.13 hour
*3 50m3 x Ta / T x 60 = Generator 3.62 days
*4 50m3 x Te / 60 = Backfoe and Breaker 8.33 hour = 1.21 day

*5 Truck Crane Working Time / Piling Working Time = 60 %

*6 Average Daily Working Time of Generator, Labor, Breaker: T = 690 / 100 = 6.9 (hour/day)

Working Time by Hand Breaker / 1m3 (Ta): Ta = 30 minutes/m3

Working Time by Dump Truck / 1m3 (Tb): Tb = (5 km(one way) x 2 / 40 km/hour + 20 minutes) / 10 ton truck = 10.28 minutes/m3

Working Time by Backfoe and Breaker / 1m3 (Te): Te = 10 minutes/m3

Table 4.1.9 (17/18) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-2

ID No. CW-5-69 | Working Name: Dewatering for BH 6 | Calculation Quantity: 1 L.S. | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Equipment											
	A-2-2-14	Generator; 10 kVA	daily	75	65,615	1,440	41,622	4,921,131	108,000	3,121,687	
	A-2-1-71	Truck Crane; 11(10) ton, Oil Pressure	hourly	4.571429	99,322	1,020	85,929	454,043	4,663	392,817	
	A-2-2-50	Submergible Pump; D50mm 1.5 kW	daily	150	11837.37	0	5979.079	1,775,605	0	896,862	
Labour											
	L-2-1	Foreman	day	0.2	0	0	48800	0	0	9,760	
	L-2-4	Electrician	day	25.5	0	0	39000	0	0	994,500	
	L-2-23	Common Labour	day	2.8	0	0	35100	0	0	98,280	
Working Base Cost											
	CW-4-3	Install and Demolish Temporary Coffer for Rail	m3	8	0	16912.5	327530.5	0	135,309	2,620,244	
	CW-1-47	Excavation B	m3	3	2951	48	2138	8,853	144	6,414	for Ditch
	CW-1-2	Backfill (Soil) B	m3	3	7022	103	6326	21,066	309	18,978	for Ditch
Total for		1 L.S.						7,180,698	248,416	8,159,542	
Unit Cost for		1 L.S.						7,180,698	248,416	8,159,542	

*1 : Labor for Pumping — Electrician : 0.17 person x 150 days = 26
*2 : Labor for Installation and Removal — Foreman : 0.2 psn/time x 1 places = 0.2
Common Labor : 2.8 psn/time x 1 places = 3
*3 : Equipment — Pump : 150 days
Truck Crane : 0.8 dy/plcs x 5.714286 hr/dy x 1 places = 5 hours
*4 : Generator : 150 days x 3 hr/dy / 6 hours/day = 75 days
*5 : Coefficient above are quated from Japanese Standard and Equipment Data

ID No. CW-5-70 | Working Name: Removal of steel bearing | Calculation Quantity: 10 piece | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Labour											
	L-2-16	Steel Worker	day	20	0	0	39000	0	0	780,000	
Others											
		Small Tools	%	5				0	0	39,000	
Total for		10 piece						0	0	819,000	
Unit Cost for		1 piece						0	0	81,900	

* 1 : Labor Rate is quated from Indonesian Standard.

ID No. CW-5-71 | Working Name: Dewatering for BH.10 | Calculation Quantity: 1 L.S. | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Equipment											
	A-2-2-14	Generator; 10 kVA	daily	270	65,615	1,440	41,622	17,716,072	388,800	11,238,074	
	A-2-1-71	Truck Crane; 11(10) ton, Oil Pressure	hourly	4.571429	99,322	1,020	85,929	454,043	4,663	392,817	
	A-2-2-50	Submergible Pump; D50mm 1.5 kW	daily	540	11837.37	0	5979.079	6,392,179	0	3,228,703	
Labour											
	L-2-1	Foreman	day	0.2	0	0	48800	0	0	9,760	
	L-2-4	Electrician	day	91.8	0	0	39000	0	0	3,580,200	
	L-2-23	Common Labour	day	2.8	0	0	35100	0	0	98,280	
Working Base Cost											
	CW-4-3	Temporary Coffer for Rail Work	m3	108	0	16912.5	327530.5	0	1,826,550	35,373,294	for Ditch
Total for		1 L.S.						24,562,294	2,220,013	53,921,127	
Unit Cost for		1 L.S.						24,562,294	2,220,013	53,921,127	

*1 : Labor for Pumping — Electrician : 0.17 person x 540 days = 92
*2 : Labor for Installation and Removal — Foreman : 0.2 psn/time x 1 places = 0.2
Common Labor : 2.8 psn/time x 1 places = 3
*3 : Equipment — Pump : 540 days
Truck Crane : 0.8 dy/plcs x 5.714286 hr/dy x 1 places = 5 hours
*4 : Generator : 540 days x 3 hr/dy / 6 hours/day = 270 days
*5 : Coefficient above are quated from Japanese Standard and Equipment Data

Table 4.1.9 (18/18) CALCULATION SHEET FOR TEMPORARY WORK AND RAIL WORK-2

ID No.	Working Name	Calculation Quantity	Remarks
CW-5-72	Temporary Construction Road for BH10	1 L.S.	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Material											
	M-B-12	Crushed Stone for Pavement and Concrete	m3	33.33	0	3250	61750	0	108,323	2,058,128	
	M-B-9	Soil for Backfilling	m3	222.22	0	400	7600	0	88,888	1,688,872	
	M-B-2	Coarse Aggregate	m3	55.56	0	2600	49400	0	144,456	2,744,664	
Working Base Cost											
	CW-1-56	Spreading and Compaction for Gravel Pavement	m3	30	5117.168	43.2	16431.17	153,515	1,296	492,935	
	CW-1-59	Spreading and Compaction-D	m3	250	1509	19	1473	377,250	4,750	368,250	
Indirect Cost											
Site Expense			%	15	0.5		0.5	617,349	0	617,349	
Profit and Overhead Cost			%	10	0.8		0.2	757,282	0	189,320	
		Miscellaneous	L.S.					4	88	82	Round Up
Total for	1 L.S.							1,905,400	347,800	8,159,600	
Unit Cost for	1 L.S.							1,905,400	347,800	8,159,600	

*1 :	Gravel :	30	m3 /	0.9	=	33.33	m3
*2 :	Aggregate :	50	m3 /	0.9	=	55.56	m3
*3 :	Soil in General :	200	m3 /	0.9	=	222.22	m3

ID No.	Working Name	Calculation Quantity	Remarks
CW-5-73	Dewatering for BH.13	1 L.S.	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Equipment											
	A-2-2-14	Generator; 10 kVA	daily	105	65,615	1,440	41,622	6,889,584	151,200	4,370,362	
	A-2-1-71	Truck Crane; 11(10) ton, Oil Pressure	hourly	4.571429	99,322	1,020	85,929	454,043	4,663	392,817	
	A-2-2-50	Submergible Pump; D50mm 1.5 kW	daily	210	11837.37	0	5979.079	2,485,847	0	1,255,607	
Labour											
	L-2-1	Foreman	day	0.2	0	0	48800	0	0	9,760	
	L-2-4	Electrician	day	35.7	0	0	39000	0	0	1,392,300	
	L-2-23	Common Labour	day	2.8	0	0	35100	0	0	98,280	
Working Base Cost											
	CW-4-3	Install and Demolish Temporary Coffer for Rail	m3	20	0	16912.5	327530.5	0	338,250	6,550,610	
	CW-1-47	Excavation B	m3	5	2951	48	2138	14,755	240	10,690	for Ditch
	CW-1-2	Backfill (Soil) B	m3	5	7022	103	6326	35,110	515	31,630	for Ditch
Install and removal temporary structure for telephone cable, signal cable, etc.											
		Install and Removal Temporary Structures	L.S.	1			5000000	0	0	5,000,000	
Total for	1 L.S.							9,879,339	494,868	19,112,056	
Unit Cost for	1 L.S.							9,879,339	494,868	19,112,056	

*1 :	Labor for Pumping	Electrician :	0.17 person x	210 days =	36	
*2 :	Labor for Installation and Removal	Foreman :	0.2 psn/time x	1 places =	0.2	
		Common Labor :	2.8 psn/time x	1 places =	3	
*3 :	Equipment	Pump :	210 days			
		Truck Crane :	0.8 dy/plcs x	5.714286 hr/dy x	1 places =	5 hours
*4 :		Generator :	210 days x	3 hr/dy /	6 hours/day=	105 days
*5 :	Coefficient above are quated from Japanese Standard and Equipment Data					

Table 4.2.1 SCHEDULE OF TRUCK IN GENERAL NEEDED FOR MOBILIZATION AND DEMOBILIZATION

MOBILIZATION AND DEMOBILIZATION OF SIMONGAN WEIR

Construction Equipment	Capacity/ Specification	Number of Equipment																																	
		2001												2002												2003											
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Dump Truck	10 ton		2			15	9	8	3			2	4		2				9	4	5			2	4			2						1		2	
Ordinary Truck	10 ton				3		3																														
Truck with Crane A	4 ton			1			1	1	1	1	1	1	1	1		1	1		1	1	1	1	1		2					1				1		2	
Truck with Crane B	6 ton				2		2	1						1																							

Mobilization
Demobilization

MOBILIZATION AND DEMOBILIZATION OF FLOODWAY / GARANG RIVER

Construction Equipment	Capacity/ Specification	Number of Equipment																																	
		2001												2002												2003											
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Barge A	200 ton				2									1									1														
Barge B	100 m3				4	2								1									1														
Tug Boat	15 ton				2									1									1														
Dump Truck	10 ton				29	2	6				11		9				56	4	8	21	2	10	6	2	100	1	2		67	3	18	9	4	3	13		38
Truck with Crane A	4 ton				2		3										7		2	2	1			2	6	3		2	1			1			1		7

Table 4.2.2 SCHEDULE OF TRAILER NEEDED FOR MOBILIZATION AND DEMOBILIZATION

MOBILIZATION AND DEMOBILIZATION OF SIMONGAN WEIR

Construction Equipment	Capacity/ Specification	Number of Trailer																																	
		2001												2002												2003										
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Buldozer A	15 ton		1										1		1										1			1							1	
Backhoe/Excavator A	0.20 m3								1																									1			
Backhoe/Excavator B	0.35 m3		1		1	1	1	1				1	1			1			1	1				1	1			1							1		
Backhoe/Excavator C	0.60 m3					1	1												1	1																	
Giant Breaker	600/800 kg					1	1												1	1																	
Clamshell Bucket with Crane	40 ton				1	1						1	1				1	1																	1	1	
Truck Crane A	20 ton									1	1	1	1																			1		1			
Truck Crane B	25 ton							1		1		1		1									1		1					1			1		1	1	
Crawler Crane A	40 ton			1			1	1	1			1	1			1									1								1		1		
Crawler Crane B	50 ton										1	1																					1		1		
Vibratory Pile Driver	30 kw			1			1		1			1	1			1									1									1		1		
Portable Concrete Mixer A	0.5 m3								1																									1			
Tamper	60/100 kg				1				1				1								1				1				1						1		
Wire Sawing Machine					1		1																														
Wall Sawing Machine					1		1																														
Welding Machine	250 AMP							1			1		1										1		1				1			1		1			
Engine Welder	250 AMP									1			1																		1					1	
Diesel Engine Generator A	125 KVA									1			1																		1					1	
Air Compresor								1				1											1		1				1					1		
Number of Trailer for Moblization			1	1	2	2	2	1	1	2	1	2			1	2	1		2		1		1	1				1		2		1	2	1	1		
Number of Trailer for Demoblization						1	2	1	1			2	4	1				1		2					3									2	2	4	

Mobilization
Demobilization

MOBILIZATION AND DEMOBILIZATION OF FLOODWAY/GARANG RIVER

Construction Equipment	Capacity/ Specification	Number of Trailer																																	
		2001												2002												2003										
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Buldozer A	15 ton				2		1				1		1				1					1	1		3		1		2		1		1				1
Buldozer B	21 ton						1		1																												
Backhoe/Excavator A	0.20 m3				2													3						1	3				3								3
Backhoe/Excavator B	0.35 m3				2		2		1				1				3	2			1				5				1			1	1		1		3
Backhoe/Excavator C	0.60 m3				2		1				1						2			1	1			1	4				3	1			1				2
Giant Breaker	600/800 kg																												1	1			1				1
Clamshell Grabbing	1.0 m3				1									1									1														
Crawler Crane A	40 ton																2	2			2	2			2	2											
Vibro Hammer	23/24 ton																1	1			1	1			1	1			1								
Portable Concrete Mixer A	0.5 m3						1										1		1		1				1				1			1			1		1
Tamper	60/100 kg				1		1					1						1	1					1	1				1								1
Vibrating Roller B	10 ton																				1				1								1				
Tire Roller	8/12 ton																				1				1				1								1
Motor Grader	2.8 m																				1				1								1				
Welding Machine	250 AMP						1											1							1												1
Number of Trailer for Moblization					5		3				1		1				5	4	1		2	1			2		1		5			1	1				
Number of Trailer for Demoblization							1		1			1	1	1				2		1	2	2	1	2	9	2			2	1	1		2	1	1	1	6

Table 4.2.3 NUMBER OF TRUCK IN GENERAL TRANSPORTATION FOR MOBILIZATION AND DEMOBILIZATION

MOBILIZATION AND DEMOBILIZATION OF SIMONGAN WEIR

Construction Equipment	Capacity/ Specification	Number of Equipment						Total	
		2001		2002		2003			
		M	D	M	D	M	D	M	D
Dump Truck	10 ton	22	21	13	13		5	35	39
Ordinary Truck	10 ton	3	3					3	3
Truck with Crane A	4 ton	5	3	4	6	2	2	11	11
Truck with Crane B	6 ton	3	2		1			3	3

MOBILIZATION AND DEMOBILIZATION OF FLOODWAY/GARANG RIVER

Construction Equipment	Capacity/ Specification	Number of Equipment						Total	
		2001		2002		2003			
		M	D	M	D	M	D	M	D
Barge A	200 ton	2			2			2	2
Barge B	100 m3	4	2		2			4	4
Tug Boat	15 ton	2			2			2	2
Dump Truck	10 ton	48	9	86	123	78	80	212	212
Truck with Crane A	4 ton	5		11	9	4	11	20	20

Table 4.2.4 NUMBER OF TRAILER TRANSPORTATION FOR MOBILIZATION AND DEMOBILIZATION

MOBILIZATION AND DEMOBILIZATION OF SIMONGAN WEIR

Construction Equipment	Capacity/ Specification	Number of Transportation			Total
		2001	2002	2003	
Buldozer A	15 ton	2	2	2	6
Backhoe/Excavator A	0.20 m3	1	0	1	2
Backhoe/Excavator B	0.35 m3	7	5	2	14
Backhoe/Excavator C	0.60 m3	2	2	0	4
Giant Breaker	600/800 kg	2	2	0	4
Clamshell Bucket with Crane	40 ton	4	2	2	8
Truck Crane A	20 ton	1	0	1	2
Truck Crane B	25 ton	1	1	1	3
Crawler Crane A	40 ton	6	2	2	10
Crawler Crane B	50 ton	2	0	2	4
Vibratory Pile Driver	30 kw	5	2	2	9
Portable Concrete Mixer A	0.5 m3	1	0	1	2
Tamper	60/100 kg	3	2	2	7
Wire Sawing Machine		2	0	0	2
Wall Sawing Machine		2	0	0	2
Welding Machine	250 AMP	3	2	3	8
Engine Welder	250 AMP	2	0	2	4
Diesel Engine Generator A	125 KVA	2	0	2	4
Air Compresor		2	2	2	6
Total Number of Trailer for Mobilization		15	9	8	32
Total Number of Trailer for Demobilization		11	7	8	26

Construction Equipment	Capacity/ Specification	Number of Transportation			Total
		2001	2002	2003	
Buldozer A	15 ton	5	6	6	17
Buldozer B	21 ton	2	0	0	2
Backhoe/Excavator A	0.20 m3	2	7	6	15
Backhoe/Excavator B	0.35 m3	6	11	7	24
Backhoe/Excavator C	0.60 m3	4	9	7	20
Giant Breaker	600/800 kg	0	0	4	4
Clamshell Grabbing	1.0 m3	1	2	0	3
Crawler Crane A	40 ton	0	10	2	12
Vibro Hammer	23/24 ton	0	5	2	7
Portable Concrete Mixer A	0.5 m3	1	4	4	9
Tamper	60/100 kg	3	4	2	9
Vibrating Roller B	10 ton	0	2	2	4
Tire Roller	8/12 ton	0	2	2	4
Motor Grader	2.8 m	0	2	2	4
Welding Machine	250 AMP	1	2	1	4
Total Number of Trailer for Mobilization		10	15	8	33
Total Number of Trailer for Demobilization		4	20	17	41

Table 4.2.5 (1/119) CALCULATION SHEET FOR UNIT COST OF EACH PAYMENT ITEM OF THREE PACKAGES

ID No.	Working Name	Calculation Quantity	Remarks
R-P1-Bq-2	Mobilization and Demobilization	1 L.S.	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Equipment											
	A-3-1-69	Trailer; 20 ton	hourly	296	119,879	2,160	102,572	35,484,307	639,360	30,361,214	
	A-2-1-48	Dumptruck; 10 ton	hourly	1,696	77269	3060	70744.12	131,048,217	5,189,760	119,982,029	
	A-2-1-80	Truck; 11 ton	hourly	0	96,932	1,560	95,161	0	0	0	
	A-2-1-31	Truck with crane; 4 ton, Crane	hourly	160	48669.75	780	47767.65	7,787,160	124,800	7,642,824	
	A-2-1-32	Truck with crane; 6 ton	hourly	0	62783.98	912	61243.41	0	0	0	
	A-2-2-37	Pontoon Barge; 100 ton	daily	14	314821.3	0	237790.6	4,407,498	0	3,329,068	
	A-2-2-41	Drifter Air Type : 150kg class	daily	27	257007.1	0	88827.32	6,939,191	0	2,398,338	
	A-2-1-84	Tugboat; 15 ton	hourly	96	129433.1	4410	140042.2	12,425,574	426,240	13,444,052	
Indirect Cost											
Site Expense			%	15	0.8		0.2	45,795,556	0	11,448,889	
Profit and Overhead Cost			%	10	0.8		0.2	35,109,926	0	8,777,482	
		Miscellaneous	L.S.					71	40	6	Round Up
Total for		1 L.S.						278,997,500	6,380,200	197,383,900	
Unit Cost for		1 L.S.						278,997,500	6,380,200	197,383,900	

* 1 : All Equipment : Land Transportation : 4 hours land trasnportation. 24 hours ship transportation
All Equipment : Ship Transportation : Though it takes longer time than land transportation, it asumes that the cost is same.

* 2 : Number of Mobilized and Demobilized Equipment

	Mobilization	Demobilization
Trailer	33	41
Dump Truck 10t	212	212
Ordinary Truck 10t		
Truck with Crane 4 t	20	20
Truck with Crane 6 t		
Pontoon Berge 100 t	2	2
Soil Carriage 100m3	4	4
Tag Boat 15 ton	2	2

ID No.	Working Name	Calculation Quantity	Remarks
R-P1-Bq-4	Temporary Construction Road and Bridge	1 L.S.	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Material											
	M-B-12	Crushed Stone for Pavement and Concrete	m3	1660	0	3250	61750	0	5,395,000	102,505,000	for Excavation
	M-B-13	Solid Soil	m3	15830	0	600	11400	0	9,498,000	180,462,000	for Embankment
	M-B-12	Crushed Stone for Pavement and Concrete	m3	830	0	3250	61750	0	2,697,500	51,252,500	for Embankment
Working Base Cost											
	CW-1-46	Excavation A	m3	2880	2361	39	1711	6,799,680	112,320	4,927,680	for Excavation
	CW-1-12	Slope Clearing of Excavation by Machine	m2	7000	4018	66	3760	28,126,000	462,000	26,320,000	for Excavation
	CW-4-1	Temporary Bridge	m2	0	917231.6	19318.14	861665.6	0	0	0	for Embankment
	CW-1-56	Spreading and Compaction for Gravel Pavement	m3	750	5117.168	43.2	16431.17	3,837,876	32,400	12,323,375	for Embankment
	CW-1-59	Spreading and Compaction-D	m3	28500	1509	19	1473	43,006,500	541,500	41,980,500	for Embankment
Indirect Cost											
Site Expense			%	15	0.8		0.2	62,433,580	0	15,608,395	
Profit and Overhead Cost			%	10	0.8		0.2	47,865,744	0	11,966,436	
		Miscellaneous	L.S.					20	80	14	Round Up
Total for		1 L.S.						192,069,400	18,738,800	447,345,900	
Unit Cost for		1 L.S.						192,069,400	18,738,800	447,345,900	

for Embankment

* 1 : Temporary Road Body Volume (V1) : 0.5 x (5.0 m wide + 14.00 m wide) x 3.0 m high
= 28.5 m3/m (Purchased Soil Volume = 50 % of Total Volume)
Purchased Soil for Road : 14.25 m3/m / 0.9 loss = 15.83 m3/m

* 2 : Gravel Pavement Volume (V2) : 0.15 m thick x 5.0 m wide = 0.75 m3/m
Purchased Crushed Stone : 0.75 m3/m / 0.9 loss = 0.83 m3/m

* 3 : Temporary Road Length (tl1) : 700 m from Construction Planning roundup 1000 m

* 4 : Temporary Bridge Length (tl2) : m from Construction Planning roundup 0 m

for Excavated Road

* 5 : Excavation Volume (V3) : 1.44 m3/1m from Construction Planning

* 6 : Gravel Pavement Volume(V4) : 0.83 m3/1m

* 7 : Slope Clearing : 3.5 m/1m

* 8 : Temporary Road Length (tl3) : 1360 m from Construction Planning roundup 2000 m

Table 4.2.5 (2/119) CALCULATION SHEET FOR UNIT COST OF EACH PAYMENT ITEM OF THREE PACKAGES

ID No. R-P1-Bq-5 | Working Name: Contractor's Site Office and Facilities | Calculation Quantity: 1 L.S. | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
		Install of Office and Others	m2	1148	80000	80000	915000	91,840,000	91,840,000	1,050,420,000	including all facilities
		Removal of Office	%	30				27,552,000	27,552,000	315,126,000	
		Rental of Land	%	10				11,939,200	11,939,200	136,554,600	
Indirect Cost											
Site Expense			%	15	0.8		0.2	211,771,560	0	52,942,890	
Profit and Overhead Cost			%	10	0.8		0.2	162,358,196	0	40,589,549	
		Miscellaneous	L.S.					44	0	61	
Total for		1 L.S.						505,461,000	131,331,200	1,595,633,100	
Unit Cost for		1 L.S.						505,461,000	131,331,200	1,595,633,100	

ID No. R-P1-Bq-6 | Working Name: Engineer's Site Office and Facilities | Calculation Quantity: 1 L.S. | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
		Install of Office	m2	88	80000	80000	915000	7,040,000	7,040,000	80,520,000	including all facilities
		Removal of Office	%	30				2,112,000	2,112,000	24,156,000	
		Rental of Land	%	10				915,200	915,200	10,467,600	
Indirect Cost											
Site Expense			%	15	0.8		0.2	16,233,360	0	4,058,340	
Profit and Overhead Cost			%	10	0.8		0.2	12,445,576	0	3,111,394	
		Miscellaneous	L.S.					64	0	66	
Total for		1 L.S.						38,746,200	10,067,200	122,313,400	
Unit Cost for		1 L.S.						38,746,200	10,067,200	122,313,400	

ID No. R-P1-Bq-7 | Working Name: Drawings | Calculation Quantity: 1 L.S. | Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Labour											
	L-2-34	Cad Operator	day	400	0	0	54700	0	0	21,880,000	
	L-2-35	Draft Man	day	400	0	0	39000	0	0	15,600,000	
Material											
	M-L-15	Drawing Paper (A1)	sheet	200	8000	0	2000	1,600,000	0	400,000	
	M-L-16	Blue Copy (A1)	sheet	200	0	2500	2500	0	500,000	500,000	
Others											
		Tools	%	20				320,000	100,000	7,676,000	Computer, Plotter, Drafer and etc.
Indirect Cost											
Site Expense			%	15	0.8		0.2	5,829,120	0	1,457,280	
Profit and Overhead Cost			%	10	0.8		0.2	4,468,992	0	1,117,248	
		Miscellaneous	L.S.					88	0	72	Round Up
Total for		1 L.S.						12,218,200	600,000	48,630,600	
Unit Cost for		1 L.S.						12,218,200	600,000	48,630,600	

Table 4.2.5 (3/119) CALCULATION SHEET FOR UNIT COST OF EACH PAYMENT ITEM OF THREE PACKAGES

ID No.	Working Name	Calculation Quantity	Remarks
R-P1-Bq-8	Surveying	1 L.S.	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
		Drawing Plan of River Scale 1:500	ha	10			112,000	0	0	1,120,000	
		River Cross Section Survey Scale 1:100									
		a. Surveying	section	20			232000	0	0	4,640,000	
		b. Drawing & Processing	section	20			62000	0	0	1,240,000	
Indirect Cost											
Site Expense			%	15	0.8		0.2	840,000	0	210,000	
Profit and Overhead Cost			%	10	0.8		0.2	644,000	0	161,000	
		Miscellaneous	L.S.					0	0	0	Round Up
Total for	1 L.S.							1,484,000	0	7,371,000	
Unit Cost for	1 L.S.							1,484,000	0	7,371,000	

ID No.	Working Name			Calculation Quantity	Remarks
R-P1-Bq-10	Auger Boring	R-P2-Bq-10	Auger Boring	2 m	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Working Base Cost											
		Hand Auger with Laboratory Test	m	2	0	0	150000	0	0	300,000	Inclusive of Laboratory Test : 1
Others											
Indirect Cost											
Site Expense			%	15	0.8		0.2	36,000	0	9,000	
Profit and Overhead Cost			%	10	0.8		0.2	27,600	0	6,900	
		Miscellaneous	L.S.					0	0	0	
Total for	2 m							63,600	0	315,900	
Unit Cost for	1 m							31,800	0	157,950	

ID No.	Working Name			Calculation Quantity	Remarks
R-P1-Bq-11	Rotary Boring	R-P2-Bq-11	Rotary Boring	20 m	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Working Base Cost											
		Rotary Boring with Laboratory Test	m	20	0	0	300000	0	0	6,000,000	Inclusive of Labpratory Test : 1m each
Indirect Cost											
Site Expense			%	15	0.8		0.2	720,000	0	180,000	
Profit and Overhead Cost			%	10	0.8		0.2	552,000	0	138,000	
		Miscellaneous	L.S.					0	0	0	
Total for	20 m							1,272,000	0	6,318,000	
Unit Cost for	1 m							63,600	0	315,900	

Table 4.2.5 (4/119) CALCULATION SHEET FOR UNIT COST OF EACH PAYMENT ITEM OF THREE PACKAGES

ID No.	Working Name	Calculation Quantity	Remarks
R-P1-Bq-12	Exploratory Excavation	3 m3	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost			Cost			Remarks
					PF/C	IF/C	L/C	PF/C	IF/C	L/C	
Direct Cost											
Working Base Cost											
	CW-1-46	Excavation A	m3	1	2361	39	1711	2,361	39	1,711	
	CW-1-47	Excavation B	m3	1	2951	48	2138	2,951	48	2,138	
	CW-1-48	Excavation C	m3	1	3943	65	2857	3,943	65	2,857	
Others											
		Reporting and Test in General	L.S.	1			300000	0	0	300,000	
Indirect Cost											
Site Expense			%	15	0.8		0.2	37,934	0	6,322	
Profit and Overhead Cost			%	10	0.8		0.2	28,830	0	7,207	
		Miscellaneous	L.S.					82	48	64	Round Up
Total for	3 m3							76,100	200	320,300	
Unit Cost for	1 m3							25,367	67	106,767	

Table 4.2.5 (5/119) CALCULATION SHEET FOR UNIT COST OF EACH PAYMENT ITEM OF THREE PACKAGES

ID No.	Working Name	Calculation Quantity	Remarks
R-P1-Bq-15	Coffering and Dewatering	1 L.S.	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Material											
	M-B-9	Soil for Backfilling	m3	2310	0	400	7600	0	924,000	17,556,000	for Earth Filling
Working Base Cost											
	CW-3-9	Driving In of Steel Sheet Pile (Type-II)	m	15312	9909.06678	76.17755	8578.6692	151,727,631	1,166,431	131,356,583	Additional 4time
	CW-3-10	Pulling Out of Steel Sheet Pile (Type-II)	m	15312	9754	67	8548	149,353,248	1,025,904	130,886,976	Additional 4time
	CW-1-46	Excavation A	m3	1155	2361	39	1711	2,726,955	45,045	1,976,205	for Earth Filling
	CW-1-47	Excavation B	m3	577.5	2951	48	2138	1,704,203	27,720	1,234,695	for Earth Filling
	CW-1-48	Excavation C	m3	577.5	3943	65	2857	2,277,083	37,538	1,649,918	for Earth Filling
	CW-1-58	Spreading and Compaction for Earth Filling	m3	4620	2833.80293	36.252	2632.6181	13,092,170	167,484	12,162,696	for Earth Filling
	CW-4-8	Temporary Steel Sheet Pile (Type-C)	nos	638	1420686.26	85.90653	949534.95	906,397,835	54,808	605,803,297	
	CW-4-7	Sand Bags	nos	4116	88.5375	758.9625	4199.6625	364,420	3,123,890	17,285,811	
	CW-4-11	Temporary Double Steel Sheet Pile	m		11624101.3	15805.53	8175659.6	0	0	0	
	CW-4-12	Temporary Dewatering by D100mm	m	1020.8	291463.509	12974.4	212460.62	297,525,950	13,244,268	216,879,803	
Others											
Indirect Cost			%	15	0.8		0.2	321,813,428	0	80,453,357	
Site Expense			%	10	0.8		0.2	246,723,628	0	61,680,907	
Profit and Overhead Cost			L.S.					51	13	53	
		Miscellaneous									
Total for	1 L.S.							2,093,706,600	19,817,100	1,278,926,300	
Unit Cost for	1 L.S.							2,093,706,600	19,817,100	1,278,926,300	

ID No.	Working Name	Calculation Quantity	Remarks
R-P1-Bq-16	Clearing and Grubbing	10 m2	
R-P1-Bq-49	Clearing and Grubbing		
R-P1-Bq-69	Clearing and Grubbing		
R-P1-Bq-155	Clearing and Grubbing		
R-P1-Bq-197	Clearing and Grubbing		
R-P1-Bq-251	Clearing and Grubbing		
R-P1-Bq-285	Clearing and Grubbing		
R-P2-Bq-13	Clearing and Grubbing		

R-P1-Bq-364 Clearing and Grubbing

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Equipment											
	A-2-1-48	Dumptruck; 10 ton	hourly	0.2	77268.9961	3060	70744.121	15,454	612	14,149	
Working Base Cost											
	CW-1-46	Excavation A	m3	2	2361	39	1711	4,722	78	3,422	
	CW-1-5	Spreading A	m3	2	2941	35	2823	5,882	70	5,646	
Others											
		Pulling up roots of Plants	%	10				2,606	76	2,322	Inclusive of Tree cutting
Indirect Cost											
Site Expense			%	15	0.8		0.2	6,605	0	1,651	
Profit and Overhead Cost			%	10	0.8		0.2	5,064	0	1,266	
		Miscellaneous	L.S.					68	64	44	Round Up
Total for	10 m2							40,400	900	28,500	
Unit Cost for	1 m2							4,040	90	2,850	

*1 :	Soil Volume :	10 m2	x	0.2 m thick =		2 m3/10m2
*2 :	Dump Truck :	10 ton/dump	/	1.5 m3/ton =		6.67 m3/dump
		10 km/rnd /	30 km/hr +	20 mnts(loss)=		0.67 hours
		2 m3/10m2	/	6.67 m3/dump	=	0.3 dp/10m2
		0.3 dp/10m2	x	0.67 hours	=	0.2 hours

Table 4.2.5 (6/119) CALCULATION SHEET FOR UNIT COST OF EACH PAYMENT ITEM OF THREE PACKAGES

ID No.	Working Name	Calculation Quantity	Remarks
R-P1-Bq-17	Demolition of Existing Concrete Sheet Pile Wall Type Revetment	1 L.S.	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Equipment											
		Truck Crane; 11(10) ton, Oil									
	A-2-1-71	Pressure	hourly	60	99321.89	1020	85928.774	5,959,313	61,200	5,155,726	
	A-2-1-48	Dumptruck; 10 ton	hourly	80.4	77268.9961	3060	70744.121	6,212,427	246,024	5,687,827	
Working Base Cost											
		Pulling Out of Concrete Sheet									
	CW-3-20	Pile (t=22)	m	3600	85119	751	71916	306,428,400	2,703,600	258,897,600	
Indirect Cost											
Site Expense			%	15	0.8		0.2	70,962,254	0	17,740,564	
Profit and Overhead Cost			%	10	0.8		0.2	54,404,395	0	13,601,099	
		Miscellaneous	L.S.					10	76	84	Round Up
Total for	1 L.S.							443,966,800	3,010,900	301,082,900	
Unit Cost for	1 L.S.							443,966,800	3,010,900	301,082,900	

*1 : Sheet Pile Volume : 6 m x 300 m / 0.5 m/piece = 3600 m

*2 : 10 ton Dump Truck : 5 pcs/dump x 6 m = 30 m/dump
3600 m / 30 m/dump = 120 dump
10 km/rnd / 30 km/hr + 20 mnts(loss) = 0.67 hours
0.67 hours x 120 dump = 80.4 hours

*3 : Truck Crane : 10 pcs/TC/hour x 6 m = 60 m/TC/hour
3600 m / 60 m/TC/hour = 60 hours

ID No.	Working Name	Calculation Quantity	Remarks
R-P1-Bq-18	Demolition of Existing Concrete/Masonry Structures in River Channel	100 m3	
R-P1-Bq-50	Demolition of Existing Buttress Wall (Wet Stone Masonry)		
R-P1-Bq-70	Demolition of Existing Wet Masonry Wall		

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Equipment											
	A-2-1-7	Backhoe; 0.6 m3	hourly	8.33	125,543	2,040	90,965	1,045,772	16,993	757,739	
	A-2-2-35	Pick Hammer	daily	14.49	5716.91089	0	2030.0867	82,854	0	29,422	
	A-2-1-48	Dumptruck; 10 ton	hourly	19.58	77268.9961	3060	70744.121	1,512,927	59,915	1,385,170	
	A-2-2-17	Generator; 15 kVA	daily	3.62	82875	1800	52496.053	300,008	6,516	190,036	
Labour											
	L-2-1	Foreman	day	3.62	0	0	48800	0	0	176,812	
	L-2-10	Drill Worker	day	14.49	0	0	39000	0	0	565,217	
	L-2-23	Common Labour	day	14.49	0	0	35100	0	0	508,696	
Working Base Cost											
	CW-1-54	Excavation1	m3	100	5072	83	3675	507,200	8,300	367,500	
Indirect Cost											
Site Expense			%	15	0.8		0.2	902,529	0	225,632	
Profit and Overhead Cost			%	10	0.8		0.2	601,686	0	150,422	
		Miscellaneous	L.S.					24	76	55	Round Up
Total for	100 m3							4,953,000	91,800	4,356,700	
Unit Cost for	1 m3							49,530	918	43,567	

Manpower Composition; Foreman : 1 man/day
Common Labor : 4 man/day
Drill Worker : 4 man/day

*1 50m3 x Ta / (T x 60) x Composition of Manpower = Foreman 3.62, Drill Worker 14.49, Common 14.49

*2 100m3 x Tb / 60 = Dump Truck 19.58 hour

*3 50m3 x Ta / (T x 60) = Generator 3.62 days

*4 50m3 x Te / 60 = Backfoe 8.33 hour

*5 Average Daily Working Time of Generator, Laber, Breaker: T = 690 / 100 = 6.9 (hour/day)

Working Time by Hand Breaker / 1m3 (Ta): Ta = 30 minutes/m3

Working Time by Dump Truck / 1m3 (Tb): Tb = (5 km(one way) x 2 / 30 km/hour + 20 minutes) / 10 ton truck = 11.75 minutes/m3

Working Time by Backfoe and Pick Hammer / 1m3 (Te): Te = 10 minutes/m3

Table 4.2.5 (7/119) CALCULATION SHEET FOR UNIT COST OF EACH PAYMENT ITEM OF THREE PACKAGES

ID No. Working Name — Calculation Quantity — Remarks

R-P1-Bq-20 Excavation below Water Level (Low Water level shown on the cross sections) — 200 m3

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Equipment											
	A-2-1-48	Dumptruck; 10 ton	hourly	11.03	77,269	3,060	70,744	852,277	33,752	780,308	from Bank
	A-2-1-84	Tugboat; 15 ton	hourly	1.17	129,433	4,440	140,042	151,437	5,195	163,849	from Ship
		Soil Carriage Ship 200m3/s	daily	0.37	257,000	0	88,830	95,090	0	32,867	from Ship
	A-2-2-37	Pontoon Barge; 100 ton	daily	0.17	314,821	0	237,791	53,520	0	40,424	from Ship
	A-2-1-1	Backhoe; 2 m3 Long Arm	hourly	1.17	512,435	4,440	355,749	599,549	5,195	416,327	from Ship
Labour											
	L-2-1	Foreman	day	0.17	0	0	48,800	0	0	8,296	for Excavation by ship
	L-2-23	Common Labour	day	0.34	0	0	35,100	0	0	11,934	for Excavation by ship
Working Base Cost											
	CW-1-48	Excavation C	m3	100	3,943	65	2,857	394,300	6,500	285,700	
Others											
		Small Tools	%	5				107,309	2,532	86,980	
Indirect Cost											
Site Expense			%	15	0.8		0.2	495,989	0	123,997	
Profit and Overhead Cost			%	10	0.8		0.2	380,258	0	95,065	
		Miscellaneous	L.S.					72	27	53	
Total for	200 m3							3,129,800	53,200	2,045,700	
Unit Cost for	1 m3							15,649	266	10,229	

*1 : Backhoe & Tagboat & Pontoon — 1 hour = 3600 — q = 1.9 — f = 1

Q= 1hour x q x f x E / Cm (m3/hr) — E = work efficiency = 0.5 — Cm = 40 — Q = 85.5

Hence, Driving Time = 100 m3 / 85.5 = 1.17 hour/200m3 = 0.17 day/200m3

*2 : Soil Carriage Ship: 3 km / 5 km/hour (disposal) + 3 km / 10 km/hour (Returning) + 1.17 hour + 0.5 hour loss= 2.57 hour = 0.37 day/200m3

*3 : Dump Truck : 107 m3 / 6.5 m3/truck = 16.46 Truck

10 km/rnd / 30 km/hr + 20 mnts(loss)= 0.67 hours

16.46 Truck x 0.67 hours = 11.03 hours

*4 : Labor Rate : Foreman : 1 person/party Hence, 0.17

Common Labor : 2 person/party Hence, 0.34

ID No. Working Name — Calculation Quantity — Remarks

R-P1-Bq-21 Excavation above Water Level (Low Water level shown on the cross sections) — 10 m3

R-P1-Bq-25 Excavation above Water Level (Low Water level shown on the cross sections)

R-P1-Bq-20 Excavation below Water Level (Low Water level shown on the cross sections)

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Equipment											
	A-2-1-48	Dumptruck; 10 ton	hourly	1.04	77268.9961	3060	70744.121	80.360	3.182	73.574	
Working Base Cost											
	CW-1-47	Excavation B	m3	10	2951	48	2138	29,510	480	21,380	
Indirect Cost											
Site Expense			%	15	0.8		0.2	25,018	0	6,255	
Profit and Overhead Cost			%	10	0.8		0.2	19,181	0	4,795	
		Miscellaneous	L.S.					31	38	96	Round Up
Total for	10 m3							154,100	3,700	106,100	
Unit Cost for	1 m3							15,410	370	10,610	

*1 : Soil Volume : 10 m3

*2 : Dump Truck : 10 ton/dump / 1.5 m3/ton = 6.67 m3/dump

10.7 km/rnd / 30 km/hr + 20 mnts(loss)= 0.69 hours

10 m3 / 6.67 m3/dump = 1.5 dp/10m3

1.5 dp/10m3 x 0.69 hours = 1.04 hours

Table 4.2.5 (8/119) CALCULATION SHEET FOR UNIT COST OF EACH PAYMENT ITEM OF THREE PACKAGES

ID No.	Working Name	Calculation Quantity	Remarks
R-P1-Bq-22	Soft Rock Excavation	10 m3	
R-P1-Bq-26	Soft Rock Excavation		
R-P1-Bq-179	Soft Rock Excavation		
R-P2-Bq-23	Soft Rock Excavation		

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Equipment											
	A-2-1-7	Backhoe; 0.6 m3	hourly	0.83	125,543	2,040	90,965	104,201	1,693	75,501	
	A-2-2-16	Generator; 125 kVA	daily	0.12	271912.19	15120	209095.97	32,629	1,814	25,092	
	A-2-2-10	Concrete Breaker; 20 kg	daily	0.12	9136.07656	0	3181.3124	1,096	0	382	
	A-2-1-49	Dumptruck; 10 ton for Rock	hourly	1.47	84995.8957	3210	77194.516	124,944	4,719	113,476	
Working Base Cost											
	CW-1-54	Excavation I	m3	10	5072	83	3675	50,720	830	36,750	
Others											
Indirect Cost											
Site Expense			%	15	0.8		0.2	68,862	0	17,215	
Profit and Overhead Cost			%	10	0.8		0.2	52,794	0	13,198	
		Miscellaneous	L.S.					54	44	86	Round Up
Total for	10 m3							435,300	9,100	281,700	
Unit Cost for	1 m3							43,530	910	28,170	

*1 : Rock Volume : 10 m3

*2 : Dump Truck : 10 ton/dump / 2.2 m3/ton = 4.55 m3/dump

10 km/rnd / 30 km/hr + 20 mnts(loss) = 0.67 hours

10 m3 / 4.55 m3/dump = 2.2 dp/10m3

2.2 dp/10m3 x 0.67 hours = 1.47 hours

*3 10m3 x Tc / 60 = Generator, Backfoe and Breaker 0.83 hour 0.12 day

*4 Average Daily Working Time of Generator, Labor, Breaker $T = \frac{690}{100} = 6.9$ (hour/day)

Working Time by Backfoe and Breaker / 1m3 (Tc) Tc = 5 minutes/m3

ID No.	Working Name	Calculation Quantity	Remarks
R-P1-Bq-24	Excavation below Water Level (Low Water level shown on the cross sections)		
R-P2-Bq-19	Excavation below Water Level (Low water level shown on the cross sections)	10 m3	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Equipment											
	A-2-1-48	Dumptruck; 10 ton	hourly	1.04	77268.9961	3060	70744.121	80,360	3,182	73,574	
Working Base Cost											
	CW-1-48	Excavation C	m3	10	3943	65	2857	39,430	650	28,570	
Indirect Cost											
Site Expense			%	15	0.8		0.2	27,092	0	6,773	
Profit and Overhead Cost			%	10	0.8		0.2	20,770	0	5,193	
		Miscellaneous	L.S.					48	68	91	Round Up
Total for	10 m3							167,700	3,900	114,200	
Unit Cost for	1 m3							16,770	390	11,420	

*1 : Soil Volume : 10 m3

*2 : Dump Truck : 10 ton/dump / 1.5 m3/ton = 6.67 m3/dump

10.7 km/rnd / 30 km/hr + 20 mnts(loss) = 0.69 hours

10 m3 / 6.67 m3/dump = 1.5 dp/10m3

1.5 dp/10m3 x 0.69 hours = 1.04 hours

Table 4.2.5 (9/119) CALCULATION SHEET FOR UNIT COST OF EACH PAYMENT ITEM OF THREE PACKAGES

ID No.	Working Name	Calculation Quantity	Remarks
R-P1-Bq-28	Stripping of Top Soil, 250mm thick	10 m3	
R-P1-Bq-42	Stripping of Top Soil, 250mm thick		
R-P1-Bq-53	Stripping of Top Soil, 250mm thick		

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Equipment											
	A-2-1-48	Dumptruck; 10 ton	hourly	1.01	77268.9961	3060	70744.121	78,042	3,091	71,452	
Working Base Cost											
	CW-1-46	Excavation A	m3	10	2361	39	1711	23,610	390	17,110	
	CW-1-5	Spreading A	m3	10	2941	35	2823	29,410	350	28,230	
Indirect Cost											
Site Expense			%	15	0.8		0.2	30,202	0	7,551	
Profit and Overhead Cost			%	10	0.8		0.2	23,155	0	5,789	
		Miscellaneous	L.S.					81	69	69	Round Up
Total for	10 m3							184,500	3,900	130,200	
Unit Cost for	1 m3							18,450	390	13,020	

*1 : Soil Volume : 10 m3

*2 : Dump Truck : 10 ton/dump / 1.5 m3/ton = 6.67 m3/dump

10 km/rnd / 30 km/hr + 20 mnts(loss)= 0.67 hours

10 m3 / 6.67 m3/dump = 1.5 dp/10m3

1.5 dp/10m3 x 0.67 hours = 1.01 hours

ID No.	Working Name	Calculation Quantity	Remarks
R-P1-Bq-29	Embankment	10 m3	
R-P1-Bq-54	Embankment at the River Side Front of Floodwall	R-P1-Bq-202	Embankment for Dike
R-P1-Bq-242	Embankment for Dike	R-P1-Bq-349	Embankment
R-P1-Bq-355	Embankment		
R-P2-Bq-26	Embankment for Dike	R-P2-Bq-32	Embankment for Road

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Material											
		Sand for Filling and Base									
	M-B-4	Course	m3	3.33	0	1350	25650	0	4,496	85,415	
	M-B-2	Coarse Aggregate	m3	1.11	0	2600	49400	0	2,886	54,834	
	M-B-9	Soil for Backfilling	m3	6.67	0	400	7600	0	2,668	50,692	
Working Base Cost											
		Slope Clearing for									
	CW-1-9	Embankment 1	m2	50	2674	35	2902	133,700	1,750	145,100	
	CW-1-55	Spreading and Compaction-A	m3	10	1900.31294	22.6272	1938.6093	19,003	226	19,386	
Indirect Cost											
Site Expense			%	15	0.8		0.2	62,419	0	15,605	
Profit and Overhead Cost			%	10	0.8		0.2	47,854	0	11,964	
		Miscellaneous	L.S.					24	74	5	Round Up
Total for	10 m3							263,000	12,100	383,000	
Unit Cost for	1 m3							26,300	1,210	38,300	

*1 : Sand : 3 m3 / 0.9 = 3.33 m3

*2 : Aggregate : 1 m3 / 0.9 = 1.11 m3

*3 : Soil : 6 m3 / 0.9 = 6.67 m3

*4 : Slope Clearing Work : 1000 m2 / 200 m3 x10m3 = 50 m2/m3

ID No.	Working Name			Calculation Quantity	Remarks
R-P1-Bq-30	Solid Sodding	R-P1-Bq-55	Solid Sodding	10 m2	
R-P1-Bq-151	Solid Sodding	R-P1-Bq-203	Solid Sodding		
R-P1-Bq-243	Solid Sodding	R-P1-Bq-352	Solid Sodding		
R-P1-Bq-357	Solid Sodding				
R-P2-Bq-27	Solid Sodding				

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Working Base Cost											
	CW-1-14	Sodding	m2	10	0	0	5761	0	0	57,610	
Indirect Cost											
Site Expense			%	15	0.8		0.2	6,913	0	1,728	
Profit and Overhead Cost			%	10	0.8		0.2	5,300	0	1,325	
		Miscellaneous	L.S.					87	0	37	Round Up
Total for	10 m2							12,300	0	60,700	
Unit Cost for	1 m2							1,230	0	6,070	

Table 4.2.5 (10/119) CALCULATION SHEET FOR UNIT COST OF EACH PAYMENT ITEM OF THREE PACKAGES

ID No.	Working Name	Calculation Quantity	Remarks
R-P1-Bq-31	Gravel Pavement, 200mm thick	10 m2	
R-P1-Bq-350	Gravel Pavement, 200mm thick		

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
	M-B-12	Crushed Stone for Pavement and Concrete	m3	2.11	0	3250	61750	0	6,858	130,293	
Working Base Cost											
	CW-1-56	Spreading and Compaction for Gravel Pavement	m3	2	5117.46814	43.2	16431.167	10,234	86	32,862	
Indirect Cost											
Site Expense			%	15	0.8		0.2	21,640	0	5,410	
Profit and Overhead Cost			%	10	0.8		0.2	16,591	0	4,148	
		Miscellaneous	L.S.					35	56	88	Round Up
Total for	10 m2							48,500	7,000	172,800	
Unit Cost for	1 m2							4,850	700	17,280	

*1 : Crushed Stone : 10 m2 x 0.2 m thick / 0.95 = 2.11 m3

*2 : Spreading and Compaction : 10 m2 x 0.2 m thick = 2 m3

ID No.	Working Name					Calculation Quantity	Remarks
R-P1-Bq-33	Structural Excavation	R-P1-Bq-52	Structural Excavation			10 m3	
R-P1-Bq-72	Structural Excavation	R-P1-Bq-87	Structural Excavation			R-P1-Bq-91 Structural Excavation	
R-P1-Bq-102	Structural Excavation	R-P1-Bq-112	Structural Excavation			R-P1-Bq-123 Structural Excavation	
R-P1-Bq-130	Structural Excavation	R-P1-Bq-139	Structural Excavation			R-P1-Bq-157 Structural Excavation	
R-P1-Bq-178	Structural Excavation	R-P1-Bq-200	Structural Excavation			R-P1-Bq-216 Structural Excavation	
R-P1-Bq-231	Structural Excavation	R-P1-Bq-241	Structural Excavation			R-P1-Bq-254 Structural Excavation	
R-P1-Bq-287	Structural Excavation	R-P1-Bq-299	Structural Excavation			R-P1-Bq-311 Structural Excavation	
R-P1-Bq-321	Structural Excavation	R-P1-Bq-334	Structural Excavation			R-P1-Bq-348 Structural Excavation	
R-P1-Bq-354	Structural Excavation	R-P1-Bq-366	Structural Excavation				
R-P2-Bq-29	Structural Excavation	R-P2-Bq-191	Structural Excavation			R-P2-Bq-221 Structural Excavation	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Equipment											
	A-2-1-48	Dumptruck; 10 ton	hourly	1.01	77268.9961	3060	70744.121	78,042	3,091	71,452	
Working Base Cost											
	CW-1-5	Spreading A	m3	12	2941	35	2823	35,292	420	33,876	for Reclamation Site
	CW-1-46	Excavation A	m3	4	2361	39	1711	9,444	156	6,844	
	CW-1-47	Excavation B	m3	5	2951	48	2138	14,755	240	10,690	
	CW-1-6	Manpower Excavation	m3	1	0	0	15800	0	0	15,800	
Indirect Cost											
Site Expense			%	15	0.8		0.2	33,612	0	8,403	
Profit and Overhead Cost			%	10	0.8		0.2	25,769	0	6,442	
		Miscellaneous	L.S.					86	93	93	Round Up
Total for	10 m3							197,000	4,000	153,600	
Unit Cost for	1 m3							19,700	400	15,360	

*1 : Soil Volume : 10 m3

*2 : Dump Truck : 10 ton/dump / 1.5 m3/ton = 6.67 m3/dump

10 km/rnd / 30 km/hr + 20 mnts(loss) = 0.67 hours

10 m3 / 6.67 m3/dump = 1.5 dp/10m3

1.5 dp/10m3 x 0.67 hours = 1.01 hours

*3 : Spreading : 10 m3 x 1.2 = 12 m3

Table 4.2.5 (11/119) CALCULATION SHEET FOR UNIT COST OF EACH PAYMENT ITEM OF THREE PACKAGES

ID No.	Working Name			Calculation Quantity 10 m3	Remarks
R-P1-Bq-34	Backfill with Selected Soil	R-P1-Bq-56	Backfill with Selected Soil	R-P1-Bq-103	Backfill with Selected Soil
R-P1-Bq-73	Backfill with Selected Soil	R-P1-Bq-92	Backfill with Selected Soil	R-P1-Bq-140	Backfill with Selected Soil
R-P1-Bq-113	Backfill with Selected Soil	R-P1-Bq-124	Backfill with Selected Soil	R-P1-Bq-201	Backfill with Selected Soil
R-P1-Bq-158	Backfill with Selected Soil	R-P1-Bq-180	Backfill with Selected Soil	R-P1-Bq-247	Backfill with Selected Soil
R-P1-Bq-217	Backfill with Selected Soil	R-P1-Bq-232	Backfill with Selected Soil	R-P1-Bq-300	Backfill with Selected Soil
R-P1-Bq-255	Backfill with Selected Soil	R-P1-Bq-288	Backfill with Selected Soil	R-P1-Bq-335	Backfill with Selected Soil
R-P1-Bq-312	Backfill with Selected Soil	R-P1-Bq-322	Backfill with Selected Soil		
R-P1-Bq-367	Backfill with Selected Soil				
R-P2-Bq-25	Backfill with Selected Soil	R-P2-Bq-31	Backfill with Selected Soil	R-P2-Bq-192	Backfill with Selected Soil
R-P2-Bq-223	Backfill with Selected Soil				

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Material		Sand for Filling and Base									
	M-B-4	Course	m3	2.22	0	1350	25650	0	2,997	56,943	
	M-B-9	Soil for Backfilling	m3	8.89	0	400	7600	0	3,556	67,564	
Working Base Cost											
	CW-1-1	Backfill (Soil) A	m3	4	6076	87	5043	24,304	348	20,172	
	CW-1-2	Backfill (Soil) B	m3	3	7022	103	6326	21,066	309	18,978	
	CW-1-3	Backfill (Soil) C	m3	2	6392	98	6338	12,784	196	12,676	
	CW-1-4	Backfill (Soil) D	m3	2	6038	132	7114	12,076	264	14,228	
Indirect Cost											
Site Expense			%	15	0.8		0.2	32,215	0	8,054	
Profit and Overhead Cost			%	10	0.8		0.2	24,698	0	6,175	
		Miscellaneous	L.S.					56	30	11	Round Up
Total for		10 m3						127,200	7,700	204,800	
Unit Cost for		1 m3						12,720	770	20,480	

*1 : Sand : 2 m3 / 0.9 = 2.22 m3

*2 : Soil : 8 m3 / 0.9 = 8.89 m3

ID No.	Working Name			Calculation Quantity 10 m3	Remarks
R-P1-Bq-35	Gravel Bedding	R-P1-Bq-57	Gravel Bedding	R-P1-Bq-125	Gravel Bedding
R-P1-Bq-74	Gravel Bedding	R-P1-Bq-93	Gravel Bedding	R-P1-Bq-244	Gravel Bedding
R-P1-Bq-219	Gravel Bedding	R-P1-Bq-233	Gravel Bedding	R-P1-Bq-302	Gravel Bedding
R-P1-Bq-257	Gravel Bedding	R-P1-Bq-290	Gravel Bedding	R-P1-Bq-337	Gravel Bedding
R-P1-Bq-313	Gravel Bedding	R-P1-Bq-324	Gravel Bedding	R-P1-Bq-175	Gravel Bedding
R-P1-Bq-368	Gravel Bedding	R-P1-Bq-147	Gravel Bedding	R-P2-Bq-197	Gravel Bedding
R-P2-Bq-33	Gravel Bedding	R-P2-Bq-125	Gravel Bedding		
R-P1-Bq-181	Gravel Bedding for Main Body and Side Wall	R-P1-Bq-183	Gravel Bedding for Revetment		

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Working Base Cost											
	CW-1-15	Gravel Bedding	m3	10	0	1360	31260	0	13,600	312,600	
Indirect Cost											
Site Expense			%	15	0.8		0.2	39,144	0	9,786	
Profit and Overhead Cost			%	10	0.8		0.2	30,010	0	7,503	
		Miscellaneous	L.S.					46	0	11	Round Up
Total for		10 m3						69,200	13,600	329,900	
Unit Cost for		1 m3						6,920	1,360	32,990	

ID No.	Working Name			Calculation Quantity 10 m3	Remarks
R-P1-Bq-36	Wet Stone Masonry	R-P1-Bq-75	Wet Stone Masonry		
R-P1-Bq-116	Wet Stone Masonry	R-P1-Bq-126	Wet Stone Masonry	R-P1-Bq-220	Wet Stone Masonry
R-P1-Bq-234	Wet Stone Masonry	R-P1-Bq-245	Wet Stone Masonry	R-P1-Bq-265	Wet Stone Masonry
R-P1-Bq-289	Wet Stone Masonry				
R-P1-Bq-167	Wet Stone Masonry for Revetment	R-P1-Bq-182	Wet Stone Masonry for Main Body and Side Wall		
R-P1-Bq-184	Wet Stone Masonry for Revetment	R-P2-Bq-118	Wet Stone Masonry on Side Slope of 1:2 and 1:1.5		
R-P2-Bq-119	Wet Stone Masonry for Earth Retaining Type Wall in Downstream Channel				
R-P2-Bq-120	Wet Stone Masonry for Leaning Wall for Connecting Channel of Semarang River and Left Irrigation Channel				
R-P2-Bq-196	Wet Stone Masonry for Channel Revetment and Wall				
R-P2-Bq-231	Wet Stone Masonry				

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Working Base Cost											
	CW-2-15	Masonry of Crushed Stone, 1cement : 3sand	m3		0	22400	207600	0	0	0	
	CW-2-14	Masonry of Crushed Stone/Riverstone with 1cement : 2 sand	m3	10	0	28800	188500	0	288,000	1,885,000	
Indirect Cost											
Site Expense			%	15	0.8		0.2	260,760	0	65,190	
Profit and Overhead Cost			%	10	0.8		0.2	199,916	0	49,979	
		Miscellaneous	L.S.					24	0	31	Round Up
Total for		10 m3						460,700	288,000	2,000,200	
Unit Cost for		1 m3						46,070	28,800	200,020	

Table 4.2.5 (12/119) CALCULATION SHEET FOR UNIT COST OF EACH PAYMENT ITEM OF THREE PACKAGES

ID No.	Working Name			Calculation Quantity	Remarks
R-P1-Bq-37	Joint Filler, 10mm thick (Elastic Material)			10 m2	
R-P1-Bq-63	Joint Filler, 10mm thick (Elastic Material)	R-P1-Bq-80	Joint Filler, 10mm thick (Elastic Material)		
R-P1-Bq-98	Joint Filler, 10mm thick (Elastic Material)	R-P1-Bq-108	Joint Filler, 10mm thick (Elastic Material)		
R-P1-Bq-119	Joint Filler, 10mm thick (Elastic Material)	R-P1-Bq-128	Joint Filler, 10mm thick (Elastic Material)		
R-P1-Bq-166	Joint Filler, 10mm thick (Elastic Material)	R-P1-Bq-188	Joint Filler, 10mm thick (Elastic Material)		
R-P1-Bq-210	Joint Filler, 10mm thick (Elastic Material)	R-P1-Bq-225	Joint Filler, 10mm thick (Elastic Material)		
R-P1-Bq-267	Joint Filler, 10mm thick (Elastic Material)				
R-P1-Bq-293	Joint Filler, 10mm thick (Elastic Material)	R-P1-Bq-308	Joint Filler, 10mm thick (Elastic Material)		
R-P1-Bq-318	Joint Filler, 10mm thick (Elastic Material)	R-P1-Bq-330	Joint Filler, 10mm thick (Elastic Material)		
R-P1-Bq-343	Joint Filler, 10mm thick (Elastic Material)				
R-P2-Bq-72	Joint Filler 10mm thick (Elastic Material)	R-P2-Bq-85	Joint Filler, 10mm thick (Elastic Material)		
R-P2-Bq-107	Joint Filler, 10mm thick (Elastic Material)				
R-P2-Bq-115	Joint Filler, 10mm thick (Elastic Material)				
R-P2-Bq-200	Joint Filler 10mm thick (Elastic Material)	R-P2-Bq-233	Joint Filler 10mm thick (Elastic Material)		

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Labour											
	L-2-1	Foreman	day	0.05	0	0	48800	0	0	2,440	
	L-2-23	Common Labour	day	0.2	0	0	35100	0	0	7,020	
Material											
	M-G-12	Elastic Joint Filler 10mm thick	m2	11.11	0	8250	19250	0	91,658	213,868	
Others											
		Small Tolls and Material	%	1				0	917	2,233	Glue, Cutter and etc.
Indirect Cost											
Site Expense			%	15	0.8		0.2	38,176	0	9,544	
Profit and Overhead Cost			%	10	0.8		0.2	29,268	0	7,317	
		Miscellaneous	L.S.					55	26	78	Round Up
Total for	10 m2							67,500	92,600	242,500	
Unit Cost for	1 m2							6,750	9,260	24,250	

*1 :	Manpower ; Foreman :	1 man/day	/	200	m2/day x	10	m2	=	0.05
	Common Labor :	4 man/day	/	200	m2/day x	10	m2	=	0.2
	Common Labor :	1	manpower =	50	m2/day				
*2 :	Elastic Joint Filler :	10	m2	/	0.9	=	11.11		

ID No.	Working Name			Calculation Quantity	Remarks
R-P1-Bq-38	Water Stop, 200mm wide	R-P1-Bq-64	Water Stop, 200mm wide	100 m	
R-P1-Bq-165	Water Stop, 200mm wide	R-P1-Bq-209	Water Stop, 200 mm wide		
R-P2-Bq-114	Water Stop, 200mm wide				

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Labour											
	L-2-1	Foreman	day	0.25	0	0	48800	0	0	12,200	
	L-2-6	Welder	day	0.25	0	0	39000	0	0	9,750	
	L-2-23	Common Labour	day	1	0	0	35100	0	0	35,100	
Material											
	M-G-15	Waterstop; B=300mm	m	105.26	76000	0	4000	7,999,760	0	421,040	
Others											
		Small Tools	%	1				79,998	0	4,781	Welder Machine and etc.
Indirect Cost											
Site Expense			%	15	0.8		0.2	1,027,515	0	256,879	
Profit and Overhead Cost			%	10	0.8		0.2	787,762	0	196,940	
		Miscellaneous	L.S.					65	0	10	Round Up
Total for	100 m							9,895,100	0	936,700	
Unit Cost for	1 m							98,951	0	9,367	

*1 :	Manpower ; Foreman :	1 man/day	/	400	m/day x	100	m	=	0.25
	Common Labor :	4 man/day	/	400	m/day x	100	m	=	1
	Welder :	1 man/day	/	400	m/day x	100	m	=	0.25
	Common Labor :	1	manpower =	100	m/day				
*2 :	Water Stop :	100	m	/	0.95	=	105.26		

Table 4.2.5 (13/119) CALCULATION SHEET FOR UNIT COST OF EACH PAYMENT ITEM OF THREE PACKAGES

ID No. Working Name
R-P1-Bq-43 Earth Fill
R-P2-Bq-222 Earth Fill

Calculation Quantity: 10 m3 — Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Equipment	A-2-1-48	Dumptruck; 10 ton	hourly	0.6	77268.9961	3060	70744.121	46,361	1,836	42,446	
Working Base Cost											
	CW-1-58	Spreading and Compaction for Earth Filling	m3	10	2833.80293	36.252	2632.6181	28,338	363	26,326	
Indirect Cost											
Site Expense			%	15	0.8		0.2	17,480	0	4,370	
Profit and Overhead Cost			%	10	0.8		0.2	13,402	0	3,350	
		Miscellaneous	L.S.					18	1	7	Round Up
Total for	10 m3							105,600	2,200	76,500	
Unit Cost for	1 m3							10,560	220	7,650	

*1 : Dump Truck : 10 ton/dump / 1.5 m3/ton = 6.67 m3/dump
2 km/rod / 30 km/hr + 20 mnts(loss) = 0.4 hours
10 m3 / 6.67 m3/dump = 1.5 dp/10m3
1.5 dp/10m3 x 0.4 hours = 0.6 hours

ID No. Working Name
R-P1-Bq-45 Maintenance Marker Post, 500m interval on Right and Left River Banks

Calculation Quantity: 10 nos — Remarks

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Working Base Cost											
	CW-2-92	Wall Painting Work	m2	2	0	1200	18800	0	2,400	37,600	
	CW-2-38	Form Work for 1m3 of Concrete	m3	0.37	0	9600	821800	0	3,552	304,066	
	CW-2-35	Concrete Work with 1cement : 3sand : 6gravel	m3	0.37	0	26700	408800	0	9,879	151,256	
Indirect Cost											
Site Expense			%	15	0.8		0.2	61050.36	0	15262.59	
Profit and Overhead Cost			%	10	0.8		0.2	46805.276	0	11701.319	
		Miscellaneous	L.S.					44	69	14	Round Up
Total for	10 nos							107,900	15,900	519,900	
Unit Cost for	1 nos							10,790	1,590	51,990	

*1 : Concrete/1nos. 0.1 m x 0.1 m x 0.5 m
+ 0.4 m x 0.4 m x 0.2 m = 0.037 m3
*2 : Painting/1nos. 0.1 m x 0.5 m x 4 faces = 0.2 m2

Table 4.2.5 (14/119) CALCULATION SHEET FOR UNIT COST OF EACH PAYMENT ITEM OF THREE PACKAGES

ID No.	Working Name	Calculation Quantity	Remarks
R-P1-Bq-48	Coffering and Dewatering	1 L.S.	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Material											
	M-B-9	Soil for Backfilling	m3	727.7	0	400	7600	0	291,080	5,530,520	for Earth Filling
Working Base Cost											
	CW-1-46	Excavation A	m3	363.85	2361	39	1711	859,050	14,190	622,547	for Earth Filling
	CW-1-47	Excavation B	m3	181.925	2951	48	2138	536,861	8,732	388,956	for Earth Filling
	CW-1-48	Excavation C	m3	181.925	3943	65	2857	717,330	11,825	519,760	for Earth Filling
	CW-1-58	Spreading and Compaction for Earth Filling	m3	1455.4	2833.80293	36.252	2632.6181	4,124,317	52,761	3,831,512	for Earth Filling
	CW-4-8	Temporary Steel Sheet Pile (Type-C)	nos		1420686.26	85.90653	949534.95	0	0	0	
	CW-4-7	Sand Bags	nos		88.5375	758.9625	4199.6625	0	0	0	
	CW-4-11	Temporary Double Steel Sheet Pile	m		11624101.3	15805.53	8175659.6	0	0	0	
	CW-4-12	Temporary Dewatering by D100mm	m		291463.509	12974.4	212460.62	0	0	0	
Others											
Indirect Cost											
Site Expense			%	15	0.8		0.2	2,101,133	0	525,283	
Profit and Overhead Cost			%	10	0.8		0.2	1,400,755	0	350,189	
		Miscellaneous	L.S.					54	11	33	
Total for	1 L.S.							9,739,500	378,600	11,768,800	
Unit Cost for	1 L.S.							9,739,500	378,600	11,768,800	

ID No.	Working Name			Calculation Quantity	Remarks
R-P1-Bq-58	Chipping on Existing Floodwall Surface	R-P1-Bq-258	Chipping on Existing Structure	10 m2	
R-P2-Bq-110	Chiping of Existing Concrete				

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Labour											
	L-2-27	Chief of Mason	day	0.38	0	0	58600	0	0	22,268	
	L-2-11	Mason	day	3.8	0	0	39000	0	0	148,200	
Others											
		Small Tool	%	2				0	0	3,409	Graver, Hammer and etc.
Indirect Cost											
Site Expense			%	15	0.8		0.2	20,865	0	5,216	
Profit and Overhead Cost			%	10	0.8		0.2	15,997	0	3,999	
		Miscellaneous	L.S.					38	0	7	Round Up
Total for	10 m2							36,900	0	183,100	
Unit Cost for	1 m2							3,690	0	18,310	

*1 : Manpower ; Chief of Mason : 0.038 man/m2 x 10 m2 = 0.38
Mason : 0.38 man/m2 x 10 m2 = 3.8
Mason : 0.38 person day /m2

*2 : Rate of Mason is quated from Japanese Standard. (P2109)

*3 : Rate of Chieef of Mason is assumption.

Table 4.2.5 (15/119) CALCULATION SHEET FOR UNIT COST OF EACH PAYMENT ITEM OF THREE PACKAGES

ID No.	Working Name			Calculation Quantity	Remarks
				10 m3	
R-P1-Bq-59	Concrete, Type C1 including Formwork				
R-P1-Bq-77	Concrete, Type C1 including Formwork	R-P1-Bq-96	Concrete, Type C1 including Formwork		
R-P1-Bq-169	Concrete, Type C1 for Revetment including Formwork	R-P1-Bq-163	Concrete for Side Wall, Type C1 including Formwork		
R-P1-Bq-186	Concrete Type C1 including Formwork for Revetment				
R-P1-Bq-222	Concrete, Type C1 including Formwork	R-P1-Bq-238	Concrete, Type C1 including Formwork		
R-P1-Bq-260	Concrete, Type C1 including Formwork	R-P1-Bq-304	Concrete, Type C1 including Formwork		
R-P1-Bq-296	Concrete Type C1 including Formwork				
R-P1-Bq-314	Concrete, Type C1 including Formwork	R-P1-Bq-325	Concrete, Type C1 including Formwork		
R-P1-Bq-340	Concrete, Type C1 including Formwork				

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Equipment											
	A-2-1-79	Truck Mixer; 4.5 m3	hourly	3.17	77957.8757	1560	60651.605	247,126	4,945	192,266	
Working Base Cost											
	CW-1-23	Form Work A	m2	26.06373	60	0	44798	1,564	0	1,167,603	
	CW-2-40	Breaking-up the Concrete Form Concrete Work for Type-C by	m2	26.06373	0	0	3700	0	0	96,436	
	CW-1-60	Shoot Hopper	m3	10	120	43660	197860	1,200	436,600	1,978,600	
Indirect Cost											
Site Expense			%	15	0.8		0.2	495,161	0	123,790	
Profit and Overhead Cost			%	10	0.8		0.2	379,623	0	94,906	
		Miscellaneous	L.S.					26	55	100	Round Up
Total for		10 m3						1,124,700	441,600	3,653,700	
Unit Cost for		1 m3						112,470	44,160	365,370	

*1 : Total Concrete Volume : 5201.003 m3
*2 : Total Formwork Area : 13555.76 m2
Average Formwork Area : 26.06373 m2/unit m3
*3 : Dump Truck : 10.7 m3 / 4.5 m3/truck = 2.38 Truck
10 km/trd / 30 km/hr + 60 mnts(loss) = 1.33 hours
2.38 Truck x 1.33 hours = 3.17 hours

	Cn	Fm
R-P1-Bq-57	4555.336	10363.65
R-P1-Bq-75	1899.444	
R-P1-Bq-91	308.945	1217.582
R-P1-Bq-156	62.949	228.65
R-P1-Bq-162	65.591	408.742
R-P1-Bq-177	19.064	128.136
R-P1-Bq-212	22.433	129.488
R-P1-Bq-228	12.321	74.37
R-P1-Bq-270.5	44.014	358.456
R-P1-Bq-276	14.635	106.365
R-P1-Bq-288	34.311	218.961
R-P1-Bq-300	37.329	192.506
R-P1-Bq-314	24.075	128.85

ID No.	Working Name			Calculation Quantity	Remarks
				1000 kg	
R-P1-Bq-60	Deformed Reinforcing Bars for C.2.8				
R-P1-Bq-78	Deformed Reinforcing Bars for Item D.2.6	R-P1-Bq-97	Deformed Reinforcing Bars for D.4.6		
R-P1-Bq-164	Deformed Reinforcing Bars for Side Wall	R-P1-Bq-170	Deformed Reinforcing Bars for Revetment		
R-P1-Bq-187	Deformed Reinforcing Bars for Revetment	R-P1-Bq-208	Deformed Reinforcing Bars for Item F.2.7		
R-P1-Bq-223	Deformed Reinforcing Bars for F.3.7	R-P1-Bq-239	Deformed Reinforcing Bars for Item F.4.7 and F.4.8		
R-P1-Bq-264	Deformed Reinforcing Bars for G.2.7				
R-P1-Bq-297	Deformed Reinforcing Bar for Item H.2.10	R-P1-Bq-306	Deformed Reinforcing Bars for Item H.3.6 and H.3.7		
R-P1-Bq-327	Deformed Reinforcing Bars for Item H.5.5 and H.5.6	R-P1-Bq-342	Deformed Reinforcing Bars for Item H.6.7 and H.6.8		
R-P1-Bq-316	Deformed Reinforcing Bars for Item H.4.4 and H.4.5	R-P2-Bq-68	Deformed Reinforcing Bar for Item E.1.8		
R-P2-Bq-70	Steel Anchor Bars for Item E.1.10	R-P2-Bq-75	Steel Anchor Bars for Maintenance Step and Control House Erection		
R-P2-Bq-81	Deformed Reinforcing Bar for Item E.2.4				
R-P2-Bq-230	Deformed Reinforcing Bars for Item L.2.8				

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Working Base Cost											
	CW-1-31	Reinforcing Bar Setup 2	t	1	0	2808810	2992590	0	2,808,810	2,992,590	
Indirect Cost											
Site Expense			%	15	0.8		0.2	696,168	0	174,042	
Profit and Overhead Cost			%	10	0.8		0.2	533,729	0	133,432	
		Miscellaneous	L.S.					3	90	36	Round Up
Total for		1000 kg						1,229,900	2,808,900	3,300,100	
Unit Cost for		1 kg						1,230	2,809	3,300	

Table 4.2.5 (16/119) CALCULATION SHEET FOR UNIT COST OF EACH PAYMENT ITEM OF THREE PACKAGES

ID No.	Working Name	Calculation Quantity	Remarks
R-P1-Bq-61	Furnishing and Driving Log Pile, Dia. 150m R-P1-Bq-79	Furnishing and Driving Log Pile, Dia. 150mm, L=2	10 m
R-P1-Bq-256	Furnishing and Driving Log Pile, Dia. 150m R-P1-Bq-301	Furnishing and Driving Log Pile, Dia. 150mm, L=2.0m	
R-P1-Bq-323	Furnishing and Driving Log Pile, Dia. 150m R-P1-Bq-346	Furnishing and Driving Log Pile, Dia. 150mm, L=2.0m	
R-P2-Bq-123	Furnishing and Driving Log Pile, Dia. 150mm, L=2.0m		

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Material											
	M-D-1	Log Pile, Dia. 15cm	m	10	0	0	10000	0	0	100,000	
Working Base Cost											
	CW-3-12	Driving In of Log Pile	piece	10	24435.5098	362.3243	18529.948	244,355	3,623	185,299	
Indirect Cost											
Site Expense			%	15	0.8		0.2	63,993	0	15,998	
Profit and Overhead Cost			%	10	0.8		0.2	49,062	0	12,265	
		Miscellaneous	L.S.					90	77	37	Round Up
Total for	10 m							357,500	3,700	313,600	
Unit Cost for	1 m							35,750	370	31,360	

ID No.	Working Name	Calculation Quantity	Remarks
R-P1-Bq-62	Drilling, Anchoring Steel Bars in Existing Floodwall and Filling the Hole with Non-shrinkage Mortar	10 nos.	
R-P1-Bq-268	Drilling, Anchoring Steel Bars in Existing Floodwall and Filling the Hole with Non-shirinkage Mortar		
R-P1-Bq-294	Drilling, Anchoring Steel Bars in Existing Floodwall and Filling the Hole with Non-shirinkage Mortar		

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Labour											
	L-2-1	Foreman	day	0.33	0	0	48800	0	0	16,104	
	L-2-17	Concrete Worker	day	0.67	0	0	39000	0	0	26,130	
	L-2-23	Common Labour	day	0.67	0	0	35100	0	0	23,517	
Material											
	0	0			0	0	0	0	0	0	
	M-E-1	Reinforcing Bar, Round U-30	kg	6.32	0	2500	2500	0	15,800	15,800	
	M-C-45	Non Shrinkage Mortar	m3	0.05	0	18260	73040	0	913	3,652	
Others											
		Tools	%	20				0	3,343	17,041	Hand Drill, Generator and etc
Indirect Cost											
Site Expense			%	15	0.8		0.2	14,676	0	3,669	
Profit and Overhead Cost			%	10	0.8		0.2	11,252	0	2,813	
		Miscellaneous	L.S.					73	44	75	Round Up
Total for	10 nos.							26,000	20,100	108,800	
Unit Cost for	1 nos.							2,600	2,010	10,880	

Manpower ; Foreman :	1 man/day	/	30	nos/day x	10	m	=	0.33	
Common Labor :	2 man/day	/	30	nos/day x	10	m	=	0.67	
Concrete Worker :	2 man/day	/	30	nos/day x	10	m	=	0.67	
Concrete Worker :	1 manpower =		15	nos/day					
Reinforcing Bar :	0.4 m/nos x	1.58	kg/m x	10	nos	=	6.32 kg		
Nonshrinkage Mortar :	0.005 m3/nos x			10	nos	=	0.05 m3		

ID No.	Working Name	Calculation Quantity	Remarks
R-P1-Bq-65	Cement Mortar Plastering on Roadside Surface of Floodwall	10 m2	
R-P1-Bq-235	Mortar Plastering on Surface of Wet Stone Masonry		
R-P1-Bq-269	Plastering on Surface of Wet Masonry		
R-P1-Bq-291	Cement Mortar Plastering		

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Working Base Cost											
	CW-2-44	Plastering 15mm thickness with Icement : 2sand	m2	10	0	1200	10000	0	12,000	100,000	
Indirect Cost											
Site Expense			%	15	0.8		0.2	13,440	0	3,360	
Profit and Overhead Cost			%	10	0.8		0.2	10,304	0	2,576	
		Miscellaneous	L.S.					56	0	64	Round Up
Total for	10 m2							23,800	12,000	106,000	
Unit Cost for	1 m2							2,380	1,200	10,600	

Table 4.2.5 (17/119) CALCULATION SHEET FOR UNIT COST OF EACH PAYMENT ITEM OF THREE PACKAGES

ID No.	Working Name	Calculation Quantity	Remarks
R-P1-Bq-68	Coffering and Dewatering	1 L.S.	

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Material											
	M-B-9	Soil for Backfilling	m3	32.55	0	400	7600	0	13,020	247,380	for Earth Filling
Working Base Cost											
	CW-1-46	Excavation A	m3	16.275	2361	39	1711	38,425	635	27,847	for Earth Filling
	CW-1-47	Excavation B	m3	8.1375	2951	48	2138	24,014	391	17,398	for Earth Filling
	CW-1-48	Excavation C	m3	8.1375	3943	65	2857	32,086	529	23,249	for Earth Filling
	CW-1-58	Spreading and Compaction for Earth Filling	m3	65.1	2833.80293	36.252	2632.6181	184,481	2,360	171,383	for Earth Filling
	CW-4-8	Temporary Steel Sheet Pile (Type-C)	nos	320	1420686.26	85.90653	949534.95	454,619,604	27,490	303,851,184	
	CW-4-7	Sand Bags	nos	2048	88.5375	758.9625	4199.6625	181,325	1,554,355	8,600,909	
	CW-4-11	Temporary Double Steel Sheet Pile	m		11624101.3	15805.53	8175659.6	0	0	0	
	CW-4-12	Temporary Dewatering by D100mm	m		291463.509	12974.4	212460.62	0	0	0	
Others											
Indirect Cost											
Site Expense			%	15	0.8		0.2	92,354,168	0	23,088,542	
Profit and Overhead Cost			%	10	0.8		0.2	70,804,862	0	17,701,215	
		Miscellaneous	L.S.					37	20	93	
Total for		1 L.S.						618,239,000	1,598,800	353,729,200	
Unit Cost for		1 L.S.						618,239,000	1,598,800	353,729,200	

ID No.	Working Name	Calculation Quantity	Remarks
R-P1-Bq-39	Cement Mortar Pointing on Riverside Surface of Wet Stone Masonry	10 m2	
R-P1-Bq-76	Cement Mortar Pointing on Riverside Surface of Wet Stone Masonry		
R-P1-Bq-117	Cement Mortar Pointing on Riverside Surface of Wet Stone Masonry		
R-P1-Bq-127	Cement Mortar Pointing on Riverside Surface of Wet Stone Masonry		
R-P2-Bq-122	Cement Mortar Pointing on Riverside Surface of Wet Stone Masonry		
R-P1-Bq-168	Cement Mortar Pointing on Riverside Surface of Wet Stone Masonry		
R-P1-Bq-185	Cement Mortar Pointing on Riverside Surface of Wet Stone Masonry		
R-P1-Bq-221	Cement Mortar Pointing on Riverside Surface of Wet Stone Masonry		
R-P1-Bq-246	Cement Mortar Pointing on Surface of Wet Stone Masonry		
R-P1-Bq-266	Cement Mortar Pointing on Riverside Surface of Wet Stone Masonry		
R-P1-Bq-292	Cement Mortar Poiting on Riverside Surface of Wet Stone Masonry		
R-P2-Bq-199	Cement Mortar Pointing on Surface of Wet Stone Masonry		
R-P2-Bq-232	Cement Mortar Pointing on Riverside Surface of Masonry		

Major Item	ID No.	Description	Unit	Quantity	Unit Cost PF/C	Unit Cost IF/C	Unit Cost L/C	Cost PF/C	Cost IF/C	Cost L/C	Remarks
Direct Cost											
Working Base Cost											
	CW-2-44	Plastering 15mm thickness with 1cement : 2sand	m2	7	0	1200	10000	0	8,400	70,000	
Others											
		Extra Cost for Labor	%	20				0	1,680	14,000	
Indirect Cost											
Site Expense			%	15	0.8		0.2	11,290	0	2,822	
Profit and Overhead Cost			%	10	0.8		0.2	8,655	0	2,164	
		Miscellaneous	L.S.					55	20	14	Round Up
Total for		10 m2						20,000	10,100	89,000	
Unit Cost for		1 m2						2,000	1,010	8,900	

*1 : Pointing 70 % of All Area of Wall