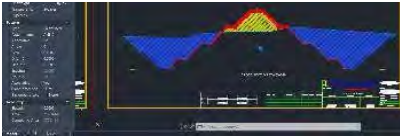
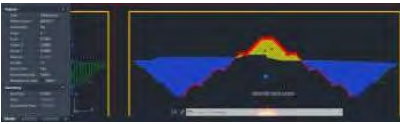
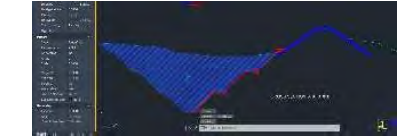

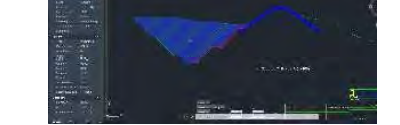

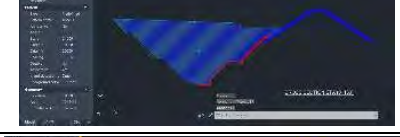


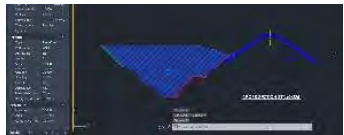
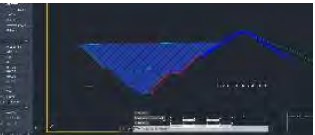

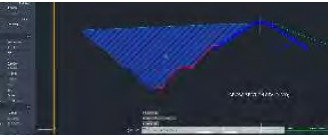




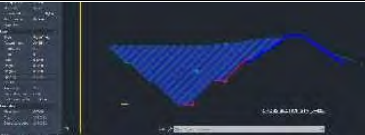
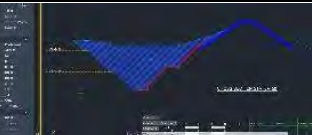


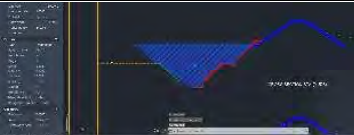
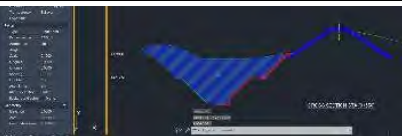
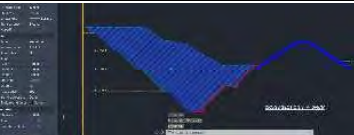





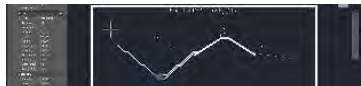





Name Structure :		: Dike Leprak 22				
Type of work		: Sand Excavation				
No.	Description	Calculation	Volume	Unit	Drawing Reference	
1	No. 0	Area = 377.34 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 4716.75 m <sup>3</sup>				
		Total Volume =	4,716.75	m <sup>3</sup>		
2	No. 1	Area = 410.65 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 9849.85 m <sup>3</sup>				
		Total Volume =	9,849.85	m <sup>3</sup>		
3	No. 2	Area = 298.46 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 8863.90 m <sup>3</sup>				
		Total Volume =	8,863.90	m <sup>3</sup>		
4	No. 3	Area = 339.51 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 7974.70 m <sup>3</sup>				
		Total Volume =	7,974.70	m <sup>3</sup>		
5	No. 4	Area = 197.79 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 6716.32 m <sup>3</sup>				
		Total Volume =	6,716.32	m <sup>3</sup>		
6	No. 5	Area = 217.44 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 5190.40 m <sup>3</sup>				
		Total Volume =	5,190.40	m <sup>3</sup>		
7	No. 6	Area = 234.55 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 5649.81 m <sup>3</sup>				
		Total Volume =	5,649.81	m <sup>3</sup>		
8	No. 7	Area = 230.70 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 5601.75 m <sup>3</sup>				
		Total Volume =	5,601.75	m <sup>3</sup>		
9	No. 8	Area = 242.29 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 5960.50 m <sup>3</sup>				
		Total Volume =	5,960.50	m <sup>3</sup>		

Name Structure :		: Dike Leprak 22				
Type of work		: Sand Excavation				
No.	Description	Calculation	Volume	Unit	Drawing Reference	
10	No. 9	Area = 221.20 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 5793.70 m <sup>3</sup>				
		Total Volume =	5,793.70	m <sup>3</sup>		
11	No. 10	Area = 231.18 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 5654.82 m <sup>3</sup>				
		Total Volume =	5,654.82	m <sup>3</sup>		
12	No. 11	Area = 278.04 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 6365.36 m <sup>3</sup>				
		Total Volume =	6,365.36	m <sup>3</sup>		
13	No. 12	Area = 289.57 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 7095.13 m <sup>3</sup>				
		Total Volume =	7,095.13	m <sup>3</sup>		
14	No. 13	Area = 295.37 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 7311.74 m <sup>3</sup>				
		Total Volume =	7,311.74	m <sup>3</sup>		
15	No. 14	Area = 282.96 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 7229.20 m <sup>3</sup>				
		Total Volume =	7,229.20	m <sup>3</sup>		
16	No. 15	Area = 224.84 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 6347.49 m <sup>3</sup>				
		Total Volume =	6,347.49	m <sup>3</sup>		
17	No. 16	Area = 283.52 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 6354.43 m <sup>3</sup>				
		Total Volume =	6,354.43	m <sup>3</sup>		
18	No. 17	Area = 264.03 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 6844.39 m <sup>3</sup>				
		Total Volume =	6,844.39	m <sup>3</sup>		
19	No. 18	Area = 171.63 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 5445.74 m <sup>3</sup>				
		Total Volume =	5,445.74	m <sup>3</sup>		



Name Structure :		: Dike Leprak 22					
Type of work		: Sand Excavation					
No.	Description	Calculation	Volume	Unit	Drawing Reference		
20	No. 19	Area = 161.94 m <sup>2</sup> Length = 25.00 m' Volume = <b>4169.58</b> m <sup>3</sup>					
		Total Volume =	4,169.58	m <sup>3</sup>			
21	No. 20	Area = 160.90 m <sup>2</sup> Length = 25.00 m' Volume = <b>4035.46</b> m <sup>3</sup>					
		Total Volume =	4,035.46	m <sup>3</sup>			
22	No. 21	Area = 164.48 m <sup>2</sup> Length = 25.00 m' Volume = <b>4067.24</b> m <sup>3</sup>					
		Total Volume =	4,067.24	m <sup>3</sup>			
23	No. 22	Area = 169.48 m <sup>2</sup> Length = 25.00 m' Volume = <b>4174.58</b> m <sup>3</sup>					
		Total Volume =	4,174.58	m <sup>3</sup>			
24	No. 23	Area = 315.52 m <sup>2</sup> Length = 25.00 m' Volume = <b>6062.58</b> m <sup>3</sup>					
		Total Volume =	6,062.58	m <sup>3</sup>			
<b>Sand Excavation Total Volume =</b>			<b>147,475.41</b>	<b>m<sup>3</sup></b>			

Name Structure :		: Dike Leprak 22					
Type of work		: Backfill					
No.	Description	Calculation	Volume	Unit	Drawing Reference		
1	No. 0	Area =	5.25	m <sup>2</sup>			
		Length =	25.00	m'			
		Volume =	65.63	m <sup>3</sup>			
		Total Volume =			65.63		m <sup>3</sup>
2	No. 1	Area =	5.25	m <sup>2</sup>			
		Length =	25.00	m'			
		Volume =	131.25	m <sup>3</sup>			
		Total Volume =			131.25		m <sup>3</sup>
3	No. 2	Area =	2.63	m <sup>2</sup>			
		Length =	25.00	m'			
		Volume =	98.44	m <sup>3</sup>			
		Total Volume =			98.44		m <sup>3</sup>
4	No. 3	Area =	2.63	m <sup>2</sup>			
		Length =	25.00	m'			
		Volume =	65.63	m <sup>3</sup>			
		Total Volume =			65.63		m <sup>3</sup>
5	No. 4	Area =	2.63	m <sup>2</sup>			
		Length =	25.00	m'			
		Volume =	65.63	m <sup>3</sup>			
		Total Volume =			65.63		m <sup>3</sup>
6	No. 5	Area =	2.63	m <sup>2</sup>			
		Length =	25.00	m'			
		Volume =	65.63	m <sup>3</sup>			
		Total Volume =			65.63		m <sup>3</sup>
7	No. 6	Area =	2.63	m <sup>2</sup>			
		Length =	25.00	m'			
		Volume =	65.63	m <sup>3</sup>			
		Total Volume =			65.63		m <sup>3</sup>
8	No. 7	Area =	2.63	m <sup>2</sup>			
		Length =	25.00	m'			
		Volume =	65.63	m <sup>3</sup>			
		Total Volume =			65.63		m <sup>3</sup>
9	No. 8	Area =	2.63	m <sup>2</sup>			
		Length =	25.00	m'			
		Volume =	65.63	m <sup>3</sup>			
		Total Volume =			65.63		m <sup>3</sup>

Name Structure :		: Dike Leprak 22						
Type of work :		: Backfill						
No.	Description	Calculation	Volume	Unit	Drawing Reference			
10	No. 9	Area = 2.63	m <sup>2</sup>					
		Length = 25.00	m'					
		Volume = 65.63	m <sup>3</sup>					
		Total Volume =		65.63				m <sup>3</sup>
11	No. 10	Area = 2.63	m <sup>2</sup>					
		Length = 25.00	m'					
		Volume = 65.63	m <sup>3</sup>					
		Total Volume =		65.63				m <sup>3</sup>
12	No. 11	Area = 2.63	m <sup>2</sup>					
		Length = 25.00	m'					
		Volume = 65.63	m <sup>3</sup>					
		Total Volume =		65.63				m <sup>3</sup>
13	No. 12	Area = 2.63	m <sup>2</sup>					
		Length = 25.00	m'					
		Volume = 65.63	m <sup>3</sup>					
		Total Volume =		65.63				m <sup>3</sup>
14	No. 13	Area = 2.63	m <sup>2</sup>					
		Length = 25.00	m'					
		Volume = 65.63	m <sup>3</sup>					
		Total Volume =		65.63				m <sup>3</sup>
15	No. 14	Area = 2.63	m <sup>2</sup>					
		Length = 25.00	m'					
		Volume = 65.63	m <sup>3</sup>					
		Total Volume =		65.63				m <sup>3</sup>
16	No. 15	Area = 2.63	m <sup>2</sup>					
		Length = 25.00	m'					
		Volume = 65.63	m <sup>3</sup>					
		Total Volume =		65.63				m <sup>3</sup>
17	No. 16	Area = 2.63	m <sup>2</sup>					
		Length = 25.00	m'					
		Volume = 65.63	m <sup>3</sup>					
		Total Volume =		65.63				m <sup>3</sup>
18	No. 17	Area = 2.63	m <sup>2</sup>					
		Length = 25.00	m'					
		Volume = 65.63	m <sup>3</sup>					
		Total Volume =		65.63				m <sup>3</sup>
19	No. 18	Area = 2.63	m <sup>2</sup>					
		Length = 25.00	m'					
		Volume = 65.63	m <sup>3</sup>					
		Total Volume =		65.63				m <sup>3</sup>

Name Structure :		: Dike Leprak 22					
Type of work		: Backfill					
No.	Description	Calculation	Volume	Unit	Drawing Reference		
20	No. 19	Area = 2.63 m <sup>2</sup>					
		Length = 25.00 m'					
		Volume = 65.63 m <sup>3</sup>					
		Total Volume =	65.63	m <sup>3</sup>			
21	No. 20	Area = 2.63 m <sup>2</sup>					
		Length = 25.00 m'					
		Volume = 65.63 m <sup>3</sup>					
		Total Volume =	65.63	m <sup>3</sup>			
22	No. 21	Area = 2.63 m <sup>2</sup>					
		Length = 25.00 m'					
		Volume = 65.63 m <sup>3</sup>					
		Total Volume =	65.63	m <sup>3</sup>			
23	No. 22	Area = 2.63 m <sup>2</sup>					
		Length = 25.00 m'					
		Volume = 65.63 m <sup>3</sup>					
		Total Volume =	65.63	m <sup>3</sup>			
24	No. 23	Area = 2.63 m <sup>2</sup>					
		Length = 25.00 m'					
		Volume = 65.63 m <sup>3</sup>					
		Total Volume =	65.63	m <sup>3</sup>			
			<b>Backfill Total Volume =</b>	<b>1,673.44</b>	<b>m<sup>3</sup></b>		

Name Structure :		: Dike Leprak 22				
Type of work		: Concrete K-225				
No.	Description	Calculation	Volume	Unit	Drawing Reference	
1	No. 0	Area = 42.46 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 530.75 m <sup>3</sup>				
		Total Volume =	530.75	m <sup>3</sup>		
2	No. 1	Area = 43.52 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 1074.76 m <sup>3</sup>				
		Total Volume =	1,074.76	m <sup>3</sup>		
3	No. 2	Area = 16.95 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 755.92 m <sup>3</sup>				
		Total Volume =	755.92	m <sup>3</sup>		
4	No. 3	Area = 17.49 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 430.57 m <sup>3</sup>				
		Total Volume =	430.57	m <sup>3</sup>		
5	No. 4	Area = 11.87 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 367.08 m <sup>3</sup>				
		Total Volume =	367.08	m <sup>3</sup>		
6	No. 5	Area = 11.92 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 297.44 m <sup>3</sup>				
		Total Volume =	297.44	m <sup>3</sup>		
7	No. 6	Area = 11.97 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 298.68 m <sup>3</sup>				
		Total Volume =	298.68	m <sup>3</sup>		
8	No. 7	Area = 12.02 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 299.30 m <sup>3</sup>				
		Total Volume =	299.30	m <sup>3</sup>		
9	No. 8	Area = 12.12 m <sup>2</sup>				
		Length = 25.00 m'				
		Volume = 301.15 m <sup>3</sup>				
		Total Volume =	301.15	m <sup>3</sup>		

Name Structure :		: Dike Leprak 22				
Type of work		: Concrete K-225				
No.	Description	Calculation	Volume	Unit	Drawing Reference	
10	No. 9	Area = 12.17 m <sup>2</sup> Length = 25.00 m' Volume = 303.59 m <sup>3</sup>				
		Total Volume =	303.59	m <sup>3</sup>		
11	No. 10	Area = 12.22 m <sup>2</sup> Length = 25.00 m' Volume = 304.83 m <sup>3</sup>				
		Total Volume =	304.83	m <sup>3</sup>		
12	No. 11	Area = 12.27 m <sup>2</sup> Length = 25.00 m' Volume = 306.08 m <sup>3</sup>				
		Total Volume =	306.08	m <sup>3</sup>		
13	No. 12	Area = 12.32 m <sup>2</sup> Length = 25.00 m' Volume = 307.32 m <sup>3</sup>				
		Total Volume =	307.32	m <sup>3</sup>		
14	No. 13	Area = 12.37 m <sup>2</sup> Length = 25.00 m' Volume = 308.58 m <sup>3</sup>				
		Total Volume =	308.58	m <sup>3</sup>		
15	No. 14	Area = 12.42 m <sup>2</sup> Length = 25.00 m' Volume = 309.82 m <sup>3</sup>				
		Total Volume =	309.82	m <sup>3</sup>		
16	No. 15	Area = 12.47 m <sup>2</sup> Length = 25.00 m' Volume = 311.05 m <sup>3</sup>				
		Total Volume =	311.05	m <sup>3</sup>		
17	No. 16	Area = 12.52 m <sup>2</sup> Length = 25.00 m' Volume = 312.29 m <sup>3</sup>				
		Total Volume =	312.29	m <sup>3</sup>		
18	No. 17	Area = 12.57 m <sup>2</sup> Length = 25.00 m' Volume = 313.53 m <sup>3</sup>				
		Total Volume =	313.53	m <sup>3</sup>		
19	No. 18	Area = 12.62 m <sup>2</sup> Length = 25.00 m' Volume = 314.77 m <sup>3</sup>				
		Total Volume =	314.77	m <sup>3</sup>		




Name Structure :		: Dike Leprak 22				
Type of work		: Concrete K-225				
No.	Description	Calculation	Volume	Unit	Drawing Reference	
20	No. 19	Area = 12.66 m <sup>2</sup> Length = 25.00 m' Volume = 316.00 m <sup>3</sup>				
		Total Volume =	316.00	m <sup>3</sup>		
21	No. 20	Area = 12.71 m <sup>2</sup> Length = 25.00 m' Volume = 317.24 m <sup>3</sup>				
		Total Volume =	317.24	m <sup>3</sup>		
22	No. 21	Area = 12.81 m <sup>2</sup> Length = 25.00 m' Volume = 319.10 m <sup>3</sup>				
		Total Volume =	319.10	m <sup>3</sup>		
23	No. 22	Area = 12.76 m <sup>2</sup> Length = 25.00 m' Volume = 319.71 m <sup>3</sup>				
		Total Volume =	319.71	m <sup>3</sup>		
24	No. 23	Area = 12.81 m <sup>2</sup> Length = 25.00 m' Volume = 319.71 m <sup>3</sup>				
		Total Volume =	319.71	m <sup>3</sup>		
<b>Concrete K-225 Total Volume =</b>			<b>9,039.27</b>	<b>m<sup>3</sup></b>		

Name Structure :		: Dike Leprak 22					
Type of work		: Cyclops Concrete					
No.	Description	Calculation	Volume	Unit	Drawing Reference		
1	No. 0	Area = 61.30	m <sup>2</sup>		34.46	m <sup>3</sup>	
		Length = 25.00	m'				
		Volume = 34.46	m <sup>3</sup>				
		Total Volume =					
2	No. 1	Area = 64.25	m <sup>2</sup>		1,569.33	m <sup>3</sup>	
		Length = 25.00	m'				
		Volume = 1569.33	m <sup>3</sup>				
		Total Volume =					
3	No. 2	Area = 0.00	m <sup>2</sup>		803.11	m <sup>3</sup>	
		Length = 25.00	m'				
		Volume = 803.11	m <sup>3</sup>				
		Total Volume =					
4	No. 3	Area = 0.00	m <sup>2</sup>		-	m <sup>3</sup>	
		Length = 25.00	m'				
		Volume = 0.00	m <sup>3</sup>				
		Total Volume =					
5	No. 4	Area = 0.00	m <sup>2</sup>		-	m <sup>3</sup>	
		Length = 25.00	m'				
		Volume = 0.00	m <sup>3</sup>				
		Total Volume =					
6	No. 5	Area = 0.00	m <sup>2</sup>		-	m <sup>3</sup>	
		Length = 25.00	m'				
		Volume = 0.00	m <sup>3</sup>				
		Total Volume =					
7	No. 6	Area = 0.00	m <sup>2</sup>		-	m <sup>3</sup>	
		Length = 25.00	m'				
		Volume = 0.00	m <sup>3</sup>				
		Total Volume =					
8	No. 7	Area = 0.00	m <sup>2</sup>		-	m <sup>3</sup>	
		Length = 25.00	m'				
		Volume = 0.00	m <sup>3</sup>				
		Total Volume =					
9	No. 8	Area = 0.00	m <sup>2</sup>		-	m <sup>3</sup>	
		Length = 25.00	m'				
		Volume = 0.00	m <sup>3</sup>				
		Total Volume =					

Name Structure :		: Dike Leprak 22			
Type of work		: Cyclops Concrete			
No.	Description	Calculation	Volume	Unit	Drawing Reference
10	No. 9	Area = 0.00	m <sup>2</sup>		
		Length = 25.00	m'		
		Volume = 0.00	m <sup>3</sup>		
		Total Volume =		-	m <sup>3</sup>
11	No. 10	Area = 0.00	m <sup>2</sup>		
		Length = 25.00	m'		
		Volume = 0.00	m <sup>3</sup>		
		Total Volume =		-	m <sup>3</sup>
12	No. 11	Area = 0.00	m <sup>2</sup>		
		Length = 25.00	m'		
		Volume = 0.00	m <sup>3</sup>		
		Total Volume =		-	m <sup>3</sup>
13	No. 12	Area = 0.00	m <sup>2</sup>		
		Length = 25.00	m'		
		Volume = 0.00	m <sup>3</sup>		
		Total Volume =		-	m <sup>3</sup>
14	No. 13	Area = 0.00	m <sup>2</sup>		
		Length = 25.00	m'		
		Volume = 0.00	m <sup>3</sup>		
		Total Volume =		-	m <sup>3</sup>
15	No. 14	Area = 0.00	m <sup>2</sup>		
		Length = 25.00	m'		
		Volume = 0.00	m <sup>3</sup>		
		Total Volume =		-	m <sup>3</sup>
<b>Cyclop Concrete Total Volume =</b>			<b>2,406.89</b>	<b>m<sup>3</sup></b>	




Name Structure :		: Dike Leprak 22			
Type of work		: Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	No. 0	Formwork Length = 55.08 m Length = 25.00 m' Volume = <b>813.54</b> m <sup>2</sup>			
		Total Volume =	813.54	m <sup>2</sup>	
2	No. 1	Formwork Length = 67.20 m Length = 25.00 m' Volume = <b>1653.60</b> m <sup>2</sup>			
		Total Volume =	1,653.60	m <sup>2</sup>	
3	No. 2	Formwork Length = 26.59 m Length = 25.00 m' Volume = <b>1172.46</b> m <sup>2</sup>			
		Total Volume =	1,172.46	m <sup>2</sup>	
4	No. 3	Formwork Length = 27.65 m Length = 25.00 m' Volume = <b>678.06</b> m <sup>2</sup>			
		Total Volume =	678.06	m <sup>2</sup>	
5	No. 4	Formwork Length = 18.66 m Length = 25.00 m' Volume = <b>578.93</b> m <sup>2</sup>			
		Total Volume =	578.93	m <sup>2</sup>	
6	No. 5	Formwork Length = 18.76 m Length = 25.00 m' Volume = <b>467.79</b> m <sup>2</sup>			
		Total Volume =	467.79	m <sup>2</sup>	
7	No. 6	Formwork Length = 18.86 m Length = 25.00 m' Volume = <b>470.27</b> m <sup>2</sup>			
		Total Volume =	470.27	m <sup>2</sup>	
8	No. 7	Formwork Length = 18.96 m Length = 25.00 m' Volume = <b>471.51</b> m <sup>2</sup>			
		Total Volume =	471.51	m <sup>2</sup>	
9	No. 8	Formwork Length = 19.06 m Length = 25.00 m' Volume = <b>473.98</b> m <sup>2</sup>			
		Total Volume =	473.98	m <sup>2</sup>	
10	No. 9	Formwork Length = 19.16 m Length = 25.00 m' Volume = <b>477.69</b> m <sup>2</sup>			
		Total Volume =	477.69	m <sup>2</sup>	

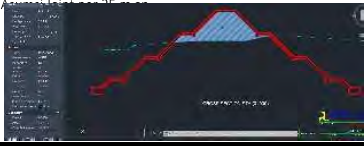

Name Structure :		: Dike Leprak 22				
Type of work		: Exposed Formwork				
No.	Description	Calculation	Volume	Unit	Drawing Reference	
11	No. 10	Formwork Length = 19.26 m Length = 25.00 m' Volume = <b>480.17</b> m <sup>2</sup>				
		Total Volume =	480.17	m <sup>2</sup>		
12	No. 11	Formwork Length = 19.36 m Length = 25.00 m' Volume = <b>482.64</b> m <sup>2</sup>				
		Total Volume =	482.64	m <sup>2</sup>		
13	No. 12	Formwork Length = 19.45 m Length = 25.00 m' Volume = <b>485.12</b> m <sup>2</sup>				
		Total Volume =	485.12	m <sup>2</sup>		
14	No. 13	Formwork Length = 19.55 m Length = 25.00 m' Volume = <b>487.59</b> m <sup>2</sup>				
		Total Volume =	487.59	m <sup>2</sup>		
15	No. 14	Formwork Length = 19.65 m Length = 25.00 m' Volume = <b>490.07</b> m <sup>2</sup>				
		Total Volume =	490.07	m <sup>2</sup>		
16	No. 15	Formwork Length = 19.75 m Length = 25.00 m' Volume = <b>492.54</b> m <sup>2</sup>				
		Total Volume =	492.54	m <sup>2</sup>		
17	No. 16	Formwork Length = 19.85 m Length = 25.00 m' Volume = <b>495.02</b> m <sup>2</sup>				
		Total Volume =	495.02	m <sup>2</sup>		
18	No. 17	Formwork Length = 19.95 m Length = 25.00 m' Volume = <b>497.49</b> m <sup>2</sup>				
		Total Volume =	497.49	m <sup>2</sup>		
19	No. 18	Formwork Length = 20.05 m Length = 25.00 m' Volume = <b>499.97</b> m <sup>2</sup>				
		Total Volume =	499.97	m <sup>2</sup>		
20	No. 19	Formwork Length = 20.15 m Length = 25.00 m' Volume = <b>502.44</b> m <sup>2</sup>				
		Total Volume =	502.44	m <sup>2</sup>		
21	No. 20	Formwork Length = 20.25 m Length = 25.00 m' Volume = <b>504.92</b> m <sup>2</sup>				
		Total Volume =	504.92	m <sup>2</sup>		

Name Structure :		: Dike Leprak 22			
Type of work		: Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
22	No. 21				
	Formwork Length =	20.35 m			
	Length =	25.00 m'			
	Volume =	507.39 m <sup>2</sup>			
	Total Volume =		507.39	m <sup>2</sup>	
23	No. 22				
	Formwork Length =	20.44 m			
	Length =	25.00 m'			
	Volume =	509.87 m <sup>2</sup>			
	Total Volume =		509.87	m <sup>2</sup>	
24	No. 23				
	Formwork Length =	20.54 m			
	Length =	25.00 m'			
	Volume =	512.34 m <sup>2</sup>			
	Total Volume =		512.34	m <sup>2</sup>	
<b>Exposed Formwork Total Volume =</b>			<b>14,205.39</b>	<b>m<sup>2</sup></b>	

Name Structure :		: Dike Leprak 22			
Type of work		: Non Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	No. 0	Formwork Length = 16.54 m Length = 25.00 m' Volume = 206.75 m <sup>2</sup>			
		Total Volume =	206.75	m <sup>2</sup>	
2	No. 1	Formwork Length = 23.62 m Length = 25.00 m' Volume = 502.03 m <sup>2</sup>			
		Total Volume =	502.03	m <sup>2</sup>	
3	No. 2	Formwork Length = 0.00 m Length = 25.00 m' Volume = 295.28 m <sup>2</sup>			
		Total Volume =	295.28	m <sup>2</sup>	
4	No. 3	Formwork Length = 0.00 m Length = 25.00 m' Volume = 0.00 m <sup>2</sup>			
		Total Volume =	-	m <sup>2</sup>	
5	No. 4	Formwork Length = 0.00 m Length = 25.00 m' Volume = 0.00 m <sup>2</sup>			
		Total Volume =	-	m <sup>2</sup>	
6	No. 5	Formwork Length = 0.00 m Length = 25.00 m' Volume = 0.00 m <sup>2</sup>			
		Total Volume =	-	m <sup>2</sup>	
7	No. 6	Formwork Length = 0.00 m Length = 25.00 m' Volume = 0.00 m <sup>2</sup>			
		Total Volume =	-	m <sup>2</sup>	
8	No. 7	Formwork Length = 0.00 m Length = 25.00 m' Volume = 0.00 m <sup>2</sup>			
		Total Volume =	-	m <sup>2</sup>	
9	No. 8	Formwork Length = 0.00 m Length = 25.00 m' Volume = 0.00 m <sup>2</sup>			
		Total Volume =	-	m <sup>2</sup>	
10	No. 9	Formwork Length = 0.00 m Length = 25.00 m' Volume = 0.00 m <sup>2</sup>			
		Total Volume =	-	m <sup>2</sup>	

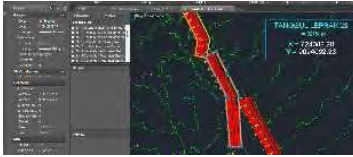
Name Structure :		: Dike Leprak 22			
Type of work		: Non Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
11	No. 10	Formwork Length = 0.00 m			
		Length = 25.00 m'			
		Volume = 0.00 m <sup>2</sup>			
		Total Volume =	-	m <sup>2</sup>	
12	No. 11	Formwork Length = 0.00 m			
		Length = 25.00 m'			
		Volume = 0.00 m <sup>2</sup>			
		Total Volume =	-	m <sup>2</sup>	
13	No. 12	Formwork Length = 0.00 m			
		Length = 25.00 m'			
		Volume = 0.00 m <sup>2</sup>			
		Total Volume =	-	m <sup>2</sup>	
14	No. 13	Formwork Length = 0.00 m			
		Length = 25.00 m'			
		Volume = 0.00 m <sup>2</sup>			
		Total Volume =	-	m <sup>2</sup>	
15	No. 14	Formwork Length = 0.00 m			
		Length = 25.00 m'			
		Volume = 0.00 m <sup>2</sup>			
		Total Volume =	-	m <sup>2</sup>	
16	No. 15	Formwork Length = 0.00 m			
		Length = 25.00 m'			
		Volume = 0.00 m <sup>2</sup>			
		Total Volume =	-	m <sup>2</sup>	
17	No. 16	Formwork Length = 0.00 m			
		Length = 25.00 m'			
		Volume = 0.00 m <sup>2</sup>			
		Total Volume =	-	m <sup>2</sup>	
18	No. 17	Formwork Length = 0.00 m			
		Length = 25.00 m'			
		Volume = 0.00 m <sup>2</sup>			
		Total Volume =	-	m <sup>2</sup>	
19	No. 18	Formwork Length = 0.00 m			
		Length = 25.00 m'			
		Volume = 0.00 m <sup>2</sup>			
		Total Volume =	-	m <sup>2</sup>	
20	No. 19	Formwork Length = 0.00 m			
		Length = 25.00 m'			
		Volume = 0.00 m <sup>2</sup>			
		Total Volume =	-	m <sup>2</sup>	
21	No. 20	Formwork Length = 0.00 m			
		Length = 25.00 m'			
		Volume = 0.00 m <sup>2</sup>			
		Total Volume =	-	m <sup>2</sup>	

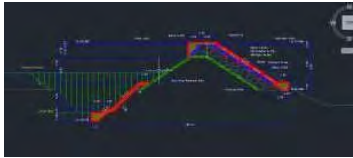
Name Structure :		: Dike Leprak 22			
Type of work		: Non Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
22	No. 21				
	Formwork Length =	0.00 m			
	Length =	25.00 m'			
	Volume =	0.00 m <sup>2</sup>			
	Total Volume =		-	m <sup>2</sup>	
23	No. 22				
	Formwork Length =	0.00 m			
	Length =	25.00 m'			
	Volume =	0.00 m <sup>2</sup>			
	Total Volume =		-	m <sup>2</sup>	
24	No. 23				
	Formwork Length =	0.00 m			
	Length =	25.00 m'			
	Volume =	0.00 m <sup>2</sup>			
	Total Volume =		-	m <sup>2</sup>	
25	Joint Formwork No. 0				Asumsi Joint per 25 m an
	Area =	61.30 m <sup>2</sup>			
	Volume =	61.30 m <sup>2</sup>			
	Total Volume =		61.30	m <sup>2</sup>	
26	Joint Formwork No. 1				Asumsi Joint per 25 m an
	Area =	64.25 m <sup>2</sup>			
	Volume =	64.25 m <sup>2</sup>			
	Total Volume =		64.25	m <sup>2</sup>	
27	Joint Formwork No. 2				Asumsi Joint per 25 m an
	Area =	64.25 m <sup>2</sup>			
	Volume =	64.25 m <sup>2</sup>			
	Total Volume =		64.25	m <sup>2</sup>	
<b>Non Exposed Formwork Total Volume =</b>			<b>1,193.85</b>	<b>m<sup>2</sup></b>	

Name Structure :		: Leprak 22 Dike			
Type of work		: Joint Filler			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	Joint Formwork No. 1				
	Area =	61.30 m <sup>2</sup>			
	Volume =	61.30 m <sup>2</sup>			
	Total Volume =		61.30	m <sup>2</sup>	
2	Joint Formwork No. 2				
	Area =	64.25 m <sup>2</sup>			
	Volume =	64.25 m <sup>2</sup>			
	Total Volume =		64.25	m <sup>2</sup>	
		<b>Joint Filler Volume =</b>	<b>125.55</b>	<b>m<sup>2</sup></b>	
		<b>Thickness =</b>	<b>0.02</b>	<b>m</b>	
		<b>Joint Filler Total Volume =</b>	<b>2.51</b>	<b>m<sup>3</sup></b>	


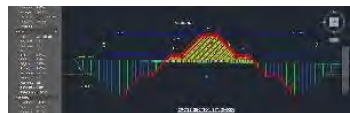
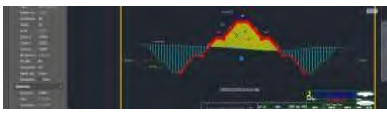
SUMMARY QUANTITY DIKE LEPRAK 23			
No.	Description	Unit	Volume
1	Stake Out	m2	11,900.00
2	Excavation Cross Profile	m	529.10
3	Bowplank	m	650.00
4	Mechanical Sand Excavation	m3	61,579.05
5	Concrete Making and Casting f' = 20 Mpa (K 225) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	9,113.29
6	Cyclops Concrete 60% Concrete f' 15 Mpa: 40% Split Stone, with Concrete Pump (CP)	m3	11,154.98
7	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	9,815.25
8	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	3,121.60
9	1 kg Slab reinforcement for BjTP or BjTS diameter > 12 mm Semi-Mechanical method	Kg	198,532.18
10	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	12,936.85
11	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	9,815.25
12	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	3,121.60
13	Geotextile	m2	4,500.00
14	Joint Filler	m3	7.70
15	1 kg Achor Bolt	Kg	36,134.41
16	BackFill	m3	1,214.06

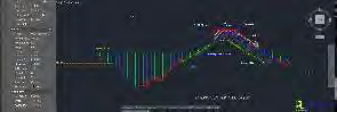
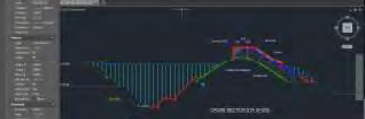
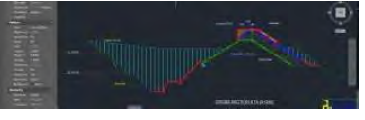
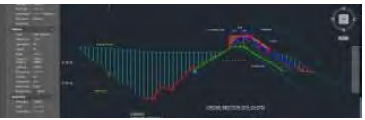

Name Structure : : Dike Leprak 23  
 Type of work : Stake Out

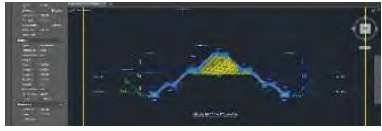

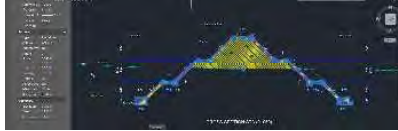
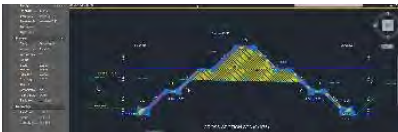




No.	Description	Calculation	Volume	Unit	Drawing Reference
1	Area =	11900.00	11,900.00	m <sup>2</sup>	
		Total Area Stake Out =	11,900.00	m <sup>2</sup>	


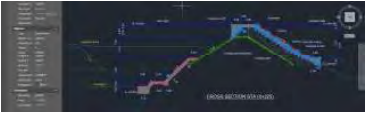
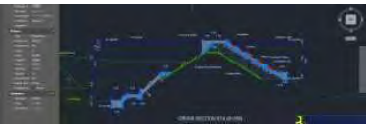


Name Structure : : Dike Leprak 23					
Type of work : Cross Profile					
No.	Description	Calculation	Volume	Unit	Drawing Reference
1					
	Numbers of Section =	13.00	529.10	m	
	Cross Length =	40.700			
		<b>Cross Profile Total Volume =</b>	<b>529.10</b>	<b>m</b>	

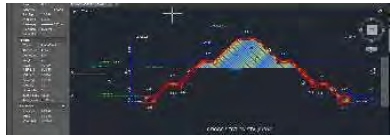
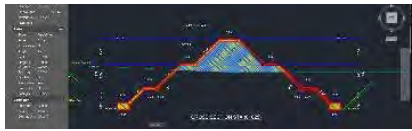
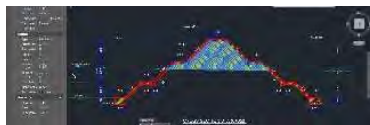
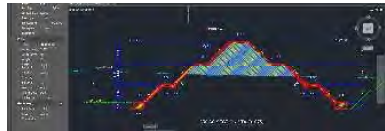
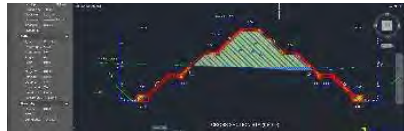

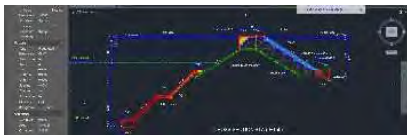
Name Structure : : Dike Leprak 23					
Type of work : Bowplank					
No.	Description	Calculation	Volume	Unit	Drawing Reference
1					
	Profile Length =	606.00	650.00	m	
	Cross Section Length	44.00			
		<b>Bowplank Total Volume =</b>	<b>650.00</b>	<b>m'</b>	





Name Structure :		: Dike Leprak 23			
Type of work		: Sand Excavation			
No.	Description	Calculation	Volume	Unit	Drawing reference
1	No. 0				
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m'			
	V=	0.00 m <sup>3</sup>			
	Total Volume =		-	m <sup>3</sup>	
2	No. 1				
	Area =	191.04 m <sup>2</sup>			
	Length =	25.00 m'			
	V=	2387.99 m <sup>3</sup>			
	Total Volume =		2,387.99	m <sup>3</sup>	
3	No. 2				
	Area =	196.68 m <sup>2</sup>			
	Length =	25.00 m'			
	V=	4846.50 m <sup>3</sup>			
	Total Volume =		4,846.50	m <sup>3</sup>	
4	No. 3				
	Area =	183.97 m <sup>2</sup>			
	Length =	25.00 m'			
	V=	4758.10 m <sup>3</sup>			
	Total Volume =		4,758.10	m <sup>3</sup>	
5	No. 4				
	Area =	169.62 m <sup>2</sup>			
	Length =	25.00 m'			
	V=	4419.87 m <sup>3</sup>			
	Total Volume =		4,419.87	m <sup>3</sup>	
6	No. 5				
	Area =	181.55 m <sup>2</sup>			
	Length =	25.00 m'			
	V=	4389.63 m <sup>3</sup>			
	Total Volume =		4,389.63	m <sup>3</sup>	
7	No. 6				
	Area =	163.80 m <sup>2</sup>			
	Length =	25.00 m'			
	V=	4316.82 m <sup>3</sup>			
	Total Volume =		4,316.82	m <sup>3</sup>	
8	No. 7				
	Area =	265.94 m <sup>2</sup>			
	Length =	25.00 m'			
	V=	5593.59 m <sup>3</sup>			
	Total Volume =		5,593.59	m <sup>3</sup>	
9	No. 8				
	Area =	144.45 m <sup>2</sup>			
	Length =	25.00 m'			
	V=	3853.14 m <sup>3</sup>			
	Total Volume =		3,853.14	m <sup>3</sup>	

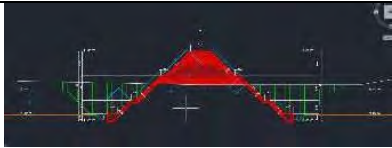
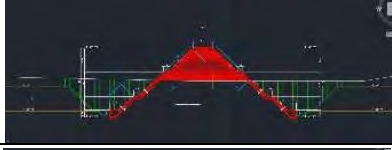

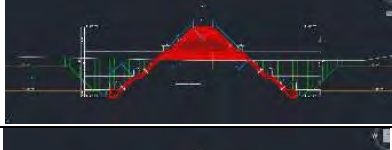
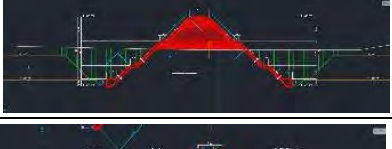

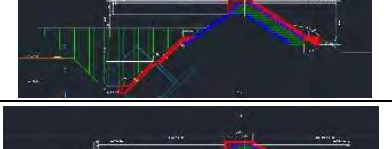

Name Structure :		: Dike Leprak 23					
Type of work		: Sand Excavation					
No.	Description	Calculation	Volume	Unit	Drawing reference		
10	No. 9						
	Area =	137.32 m <sup>2</sup>					
	Length =	25.00 m'					
	V=	3522.23 m <sup>3</sup>					
	Total Volume =		3,522.23	m <sup>3</sup>			
11	No. 10						
	Area =	172.36 m <sup>2</sup>					
	Length =	25.00 m'					
	V=	3871.11 m <sup>3</sup>					
	Total Volume =		3,871.11	m <sup>3</sup>			
12	No. 11						
	Area =	195.53 m <sup>2</sup>					
	Length =	25.00 m'					
	V=	4598.71 m <sup>3</sup>					
	Total Volume =		4,598.71	m <sup>3</sup>			
13	No. 12						
	Area =	231.70 m <sup>2</sup>					
	Length =	25.00 m'					
	V=	5340.41 m <sup>3</sup>					
	Total Volume =		5,340.41	m <sup>3</sup>			
14	No. 13						
	Area =	271.39 m <sup>2</sup>					
	Length =	25.00 m'					
	V=	6288.60 m <sup>3</sup>					
	Total Volume =		6,288.60	m <sup>3</sup>			
15	No. 14						
	Area =	0.00 m <sup>2</sup>					
	Length =	25.00 m'					
	V=	3392.35 m <sup>3</sup>					
	Total Volume =		3,392.35	m <sup>3</sup>			
<b>San Excavation Total Volume =</b>				<b>61,579.05</b>	<b>m<sup>3</sup></b>		

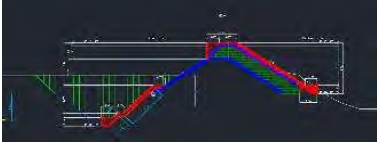
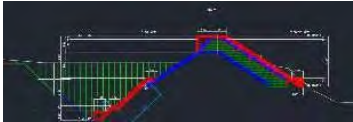
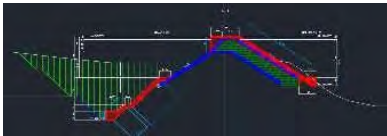
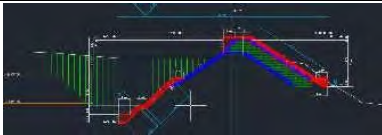
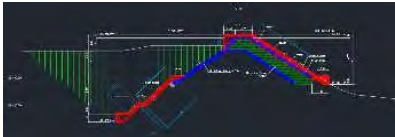
Name Structure :		: Dike Leprak 23				
Type of work		: Concrete K-225				
No.	Description	Calculation	Volume	Unit	Drawing reference	
1	No. 0					
	Area =	0.00 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	0.00 m <sup>3</sup>				
	Total Volume =		-	m <sup>3</sup>		
2	No. 1					
	Area =	33.32 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	416.44 m <sup>3</sup>				
	Total Volume =		416.44	m <sup>3</sup>		
3	No. 2					
	Area =	33.84 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	839.47 m <sup>3</sup>				
	Total Volume =		839.47	m <sup>3</sup>		
4	No. 3					
	Area =	34.37 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	852.61 m <sup>3</sup>				
	Total Volume =		852.61	m <sup>3</sup>		
5	No. 4					
	Area =	34.89 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	865.69 m <sup>3</sup>				
	Total Volume =		865.69	m <sup>3</sup>		
6	No. 5					
	Area =	35.41 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	878.78 m <sup>3</sup>				
	Total Volume =		878.78	m <sup>3</sup>		
7	No. 6					
	Area =	24.39 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	747.55 m <sup>3</sup>				
	Total Volume =		747.55	m <sup>3</sup>		
8	No. 7					
	Area =	24.65 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	750.82 m <sup>3</sup>				
	Total Volume =		750.82	m <sup>3</sup>		
9	No. 8					
	Area =	21.17 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	569.54 m <sup>3</sup>				
	Total Volume =		569.54	m <sup>3</sup>		

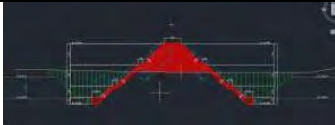
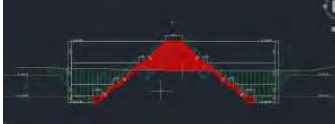
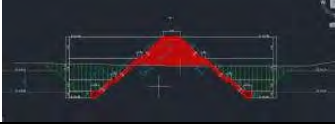
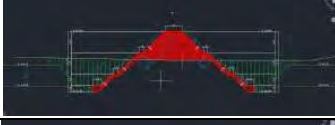
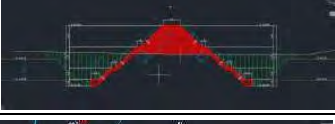

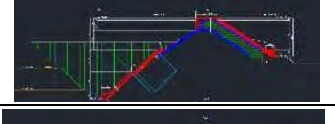

Name Structure :		: Dike Leprak 23				
Type of work		: Concrete K-225				
No.	Description	Calculation	Volume	Unit	Drawing reference	
10	No. 9					
	Area =	21.62 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	534.89 m <sup>3</sup>				
	Total Volume =		534.89	m <sup>3</sup>		
11	No. 10					
	Area =	21.82 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	542.97 m <sup>3</sup>				
	Total Volume =		542.97	m <sup>3</sup>		
12	No. 11					
	Area =	21.83 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	545.57 m <sup>3</sup>				
	Total Volume =		545.57	m <sup>3</sup>		
13	No. 12					
	Area =	22.21 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	550.52 m <sup>3</sup>				
	Total Volume =		550.52	m <sup>3</sup>		
14	No. 13					
	Area =	22.41 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	557.81 m <sup>3</sup>				
	Total Volume =		557.81	m <sup>3</sup>		
15	No. 14					
	Area =	0.00 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	280.14 m <sup>3</sup>				
	Total Volume =		280.14	m <sup>3</sup>		
Kolom Concrete Frame						
Area =	6.68 m <sup>2</sup>					
Width =	0.50 m'					
V=	1.67 m <sup>3</sup>					
Numbers =	108.00 pcs					
Total Volume =		180.49	m <sup>3</sup>			
<b>Concrete K-225 Total Volume =</b>					<b>9,113.29 m<sup>3</sup></b>	

Name Structure :		: Dike Leprak 23				
Type of work		: Cyclop Concrete				
No.	Description	Calculation	Volume	Unit	Drawing reference	
1	No. 0					
	Area =	0.00 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	0.00 m <sup>3</sup>				
	Total Volume =			- m <sup>3</sup>		
2	No. 1					
	Area =	66.09 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	826.14 m <sup>3</sup>				
	Total Volume =		826.14	m <sup>3</sup>		
3	No. 2					
	Area =	66.27 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	1654.47 m <sup>3</sup>				
	Total Volume =		1,654.47	m <sup>3</sup>		
4	No. 3					
	Area =	75.83 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	1776.17 m <sup>3</sup>				
	Total Volume =		1,776.17	m <sup>3</sup>		
5	No. 4					
	Area =	92.31 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	2101.68 m <sup>3</sup>				
	Total Volume =		2,101.68	m <sup>3</sup>		
6	No. 5					
	Area =	104.23 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	2456.71 m <sup>3</sup>				
	Total Volume =		2,456.71	m <sup>3</sup>		
7	No. 6					
	Area =	5.18 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	1367.67 m <sup>3</sup>				
	Total Volume =		1,367.67	m <sup>3</sup>		
8	No. 7					
	Area =	5.18 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	129.62 m <sup>3</sup>				
	Total Volume =		129.62	m <sup>3</sup>		

Name Structure :		: Dike Leprak 23				
Type of work		: Cyclop Concrete				
No.	Description	Calculation	Volume	Unit	Drawing reference	
9	No. 8					
	Area =	5.18 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	129.62 m <sup>3</sup>				
	Total Volume =		129.62	m <sup>3</sup>		
10	No. 9					
	Area =	5.18 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	129.62 m <sup>3</sup>				
	Total Volume =		129.62	m <sup>3</sup>		
11	No. 10					
	Area =	5.18 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	129.62 m <sup>3</sup>				
	Total Volume =		129.62	m <sup>3</sup>		
12	No. 11					
	Area =	5.18 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	129.62 m <sup>3</sup>				
	Total Volume =		129.62	m <sup>3</sup>		
13	No. 12					
	Area =	5.18 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	129.62 m <sup>3</sup>				
	Total Volume =		129.62	m <sup>3</sup>		
14	No. 13					
	Area =	5.18 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	129.62 m <sup>3</sup>				
	Total Volume =		129.62	m <sup>3</sup>		
15	No. 14					
	Area =	0.00 m <sup>2</sup>				
	Length =	25.00 m'				
	V=	64.81 m <sup>3</sup>				
	Total Volume =		64.81	m <sup>3</sup>		
			<b>Cyclop Concrete Total Volume =</b>	<b>11,154.98</b>	<b>m<sup>3</sup></b>	

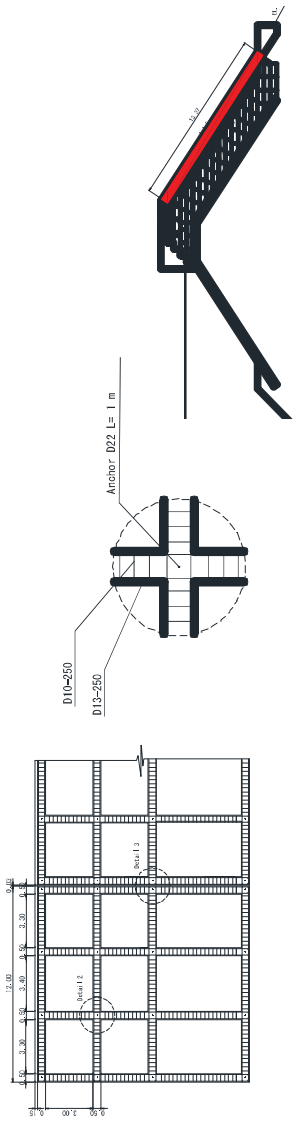
Name Structure :		: Dike Leprak 23					
Type of work		: Exposed Formwork					
No.	Description	Calculation	Volume	Unit	Drawing reference		
1	No. 0	Formwork Length = 0.00 m Length = 25.00 m' Volume = 0.00 m <sup>2</sup>					
		Total Volume =	-	m <sup>2</sup>			
2	No. 1	Formwork Length = 39.26 m Length = 25.00 m' Volume = 490.75 m <sup>2</sup>					
		Total Volume =	490.75	m <sup>2</sup>			
3	No. 2	Formwork Length = 40.30 m Length = 25.00 m' Volume = 994.50 m <sup>2</sup>					
		Total Volume =	994.50	m <sup>2</sup>			
4	No. 3	Formwork Length = 40.34 m Length = 25.00 m' Volume = 1008.00 m <sup>2</sup>					
		Total Volume =	1,008.00	m <sup>2</sup>			
5	No. 4	Formwork Length = 42.40 m Length = 25.00 m' Volume = 1034.25 m <sup>2</sup>					
		Total Volume =	1,034.25	m <sup>2</sup>			
6	No. 5	Formwork Length = 43.44 m Length = 25.00 m' Volume = 1073.00 m <sup>2</sup>					
		Total Volume =	1,073.00	m <sup>2</sup>			
7	No. 6	Formwork Length = 25.95 m Length = 25.00 m' Volume = 867.38 m <sup>2</sup>					
		Total Volume =	867.38	m <sup>2</sup>			
8	No. 7	Formwork Length = 26.48 m Length = 25.00 m' Volume = 874.00 m <sup>2</sup>					
		Total Volume =	874.00	m <sup>2</sup>			
9	No. 8	Formwork Length = 19.95 m Length = 25.00 m' Volume = 573.75 m <sup>2</sup>					
		Total Volume =	573.75	m <sup>2</sup>			

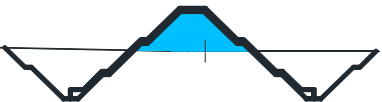
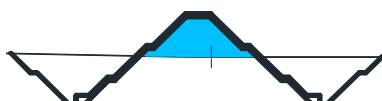
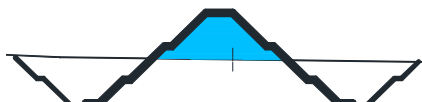
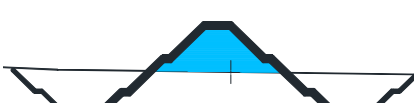
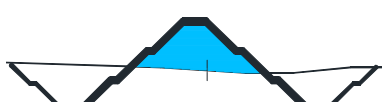
Name Structure :		: Dike Leprak 23				
Type of work		: Exposed Formwork				
No.	Description	Calculation	Volume	Unit	Drawing reference	
10	No. 9	Formwork Length = 20.41	m			
		Length = 25.00	m'			
		Volume = 504.50	m <sup>2</sup>			
		Total Volume =		504.50		
11	No. 10	Formwork Length = 20.81	m			
		Length = 25.00	m'			
		Volume = 515.25	m <sup>2</sup>			
		Total Volume =		515.25		
12	No. 11	Formwork Length = 21.20	m			
		Length = 25.00	m'			
		Volume = 525.13	m <sup>2</sup>			
		Total Volume =		525.13		
13	No. 12	Formwork Length = 21.60	m			
		Length = 25.00	m'			
		Volume = 535.00	m <sup>2</sup>			
		Total Volume =		535.00		
14	No. 13	Formwork Length = 21.99	m			
		Length = 25.00	m'			
		Volume = 544.88	m <sup>2</sup>			
		Total Volume =		544.88		
15	No. 14	Formwork Length = 0.00	m			
		Length = 25.00	m'			
		Volume = 274.88	m <sup>2</sup>			
		Total Volume =		274.88		
<b>Exposed Formwork Total Volume =</b>					<b>9,815.25</b>	<b>m<sup>2</sup></b>


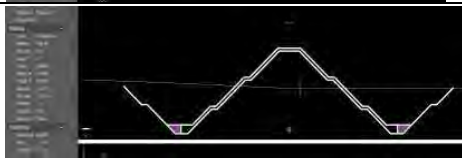

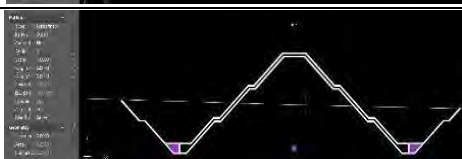


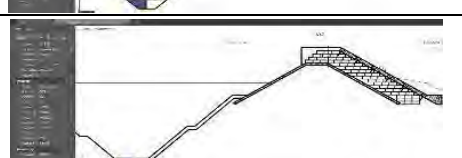
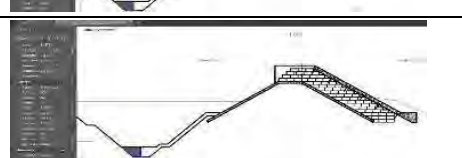
Name Structure :		: Dike Leprak 23					
Type of work		: Non Exposed Formwork					
No.	Description	Calculation	Volume	Unit	Drawing reference		
1	No. 0	Formwork Length =	0.00	m			
		Length =	25.00	m <sup>1</sup>			
		Volume =	0.00	m <sup>2</sup>			
		Total Volume =					m <sup>3</sup>
2	No. 1	Formwork Length =	17.58	m			
		Length =	25.00	m <sup>1</sup>			
		Volume =	219.75	m <sup>2</sup>			
		Total Volume =			219.75		m <sup>3</sup>
3	No. 2	Formwork Length =	17.49	m			
		Length =	25.00	m <sup>1</sup>			
		Volume =	438.38	m <sup>2</sup>			
		Total Volume =			438.38		m <sup>3</sup>
4	No. 3	Formwork Length =	18.97	m			
		Length =	25.00	m <sup>1</sup>			
		Volume =	455.75	m <sup>2</sup>			
		Total Volume =			455.75		m <sup>3</sup>
5	No. 4	Formwork Length =	20.99	m			
		Length =	25.00	m <sup>1</sup>			
		Volume =	499.50	m <sup>2</sup>			
		Total Volume =			499.50		m <sup>3</sup>
6	No. 5	Formwork Length =	22.43	m			
		Length =	25.00	m <sup>1</sup>			
		Volume =	542.75	m <sup>2</sup>			
		Total Volume =			542.75		m <sup>3</sup>
7	No. 6	Formwork Length =	0.00	m			
		Length =	25.00	m <sup>1</sup>			
		Volume =	280.38	m <sup>2</sup>			
		Total Volume =			280.38		m <sup>3</sup>
8	No. 7	Formwork Length =	0.00	m			
		Length =	25.00	m <sup>1</sup>			
		Volume =	280.38	m <sup>2</sup>			
		Total Volume =			280.38		m <sup>3</sup>
9	No. 8	Formwork Length =	0.00	m			
		Length =	25.00	m <sup>1</sup>			
		Volume =	0.00	m <sup>2</sup>			
		Total Volume =					m <sup>3</sup>

Name Structure :		: Dike Leprak 23					
Type of work		: Non Exposed Formwork					
No.	Description	Calculation	Volume	Unit	Drawing reference		
10	<b>No. 9</b>						
	Formwork Length =	0.00 m					
	Length =	25.00 m <sup>1</sup>					
	Volume =	0.00 m <sup>2</sup>					
	Total Volume =		-	m <sup>2</sup>			
11	<b>No. 10</b>						
	Formwork Length =	0.00 m					
	Length =	25.00 m <sup>1</sup>					
	Volume =	0.00 m <sup>2</sup>					
	Total Volume =		-	m <sup>2</sup>			
12	<b>No. 11</b>						
	Formwork Length =	0.00 m					
	Length =	25.00 m <sup>1</sup>					
	Volume =	0.00 m <sup>2</sup>					
	Total Volume =		-	m <sup>2</sup>			
13	<b>No. 12</b>						
	Formwork Length =	0.00 m					
	Length =	25.00 m <sup>1</sup>					
	Volume =	0.00 m <sup>2</sup>					
	Total Volume =		-	m <sup>2</sup>			
14	<b>No. 13</b>						
	Formwork Length =	0.00 m					
	Length =	25.00 m <sup>1</sup>					
	Volume =	0.00 m <sup>2</sup>					
	Total Volume =		-	m <sup>2</sup>			
15	<b>No. 14</b>						
	Formwork Length =	0.00 m					
	Length =	25.00 m <sup>1</sup>					
	Volume =	0.00 m <sup>2</sup>					
	Total Volume =		-	m <sup>2</sup>			
2	<b>Luasan Bekisting No. 1</b>						
	Area =	66.09 m <sup>2</sup>					
	Volume =	66.09 m <sup>2</sup>					
	Total Volume =		66.09	m <sup>2</sup>			
3	<b>Luasan Bekisting No. 2</b>				Asumsi Joint Per 25 m		
	Area =	66.27 m <sup>2</sup>					
	Volume =	66.27 m <sup>2</sup>					
	Total Volume =		66.27	m <sup>2</sup>			
4	<b>Luasan Bekisting No. 3</b>				Asumsi Joint Per 25 m		
	Area =	75.83 m <sup>2</sup>					
	Volume =	75.83 m <sup>2</sup>					
	Total Volume =		75.83	m <sup>2</sup>			
5	<b>Luasan Bekisting No. 4</b>				Asumsi Joint Per 25 m		
	Area =	92.31 m <sup>2</sup>					
	Volume =	92.31 m <sup>2</sup>					
	Total Volume =		92.31	m <sup>2</sup>			
6	<b>Luasan Bekisting No. 5</b>				Asumsi Joint Per 25 m		
	Area =	104.23 m <sup>2</sup>					
	Volume =	104.23 m <sup>2</sup>					
	Total Volume =		104.23	m <sup>2</sup>			
<b>Non Exposed Formwork Total Volume =</b>					<b>3,121.60 m<sup>2</sup></b>		

Name Structure : Dike Leptrak 23 Type of work : Reinforced Bar												
No.	Code	D (mm)	Numbers (pcs)	Length (m)		Design	Weight per m <sup>3</sup> (kg/m)		Total weight of 1 Rebar (kg)	Numbers of Rebar	Total Weight (kg)	Note
				Overlap	Buckling		Total	Total				
1	Main rebar											
	1 Beam	13	4	12.00	-		1.04	12.48	49.92	4	49.92	
	Main Rebar (4D13)											
	1 Coloumn	13	4	13.40	1.04		1.04	15.02	60.07	4	60.07	
	Main Rebar (4D13)											
	Dike Length (m)							325.00				
	Total Reinforcement Requirements											
	Beam		6					49.92	97344.00			
	Coloumn		108					60.07	86533.88			
2	Cross Bar											
	1 Beam	10	1300	1.60	0.1		0.62	1.05	1370.20	1300	1370.20	
	Cross Bar (ø10-250)											
	1 Coloumn	10	53	1.60	0.1		0.62	1.05	55.86	53	55.86	
	Cross Bar (ø10-250)											
	Dike Length (m)							325.00				
	Total Reinforcement Requirements											
	Beam		6					1370.20	8221.20			
	Coloumn		108					55.86	6033.10			
	Reinforced Bar Total Weight =								198,532.18 kg			
									198.53 ton			




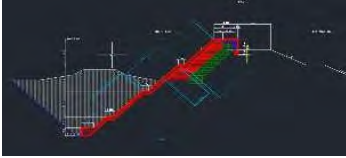
Name Structure :		: Dike Leprak 23			
Type of work		: Joint Filler			
No.	Description	Calculation	Volume	Unit	Drawing reference
1	No. 0	Joitn Filler Area = 0.00 m <sup>2</sup> Length = 25.00 m' Volume = 0.00 m <sup>2</sup>			
		Total Volume =		m <sup>2</sup>	
2	No. 1	Joitn Filler Area = 64.20 m <sup>2</sup> Length = 25.00 m' Volume = 64.20 m <sup>2</sup>			
		Total Volume =	64.20	m <sup>2</sup>	
3	No. 2	Joitn Filler Area = 64.50 m <sup>2</sup> Length = 25.00 m' Volume = 64.50 m <sup>2</sup>			
		Total Volume =	64.50	m <sup>2</sup>	
4	No. 3	Joitn Filler Area = 72.44 m <sup>2</sup> Length = 25.00 m' Volume = 72.44 m <sup>2</sup>			
		Total Volume =	72.44	m <sup>2</sup>	
5	No. 4	Joitn Filler Area = 86.82 m <sup>2</sup> Length = 25.00 m' Volume = 86.82 m <sup>2</sup>			
		Total Volume =	86.82	m <sup>2</sup>	
6	No. 5	Joitn Filler Area = 97.20 m <sup>2</sup> Length = 25.00 m' Volume = 97.20 m <sup>2</sup>			
		Total Volume =	97.20	m <sup>2</sup>	
		<b>Joint Filler Total Area = 385.15 m<sup>2</sup></b> <b>Joitn Filler Thickness = 0.02 m</b> <b>Joint Filler Total Volume = 7.70 m<sup>3</sup></b>			


Struktur		: Dike Leprak 23					
Jenis Pekerjaan		: Backfill					
No.	Uraian	Perhitungan	Jml	Volume	sat.	Gambar	
1	No. 0	Luas = 0.00 m <sup>2</sup> Panjang = 25.00 m' Volume = 0.00 m <sup>3</sup>					
		Total Volume =		-	m <sup>2</sup>		
2	No. 1	Luas = 5.25 m <sup>2</sup> Panjang = 25.00 m' Volume = 65.63 m <sup>3</sup>					
		Total Volume =		65.63	m <sup>3</sup>		
3	No. 2	Luas = 5.25 m <sup>2</sup> Panjang = 25.00 m' Volume = 131.25 m <sup>3</sup>					
		Total Volume =		131.25	m <sup>3</sup>		
4	No. 3	Luas = 5.25 m <sup>2</sup> Panjang = 25.00 m' Volume = 131.25 m <sup>3</sup>					
		Total Volume =		131.25	m <sup>3</sup>		
5	No. 4	Luas = 5.25 m <sup>2</sup> Panjang = 25.00 m' Volume = 131.25 m <sup>3</sup>					
		Total Volume =		131.25	m <sup>3</sup>		
6	No. 5	Luas = 5.25 m <sup>2</sup> Panjang = 25.00 m' Volume = 131.25 m <sup>3</sup>					
		Total Volume =		131.25	m <sup>3</sup>		
7	No. 6	Luas = 2.63 m <sup>2</sup> Panjang = 25.00 m' Volume = 98.44 m <sup>3</sup>					
		Total Volume =		98.44	m <sup>3</sup>		
8	No. 7	Luas = 2.63 m <sup>2</sup> Panjang = 25.00 m' Volume = 98.44 m <sup>3</sup>					
		Total Volume =		98.44	m <sup>3</sup>		
9	No. 8	Luas = 2.63 m <sup>2</sup> Panjang = 25.00 m' Volume = 65.63 m <sup>3</sup>					
		Total Volume =		65.63	m <sup>3</sup>		

Struktur		: Dike Leprak 23					
Jenis Pekerjaan		: Backfill					
No.	Uraian	Perhitungan	Jml	Volume	sat.	Gambar	
10	No. 9	Luas = 2.63 m <sup>2</sup>					
		Panjang = 25.00 m'					
		Volume = 65.63 m <sup>3</sup>					
		Total Volume =		65.63	m <sup>3</sup>		
11	No. 10	Luas = 2.63 m <sup>2</sup>					
		Panjang = 25.00 m'					
		Volume = 65.63 m <sup>3</sup>					
		Total Volume =		65.63	m <sup>3</sup>		
12	No. 11	Luas = 2.63 m <sup>2</sup>					
		Panjang = 25.00 m'					
		Volume = 65.63 m <sup>3</sup>					
		Total Volume =		65.63	m <sup>3</sup>		
13	No. 12	Luas = 2.63 m <sup>2</sup>					
		Panjang = 25.00 m'					
		Volume = 65.63 m <sup>3</sup>					
		Total Volume =		65.63	m <sup>3</sup>		
14	No. 13	Luas = 2.63 m <sup>2</sup>					
		Panjang = 25.00 m'					
		Volume = 65.63 m <sup>3</sup>					
		Total Volume =		65.63	m <sup>3</sup>		
15	No. 14	Luas = 0.00 m <sup>2</sup>					
		Panjang = 25.00 m'					
		Volume = 32.81 m <sup>3</sup>					
		Total Volume =		32.81	m <sup>3</sup>		
				<b>Backfill Total Volume =</b>	<b>1,214.06</b>	<b>m<sup>3</sup></b>	

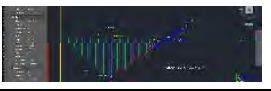

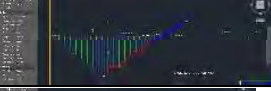













SUMMARY QUANTITY DIKE KEBONDELI XVII 2021			
No.	Description	Unit	Volume
1	Stake Out	m2	25,139.00
2	Cross Profile	m	366.52
3	Bowplank	m	764.36
4	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	12,779.21
5	Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Split Stone, with Concrete Pump (CP)	m3	7,771.39
6	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	18,009.50
7	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	21,394.25
8	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	18,009.50
9	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	3,384.75
10	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	3,384.75
11	Mechanical Sand Excavation	m3	111,759.54
12	Geotextile	m2	14,846.25






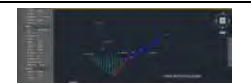

Name Structure :		: Dike Kebondeli XVII			
Type of work :		: Stake Out			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	Area =	25139.00	25,139.00	m <sup>2</sup>	
	Carefully dismantle 1 m2 of Formwork and Scaffolding				
	<b>Total Area Stake Out</b>		<b>25,139.00</b>	<b>m<sup>2</sup></b>	




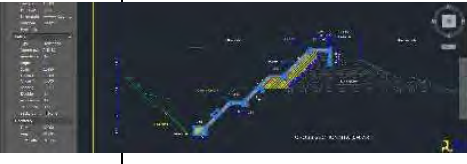
Name Structure :		: Dike Kebondeli XVII			
Type of work :		: Cross Profile			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	Dike span =	26.18			
	Measure each section	14.00	366.52	m	
	Carefully dismantle 1 m2 of Formwork and Scaffolding				
	<b>Total</b>		<b>366.52</b>	<b>m</b>	




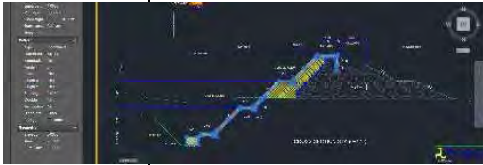
Name Structure : : Dike Kebondeli XVII					
Type of work : : Bowplank					
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	Profile Length =	706.00	764.36	m	
	Cross Section Length =	58.36			
		Carefully dismantle 1 m2 of Formwork and Scaffolding			
	<b>Bowplank Total Volume =</b>		<b>764.36</b>	<b>m'</b>	




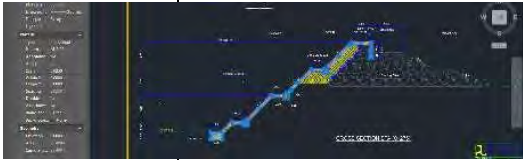
Name Structure :		: Dike Kebondeli XVII			
Type of work :		: Sand Excavation			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	15	Area = 68.75 Length = 25.000 V= (68,75) / 2 x 25,00	859.40	m <sup>3</sup>	
2	16	Carefully dismantle 1 m2 of For Length = 91.72 V= (68,75 + 91,72) / 2 x 25,00	2,005.92	m <sup>3</sup>	
3	17	Area = 98.31 Length = 25.00 V= (98,31 + 98,31) / 2 x 25,00	2,457.77	m <sup>3</sup>	
4	18	Area = 78.34 Length = 25.00 V= (98,31 + 78,34) / 2 x 25,00	2,208.08	m <sup>3</sup>	
5	19	Area = 73.95 Length = 25.00 V= (78,34 + 73,95) / 2 x 25,00	1,903.51	m <sup>3</sup>	
6	20	Area = 97.93 Length = 25.00 V= (73,95 + 97,93) / 2 x 25,00	2,148.44	m <sup>3</sup>	
7	21	Area = 131.89 Length = 25.00 V= (97,93 + 131,89) / 2 x 25,00	2,872.73	m <sup>3</sup>	
8	22	Area = 121.34 Length = 25.00 V= (131,89 + 121,34) / 2 x 25,00	3,165.36	m <sup>3</sup>	
9	23	Area = 123.69 Length = 25.00 V= (121,34 + 123,69) / 2 x 25,00	3,062.94	m <sup>3</sup>	
10	24	Area = 130.37 Length = 25.00 V= (123,69 + 130,37) / 2 x 25,00	3,175.81	m <sup>3</sup>	
11	25	Area = 162.33 Length = 25.00 V= (130,37 + 162,33) / 2 x 25,00	3,658.75	m <sup>3</sup>	
12	26	Area = 141.01 Length = 25.00 V= (162,33 + 141,01) / 2 x 25,00	3,791.79	m <sup>3</sup>	
13	27	Area = 195.59 Length = 25.00 V= (141,01 + 195,59) / 2 x 25,00	4,207.61	m <sup>3</sup>	
14	28	Area = 226.42 Length = 25.00 V= (195,59 + 226,42) / 2 x 25,00	5,275.23	m <sup>3</sup>	
15	29	Area = 269.04 Length = 25.00 V= (226,42 + 269,04) / 2 x 25,00	6,193.35	m <sup>3</sup>	


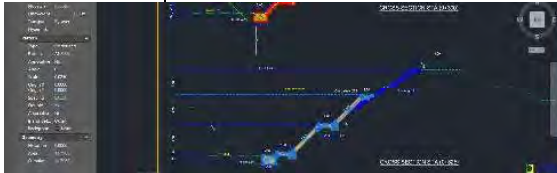

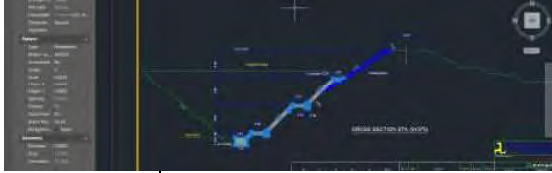
Name Structure :		: Dike Kebondeli XVII			
Type of work :		: Sand Excavation			
No.	Description	Calculation	Volume	Unit	Drawing Reference
16	30 Area = Length = V=	282.68 25.00 $(269,04 + 282,68) / 2 \times 25,00$	6.896.51	m <sup>3</sup>	
17	31 Area = Length = V=	282.78 25.00 $(282,68 + 282,78) / 2 \times 25,00$	7.068.21	m <sup>3</sup>	
18	32 Area = Length = V=	276.89 25.00 $(282,78 + 276,89) / 2 \times 25,00$	6.995.92	m <sup>3</sup>	
19	33 Area = Length = V=	291.48 25.00 $(276,89 + 291,48) / 2 \times 25,00$	7.104.61	m <sup>3</sup>	
20	34 Area = Length = V=	364.07 25.00 $(291,48 + 364,07) / 2 \times 25,00$	8.194.26	m <sup>3</sup>	
21	35 Area = Length = V=	64.81 25.00 $(364,07 + 64,81) / 2 \times 25,00$	5.360.91	m <sup>3</sup>	
22	36 Area = Length = V=	34.90 25.00 $(64,81 + 34,90) / 2 \times 25,00$	1.246.39	m <sup>3</sup>	
23	37 Area = Length = V=	50.31 50.000 $(34,90 + 50,31) / 2 \times 50,00$	2.130.46	m <sup>3</sup>	
24	38 Area = Length = V=	54.20 25.00 $(54,20 + 54,20) / 2 \times 25,00$	1.354.95	m <sup>3</sup>	
25	39 Area = Length = V=	58.26 25.00 $(54,20 + 58,26) / 2 \times 25,00$	1.405.66	m <sup>3</sup>	
26	40 Area = Length = V=	62.35 25.00 $(58,26 + 62,35) / 2 \times 25,00$	1.507.53	m <sup>3</sup>	
27	41 Area = Length = V=	53.87 25.00 $(62,35 + 53,87) / 2 \times 25,00$	1.452.75	m <sup>3</sup>	
28	42 Area = Length = V=	54.35 25.00 $(53,87 + 54,35) / 2 \times 25,00$	1.352.84	m <sup>3</sup>	
29	43 Area = Length = V=	59.54 25.00 $(54,35 + 59,54) / 2 \times 25,00$	1.423.72	m <sup>3</sup>	
30	44 Area = Length = V=	63.53 25.00 $(59,54 + 63,53) / 2 \times 25,00$	1.538.36	m <sup>3</sup>	
31	45 Area = Length = V=	66.37 25.00 $(63,53 + 66,37) / 2 \times 25,00$	1.623.66	m <sup>3</sup>	





Name Structure :		: Dike Kebondeli XVII			
Type of work		: Sand Excavation			
No.	Description	Calculation	Volume	Unit	Drawing Reference
32	46	Area = 52.50 Length = 25.00 V= (66,37 + 52,50) / 2 x 25,00	1,485.85	m³	
33	47	Area = 43.28 Length = 25.00 V= (52,50 + 43,28) / 2 x 25,00	1,197.26	m³	
34	48	Area = 48.15 Length = 25.00 V= (43,28 + 48,15) / 2 x 25,00	1,142.91	m³	
35	49	Area = 37.77 Length = 25.00 V= (48,15 + 37,77) / 2 x 25,00	1,074.08	m³	
36	50	Area = 41.26 Length = 25.00 V= (37,77 + 41,26) / 2 x 25,00	987.88	m³	
37	51	Area = 43.87 Length = 25.00 V= (41,26 + 43,87) / 2 x 25,00	1,064.11	m³	
38	52	Area = 49.25 Length = 25.00 V= (43,87 + 49,25) / 2 x 25,00	1,164.07	m³	
Sand Excavation Total Volume =			111,759.54	m³	





Name Structure :		: Dike Kebondeli XVII			
Type of work		: Concrete K-225			
No.	Description	Calculation	Volume	Unit	Drawing Reference
15	Area =	19.66	m <sup>2</sup>		
	Length =	25.00	m <sup>1</sup>		
	Volume =	491.39	m <sup>3</sup>		
	Total Volume =			491.39	
± 1 m2 of Formwork and Scaffolding					
					
16	Area =	19.85	m <sup>2</sup>		
	Length =	25.00	m <sup>1</sup>		
	Volume =	496.25	m <sup>3</sup>		
	Total Volume =			496.25	
					
17	Area =	20.04	m <sup>2</sup>		
	Length =	25.00	m <sup>1</sup>		
	Volume =	501.11	m <sup>3</sup>		
	Total Volume =			501.11	
					
18	Area =	20.24	m <sup>2</sup>		
	Length =	25.00	m <sup>1</sup>		
	Volume =	505.97	m <sup>3</sup>		
	Total Volume =			505.97	
					





Name Structure :		: Dike Kebondeli XVII			
Type of work :		: Concrete K-225			
No.	Description	Calculation	Volume	Unit	Drawing Reference
19	Area =	20.43 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	<b>510.83</b> m <sup>3</sup>			
			510.83	m <sup>3</sup>	
					
20	Area =	22.24 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	<b>556.07</b> m <sup>3</sup>			
	Total Volume =		556.07	m <sup>3</sup>	
					
21	Area =	22.44 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	<b>560.93</b> m <sup>3</sup>			
	Total Volume =		560.93	m <sup>3</sup>	
					
22	Area =	22.54 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	<b>563.54</b> m <sup>3</sup>			
	Total Volume =		563.54	m <sup>3</sup>	
					





Name Structure :		: Dike Kebondeli XVII			
Type of work :		: Concrete K-225			
No.	Description	Calculation	Volume	Unit	Drawing Reference
23	Area =	22.83 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	570.65 m <sup>3</sup>			
	Total Volume =		570.65	m <sup>3</sup>	
					
24	Area =	23.02 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	575.51 m <sup>3</sup>			
	Total Volume =		575.51	m <sup>3</sup>	
					
25	Area =	23.21 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	580.37 m <sup>3</sup>			
	Total Volume =		580.37	m <sup>3</sup>	
					
26	Area =	23.41 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	585.24 m <sup>3</sup>			
	Total Volume =		585.24	m <sup>3</sup>	
					
<b>Concrete K-225 Sub Total Volume =</b>				<b>6,497.84</b>	<b>m<sup>3</sup></b>





Name Structure :		: Dike Kebondeli XVII			
Type of work		: Concrete K-225			
No.	Description	Calculation	Volume	Unit	Drawing Reference
27					
	Area =	23.60 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	590.10 m <sup>3</sup>			
	Total Volume =		590.10	m <sup>3</sup>	
					
28					
	Area =	14.80 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	369.90 m <sup>3</sup>			
	Total Volume =		369.90	m <sup>3</sup>	
					
29					
	Area =	14.99 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	374.76 m <sup>3</sup>			
	Total Volume =		374.76	m <sup>3</sup>	
					
30					
	Area =	15.19 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	379.63 m <sup>3</sup>			
	Total Volume =		379.63	m <sup>3</sup>	
					



Name Structure :		: Dike Kebondeli XVII			
Type of work		: Concrete K-225			
No.	Description	Calculation	Volume	Unit	Drawing Reference
31	Area =	15.38 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	384.49 m <sup>3</sup>			
			384.49	m <sup>3</sup>	
					
32	Area =	15.57 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	389.35 m <sup>3</sup>			
	Total Volume =		389.35	m <sup>3</sup>	
					
33	Area =	15.77 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	394.21 m <sup>3</sup>			
	Total Volume =		394.21	m <sup>3</sup>	
					
34	Area =	15.96 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	399.07 m <sup>3</sup>			
	Total Volume =		399.07	m <sup>3</sup>	
					

Name Structure :		: Dike Kebondeli XVII			
Type of work		: Concrete K-225			
No.	Description	Calculation	Volume	Unit	Drawing Reference
35	Area =	5.57 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	139.33 m <sup>3</sup>			
	Total Volume =		139.33	m <sup>3</sup>	
					
36	Area =	5.70 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	142.43 m <sup>3</sup>			
	Total Volume =		142.43	m <sup>3</sup>	
					
37	Area =	5.82 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	145.52 m <sup>3</sup>			
	Total Volume =		145.52	m <sup>3</sup>	
					
38	Area =	5.94 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	148.61 m <sup>3</sup>			
	Total Volume =		148.61	m <sup>3</sup>	
					
Concrete K-225 Sub Total Volume =			3,857.39	m <sup>3</sup>	

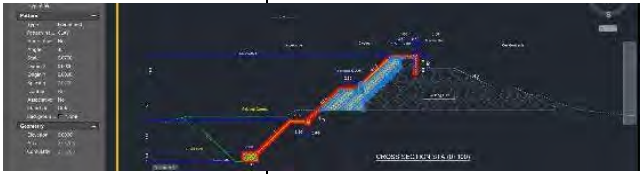
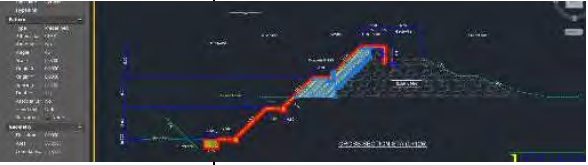

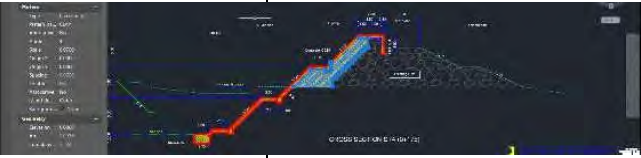
Name Structure : : Dike Kebondeli XVII					
Type of work : Concrete K-225					
No.	Description	Calculation	Volume	Unit	Wing Reference
39					
	Area =	6.07 m <sup>2</sup>			
	Length =	25.00 m'			
	Volume =	151.71 m <sup>3</sup>			
	Total Volume =		151.71	m <sup>3</sup>	
					
40					
	Area =	6.19 m <sup>2</sup>			
	Length =	25.00 m'			
	Volume =	154.80 m <sup>3</sup>			
	Total Volume =		154.80	m <sup>3</sup>	
					
41					
	Area =	6.32 m <sup>2</sup>			
	Length =	25.00 m'			
	Volume =	157.90 m <sup>3</sup>			
	Total Volume =		157.90	m <sup>3</sup>	
					
42					
	Area =	6.44 m <sup>2</sup>			
	Length =	25.00 m'			
	Volume =	160.99 m <sup>3</sup>			
	Total Volume =		160.99	m <sup>3</sup>	
					

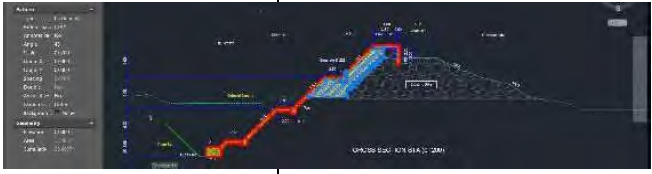

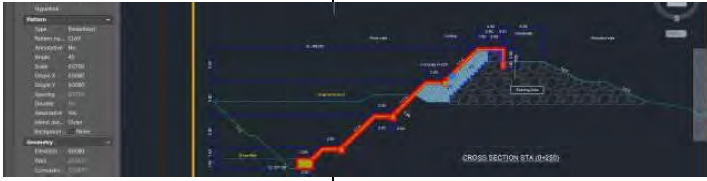

Name Structure : : Dike Kebondeli XVII					
Type of work : Concrete K-225					
No.	Description	Calculation	Volume	Unit	Wing Reference
43	Area =	6.56 m <sup>2</sup>			
	Length =	25.00 m'			
	Volume =	164.08 m <sup>3</sup>			
			164.08	m <sup>3</sup>	
					
44	Area =	6.69 m <sup>2</sup>			
	Length =	25.00 m'			
	Volume =	167.18 m <sup>3</sup>			
	Total Volume =		167.18	m <sup>3</sup>	
					
45	Area =	6.81 m <sup>2</sup>			
	Length =	25.00 m'			
	Volume =	170.27 m <sup>3</sup>			
	Total Volume =		170.27	m <sup>3</sup>	
					
46	Area =	6.93 m <sup>2</sup>			
	Length =	25.00 m'			
	Volume =	173.36 m <sup>3</sup>			
	Total Volume =		173.36	m <sup>3</sup>	
					


Name Structure :		: Dike Kebondeli XVII				
Type of work		: Concrete K-225				
No.	Description	Calculation	Volume	Unit	wing Reference	
47	Area =	7.18 m <sup>2</sup>				
	Length =	25.00 m <sup>1</sup>				
	Volume =	179.55 m <sup>3</sup>				
	Total Volume =		179.55	m <sup>3</sup>		
						
48	Area =	7.31 m <sup>2</sup>				
	Length =	25.00 m <sup>1</sup>				
	Volume =	182.64 m <sup>3</sup>				
	Total Volume =		182.64	m <sup>3</sup>		
						
49	Area =	7.43 m <sup>2</sup>				
	Length =	25.00 m <sup>1</sup>				
	Volume =	185.74 m <sup>3</sup>				
	Total Volume =		185.74	m <sup>3</sup>		
						
50	Area =	7.55 m <sup>2</sup>				
	Length =	25.00 m <sup>1</sup>				
	Volume =	188.83 m <sup>3</sup>				
	Total Volume =		188.83	m <sup>3</sup>		
						
Concrete K-225 Sub Total Volume =			2,037.04 m <sup>3</sup>			

Name Structure :		: Dike Kebondeli XVII			
Type of work :		: Concrete K-225			
No.	Description	Calculation	Volume	Unit	Drawing Reference
51	Area =	7.68 m <sup>2</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	191.93 m <sup>3</sup>			
			191.93	m <sup>3</sup>	
					
52	Area =	7.80 m <sup>2</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	195.02 m <sup>3</sup>			
	Total Volume =		195.02	m <sup>3</sup>	
					
<b>Concrete K-225 Total Volume =</b>			<b>12,779.21</b>	<b>m<sup>3</sup></b>	

Name Structure :		: Dike Kebondeli XVII			
Type of work :		: Concrete Cyclop			
No.	Description	Calculation	Volume	Unit	Drawing Reference
15	Area =	20.27	m <sup>2</sup>		
	Length =	25.00	m		
	Volume =	506.65	m <sup>3</sup>		
	le 1 m <sup>2</sup> of Formwork and Scaffolding		506.65	m <sup>3</sup>	
16	Area =	22.76	m <sup>2</sup>		
	Length =	25.00	m		
	Volume =	569.10	m <sup>3</sup>		
	Total Volume =		569.10	m <sup>3</sup>	
17	Area =	21.26	m <sup>2</sup>		
	Length =	25.00	m		
	Volume =	531.51	m <sup>3</sup>		
	Total Volume =		531.51	m <sup>3</sup>	
18	Area =	21.95	m <sup>2</sup>		
	Length =	25.00	m		
	Volume =	548.78	m <sup>3</sup>		
	Total Volume =		548.78	m <sup>3</sup>	

Name Structure :		: Dike Kebondeli XVII			
Type of work :		: Concrete Cyclop			
No.	Description	Calculation	Volume	Unit	Drawing Reference
19					
	Area =	27.32 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	683.02 m <sup>3</sup>			
			683.02	m <sup>3</sup>	
					
20					
	Area =	26.85 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	671.35 m <sup>3</sup>			
	Total Volume =		671.35	m <sup>3</sup>	
					
21					
	Area =	26.39 m <sup>2</sup>			
	Length =	22.18 m			
	Volume =	585.27 m <sup>3</sup>			
	Total Volume =		585.27	m <sup>3</sup>	
					
22					
	Area =	25.94 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	648.40 m <sup>3</sup>			
	Total Volume =		648.40	m <sup>3</sup>	
					

Name Structure :		: Dike Kebondeli XVII			
Type of work :		: Concrete Cyclop			
No.	Description	Calculation	Volume	Unit	Drawing Reference
23					
	Area =	25.49 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	637.14 m <sup>3</sup>			
	Total Volume =		637.14	m <sup>3</sup>	
					
24					
	Area =	25.04 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	626.02 m <sup>3</sup>			
	Total Volume =		626.02	m <sup>3</sup>	
					
25					
	Area =	22.66 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	566.44 m <sup>3</sup>			
	Total Volume =		566.44	m <sup>3</sup>	
					
26					
	Area =	24.17 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	604.21 m <sup>3</sup>			
	Total Volume =		604.21	m <sup>3</sup>	
					
<b>Cyclop Concrete Sub Total Volume =</b>			<b>7,177.89</b>	<b>m<sup>3</sup></b>	

Name Structure :		: Dike Kebondeli XVII			
Type of work :		: Concrete Cyclop			
No.	Description	Calculation	Volume	Unit	Drawing Reference
27					
	Area =	23.74 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	593.51 m <sup>3</sup>			
	Total Volume =		593.51	m <sup>3</sup>	
					
28					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	0.00 m <sup>3</sup>			
	Total Volume =		-	m <sup>3</sup>	
29					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	0.00 m <sup>3</sup>			
	Total Volume =		-	m <sup>3</sup>	
30					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	0.00 m <sup>3</sup>			
	Total Volume =		-	m <sup>3</sup>	

Name Structure :		: Dike Kebondeli XVII			
Type of work		: Concrete Cyclop			
No.	Description	Calculation	Volume	Unit	Drawing Reference
31					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	0.00 m <sup>3</sup>			
			-	m <sup>3</sup>	
32					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	0.00 m <sup>3</sup>			
	Total Volume =		-	m <sup>3</sup>	
33					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	0.00 m <sup>3</sup>			
	Total Volume =		-	m <sup>3</sup>	
34					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	0.00 m <sup>3</sup>			
	Total Volume =		-	m <sup>3</sup>	

Name Structure :		: Dike Kebondeli XVII				
Type of work :		: Concrete Cyclop				
No.	Description	Calculation	Volume	Unit	Drawing Reference	
35						
	Area =	0.00 m <sup>2</sup>				
	Length =	25.00 m				
	Volume =	m <sup>3</sup>				
	Total Volume =		-	m <sup>3</sup>		
36						
	Area =	0.00 m <sup>2</sup>				
	Length =	25.00 m				
	Volume =	0.00 m <sup>3</sup>				
	Total Volume =		-	m <sup>3</sup>		
37						
	Area =	0.00 m <sup>2</sup>				
	Length =	25.00 m				
	Volume =	0.00 m <sup>3</sup>				
	Total Volume =		-	m <sup>3</sup>		
38						
	Area =	0.00 m <sup>2</sup>				
	Length =	25.00 m				
	Volume =	0.00 m <sup>3</sup>				
	Total Volume =		-	m <sup>3</sup>		
<b>Cyclop Concrete Sub Total Volume =</b>			<b>593.51</b>	<b>m<sup>3</sup></b>		

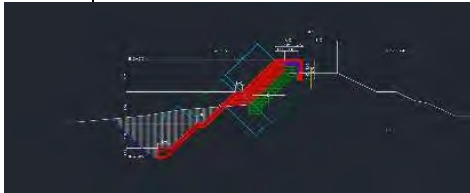


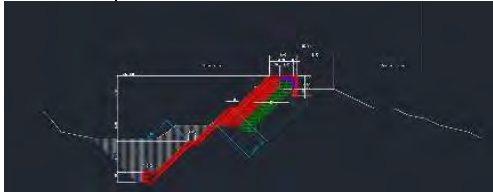
Name Structure : : Dike Kebondeli XVII					
Type of work : Concrete Cyclop					
No.	Description	Calculation	Volume	Unit	Drawing Reference
39					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	0.00 m <sup>3</sup>			
	Total Volume =		-	m <sup>3</sup>	
40					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	0.00 m <sup>3</sup>			
	Total Volume =		-	m <sup>3</sup>	
41					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	0.00 m <sup>3</sup>			
	Total Volume =		-	m <sup>3</sup>	
42					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	0.00 m <sup>3</sup>			
	Total Volume =		-	m <sup>3</sup>	

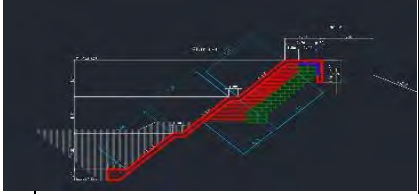
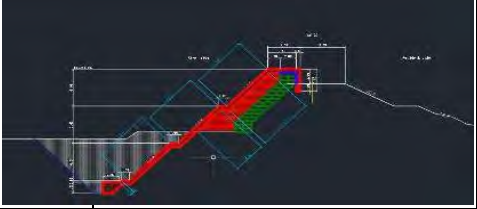
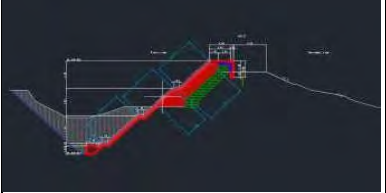
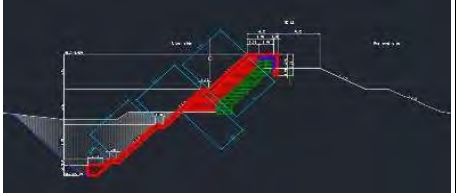
Name Structure : : Dike Kebondeli XVII					
Type of work : Concrete Cyclop					
No.	Description	Calculation	Volume	Unit	Drawing Reference
43					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	0.00 m <sup>3</sup>			
			-	m <sup>3</sup>	
44					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	0.00 m <sup>3</sup>			
	Total Volume =		-	m <sup>3</sup>	
45					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	0.00 m <sup>3</sup>			
	Total Volume =		-	m <sup>3</sup>	
46					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	0.00 m <sup>3</sup>			
	Total Volume =		-	m <sup>3</sup>	

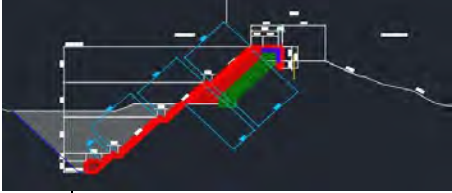
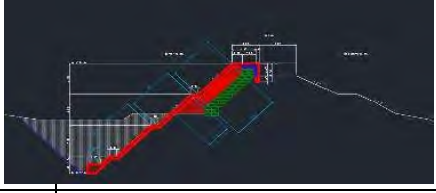
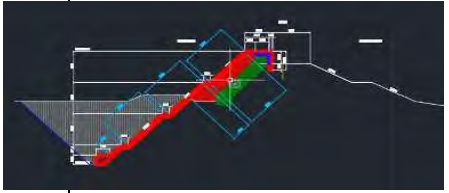
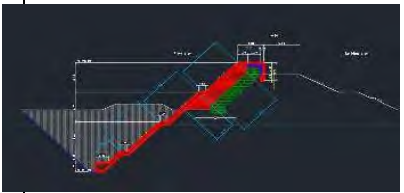
Name Structure :		: Dike Kebondeli XVII			
Type of work :		: Concrete Cyclop			
No.	Description	Calculation	Volume	Unit	Drawing Reference
47					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	0.00 m <sup>3</sup>			
	Total Volume =		-	m <sup>3</sup>	
48					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	0.00 m <sup>3</sup>			
	Total Volume =		-	m <sup>3</sup>	
49					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	0.00 m <sup>3</sup>			
	Total Volume =		-	m <sup>3</sup>	
50					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	0.00 m <sup>3</sup>			
	Total Volume =		-	m <sup>3</sup>	
<b>Cyclop Concrete Sub Total Volume =</b>			<b>-</b>	<b>m3</b>	

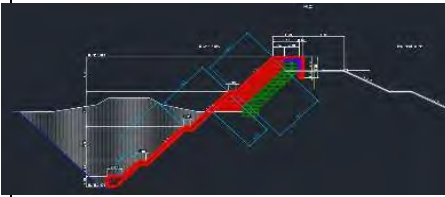
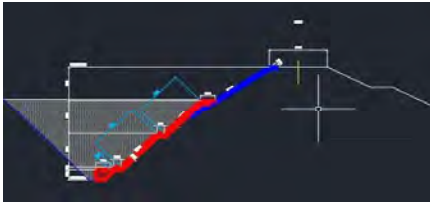
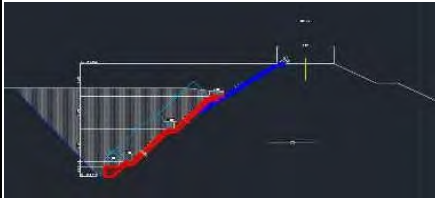
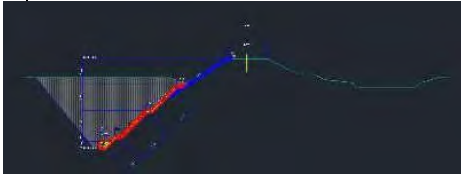
Name Structure : : Dike Kebondeli XVII  
 Type of work : Concrete Cyclop

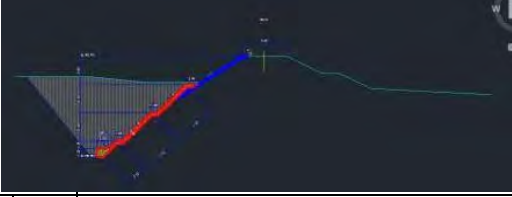
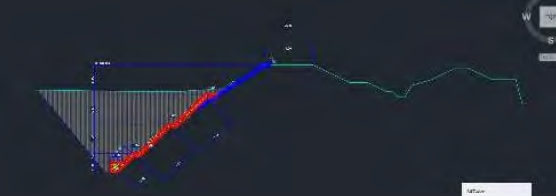
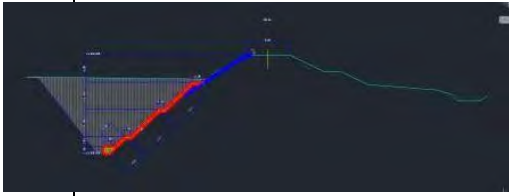
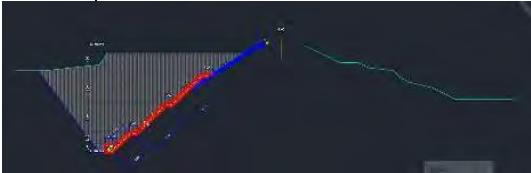
No.	Description	Calculation	Volume	Unit	Drawing Reference
51					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m'			
	Volume =	0.00 m <sup>3</sup>			
			-	m <sup>3</sup>	
52					
	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m'			
	Volume =	0.00 m <sup>3</sup>			
	Total Volume =		-	m <sup>3</sup>	
<b>Cyclop Concrete Sub Total Volume = 7,771.39 m<sup>3</sup></b>					

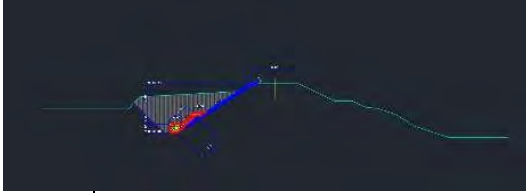
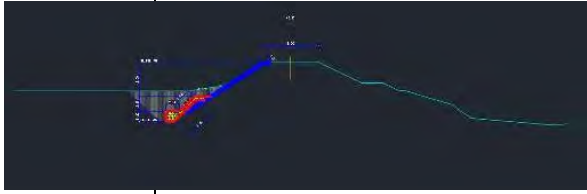
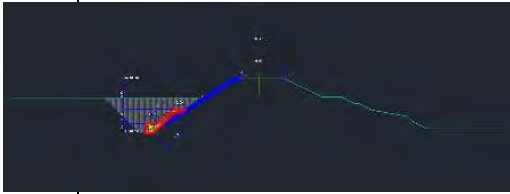

Name Structure :		: Dike Kebondeli XVII			
Type of work :		: Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
15	Formwork Length =	21.10 m'			
	Length =	25.00 m'			
	Volume =	527.50 m2			
	Total Volume =		527.50	m2	
					
16	Formwork Length =	21.51 m'			
	Length =	25.00 m'			
	Volume =	537.75 m2			
	Total Volume =		537.75	m2	
					
17	Formwork Length =	21.90 m'			
	Length =	25.00 m'			
	Volume =	547.50 m2			
	Total Volume =		547.50	m2	
					
18	Formwork Length =	22.29 m'			
	Length =	25.00 m'			
	Volume =	557.25 m2			
	Total Volume =		557.25	m2	
					

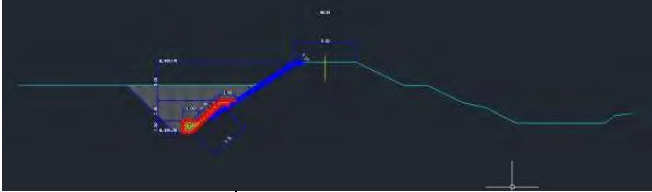

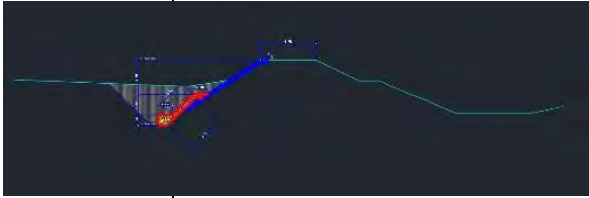
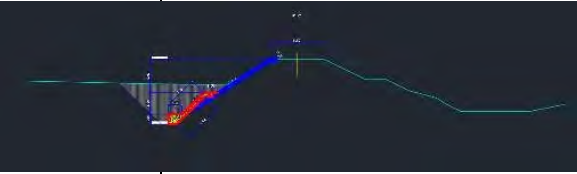
Name Structure :		: Dike Kebondeli XVII			
Type of work :		: Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
19					
	Formwork Length =	22.68 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	567.00 m <sup>2</sup>			
			567.00	m <sup>2</sup>	
					
20					
	Formwork Length =	23.06 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	576.50 m <sup>2</sup>			
	Total Volume =		576.50	m <sup>2</sup>	
					
21					
	Formwork Length =	23.45 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	586.25 m <sup>2</sup>			
	Total Volume =		586.25	m <sup>2</sup>	
					
22					
	Formwork Length =	23.84 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	596.00 m <sup>2</sup>			
	Total Volume =		596.00	m <sup>2</sup>	
					

Name Structure :		: Dike Kebondeli XVII			
Type of work :		: Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
23					
	Formwork Length =	24.23 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	605.75 m <sup>2</sup>			
	Total Volume =		605.75	m <sup>2</sup>	
					
24					
	Formwork Length =	24.62 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	615.50 m <sup>2</sup>			
	Total Volume =		615.50	m <sup>2</sup>	
					
25					
	Formwork Length =	25.01 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	625.25 m <sup>2</sup>			
	Total Volume =		625.25	m <sup>2</sup>	
					
26					
	Formwork Length =	25.40 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	635.00 m <sup>2</sup>			
	Total Volume =		635.00	m <sup>2</sup>	
					
<b>Exposed Formwork Sub Total Volume =</b>			<b>6,977.25</b>	<b>m<sup>2</sup></b>	

Name Structure :		: Dike Kebondeli XVII			
Type of work		: Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
27					
	Formwork Length =	25.79 m'			
	Length =	25.00 m'			
	Volume =	644.75 m2			
	Total Volume =		644.75	m2	
28					
	Formwork Length =	23.35 m'			
	Length =	25.00 m'			
	Volume =	583.75 m2			
	Total Volume =		583.75	m2	
29					
	Formwork Length =	23.74 m'			
	Length =	25.00 m'			
	Volume =	593.50 m2			
	Total Volume =		593.50	m2	
30					
	Formwork Length =	24.12 m'			
	Length =	25.00 m'			
	Volume =	603.00 m2			
	Total Volume =		603.00	m2	

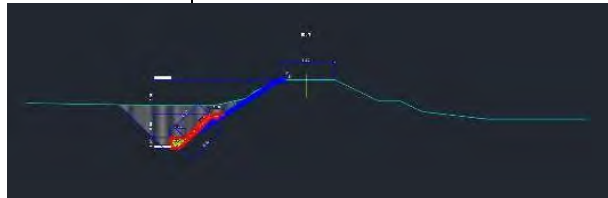
Name Structure :		: Dike Kebondeli XVII			
Type of work		: Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
31					
	Formwork Length =	24.51 m			
	Length =	25.00 m			
	Volume =	612.75 m <sup>2</sup>			
			612.75	m <sup>2</sup>	
					
32					
	Formwork Length =	24.90 m			
	Length =	25.00 m			
	Volume =	622.50 m <sup>2</sup>			
	Total Volume =		622.50	m <sup>2</sup>	
					
33					
	Formwork Length =	25.30 m			
	Length =	25.00 m			
	Volume =	632.50 m <sup>2</sup>			
	Total Volume =		632.50	m <sup>2</sup>	
					
34					
	Formwork Length =	25.68 m			
	Length =	25.00 m			
	Volume =	642.00 m <sup>2</sup>			
	Total Volume =		642.00	m <sup>2</sup>	
					

Name Structure :		: Dike Kebondeli XVII			
Type of work		: Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
35					
	Formwork Length =	11.36 m'			
	Length =	25.00 m'			
	Volume =	284.00 m <sup>2</sup>			
	Total Volume =		284.00	m <sup>2</sup>	
					
36					
	Formwork Length =	11.61 m'			
	Length =	25.00 m'			
	Volume =	290.25 m <sup>2</sup>			
	Total Volume =		290.25	m <sup>2</sup>	
					
37					
	Formwork Length =	11.86 m'			
	Length =	25.00 m'			
	Volume =	296.50 m <sup>2</sup>			
	Total Volume =		296.50	m <sup>2</sup>	
					
38					
	Formwork Length =	12.11 m'			
	Length =	25.00 m'			
	Volume =	302.75 m <sup>2</sup>			
	Total Volume =		302.75	m <sup>2</sup>	
					
<b>Exposed Formwork Sub Total Volume =</b>			<b>6,108.25</b>	<b>m<sup>2</sup></b>	

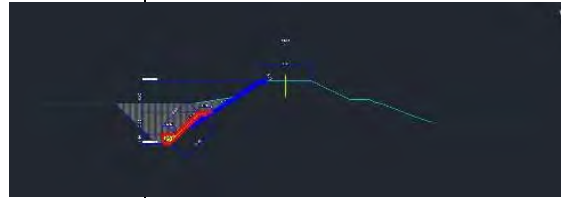
Name Structure :		: Dike Kebondeli XVII			
Type of work		: Exposed Formwork			
No.	Description	Calculation	Volume	Unit	wing Reference
39					
	Formwork Length =	12.35 m'			
	Length =	25.00 m'			
	Volume =	308.75 m2			
	Total Volume =		308.75	m2	
					
40					
	Formwork Length =	12.60 m'			
	Length =	25.00 m'			
	Volume =	315.00 m2			
	Total Volume =		315.00	m2	
					
41					
	Formwork Length =	12.85 m'			
	Length =	25.00 m'			
	Volume =	321.25 m2			
	Total Volume =		321.25	m2	
					
42					
	Formwork Length =	12.10 m'			
	Length =	25.00 m'			
	Volume =	302.50 m2			
	Total Volume =		302.50	m2	
					

Name Structure : : Dike Kebondeli XVII  
 Type of work : Exposed Formwork

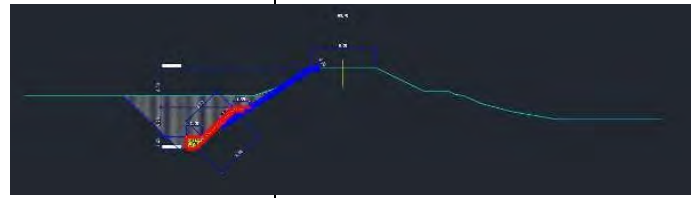
No.	Description	Calculation	Volume	Unit	wing Reference
43					
	Formwork Length =	13.34 m'			
	Length =	25.00 m'			
	Volume =	333.50 m2			
			333.50	m2	



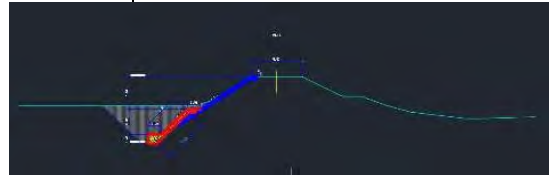
44					
	Formwork Length =	13.59 m'			
	Length =	25.00 m'			
	Volume =	339.75 m2			
	Total Volume =		339.75	m2	

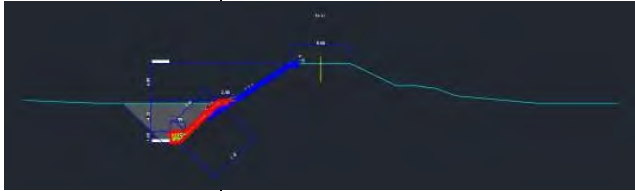
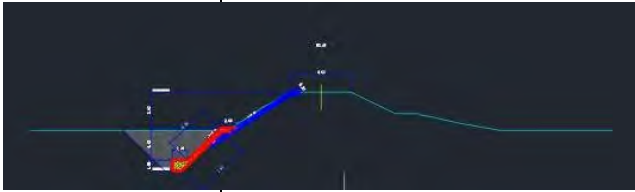
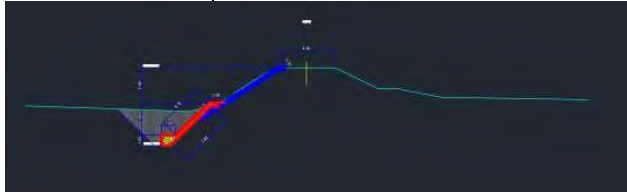
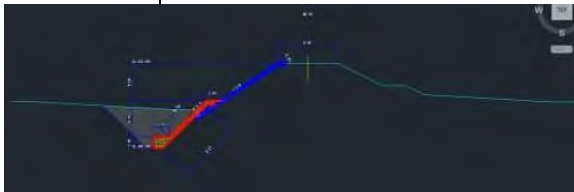


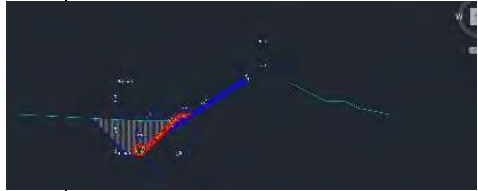
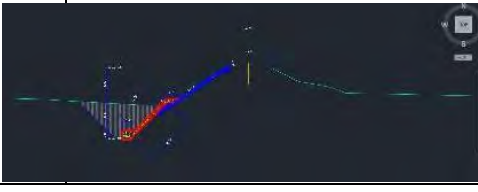
45					
	Formwork Length =	13.84 m'			
	Length =	25.00 m'			
	Volume =	346.00 m2			
	Total Volume =		346.00	m2	

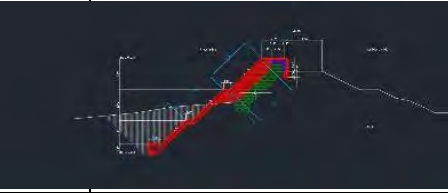






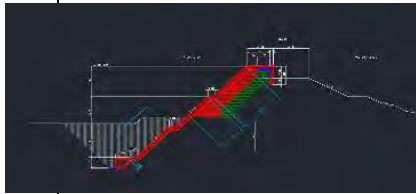
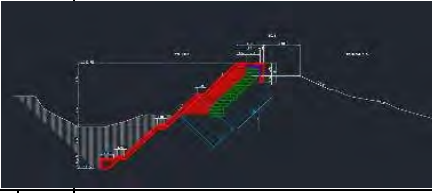
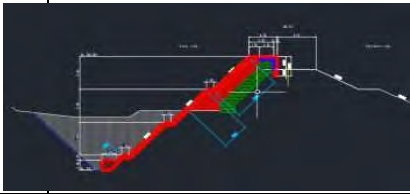
46					
	Formwork Length =	14.09 m'			
	Length =	25.00 m'			
	Volume =	352.25 m2			
	Total Volume =		352.25	m2	

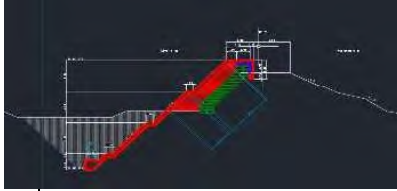
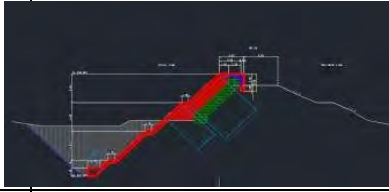
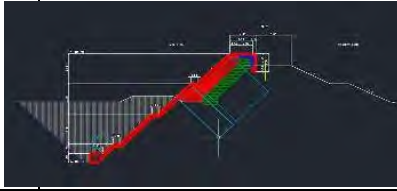
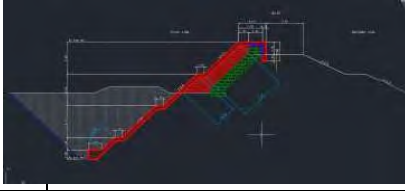


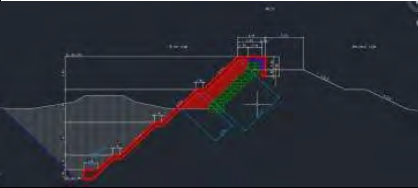
Name Structure :		: Dike Kebondeli XVII			
Type of work :		: Exposed Formwork			
No.	Description	Calculation	Volume	Unit	wing Reference
47					
	Formwork Length =	14.58 m'			
	Length =	25.00 m'			
	Volume =	364.50 m2			
	Total Volume =		364.50	m2	
					
48					
	Formwork Length =	14.83 m'			
	Length =	25.00 m'			
	Volume =	370.75 m2			
	Total Volume =		370.75	m2	
					
49					
	Formwork Length =	12.08 m'			
	Length =	25.00 m'			
	Volume =	302.00 m2			
	Total Volume =		302.00	m2	
					
50					
	Formwork Length =	19.32 m'			
	Length =	25.00 m'			
	Volume =	483.00 m2			
	Total Volume =		483.00	m2	
					
<b>Exposed Formwork Sub Total Volume =</b>			<b>4,139.25</b>	<b>m2</b>	

Name Structure : : Dike Kebondeli XVII					
Type of work : Exposed Formwork					
No.	Description	Calculation	Volume	Unit	wing Reference
51					
	Formwork Length =	15.57 m <sup>2</sup>			
	Length =	25.00 m'			
	Volume =	389.25 m <sup>3</sup>			
			389.25	m2	
					
52					
	Formwork Length =	15.82 m <sup>2</sup>			
	Length =	25.00 m'			
	Volume =	395.50 m <sup>3</sup>			
	Total Volume =		395.50	m2	
					
<b>Exposed Formwork Total Volume = 18,009.50 m2</b>					

Name Structure :		: Dike Kebondeli XVII			
Type of work :		: Non Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
15	Formwork Length =	9.61 m'			
	Length =	25.00 m'			
	Volume =	240.25 m2			
	Total Volume =		240.25	m2	
	le 3 m2 of Formwork and Scaffolding				
					
16	Formwork Length =	10.18 m'			
	Length =	25.00 m'			
	Volume =	254.50 m2			
	Total Volume =		254.50	m2	
					
17	Formwork Length =	9.56 m'			
	Length =	25.00 m'			
	Volume =	239.00 m2			
	Total Volume =		239.00	m2	
					
18	Formwork Length =	9.97 m'			
	Length =	25.00 m'			
	Volume =	249.25 m2			
	Total Volume =		249.25	m2	
					

Name Structure :		: Dike Kebondeli XVII			
Type of work		: Non Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
19	Formwork Length =	11.28 m'			
	Length =	25.00 m'			
	Volume =	282.00 m <sup>2</sup>			
			282.00	m <sup>2</sup>	
					
20	Formwork Length =	11.17 m'			
	Length =	25.00 m'			
	Volume =	279.25 m <sup>2</sup>			
	Total Volume =		279.25	m <sup>2</sup>	
					
21	Formwork Length =	11.07 m'			
	Length =	25.00 m'			
	Volume =	276.75 m <sup>2</sup>			
	Total Volume =		276.75	m <sup>2</sup>	
					
22	Formwork Length =	10.85 m'			
	Length =	25.00 m'			
	Volume =	271.25 m <sup>2</sup>			
	Total Volume =		271.25	m <sup>2</sup>	
					

Name Structure :		: Dike Kebondeli XVII			
Type of work		: Non Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
23	Formwork Length =	10.75 m'			
	Length =	25.00 m'			
	Volume =	268.75 m <sup>2</sup>			
	Total Volume =		268.75	m <sup>2</sup>	
					
24	Formwork Length =	10.75 m'			
	Length =	25.00 m'			
	Volume =	268.75 m <sup>2</sup>			
	Total Volume =		268.75	m <sup>2</sup>	
					
25	Formwork Length =	10.06 m'			
	Length =	25.00 m'			
	Volume =	251.50 m <sup>2</sup>			
	Total Volume =		251.50	m <sup>2</sup>	
					
26	Formwork Length =	10.53 m'			
	Length =	25.00 m'			
	Volume =	263.25 m <sup>2</sup>			
	Total Volume =		263.25	m <sup>2</sup>	
					
<b>Non Exposed Formwork Sub Total Volume =</b>				<b>3,144.50</b>	<b>m<sup>2</sup></b>

Name Structure :		: Dike Kebondeli XVII			
Type of work		: Non Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
27					
	Formwork Length =	10.43 m'			
	Length =	25.00 m'			
	Volume =	260.75 m2			
	Total Volume =		260.75	m2	
					
28					
	Formwork Length =	0.00 m'			
	Length =	25.00 m'			
	Volume =	0.00 m2			
	Total Volume =		-	m2	
29					
	Formwork Length =	0.00 m'			
	Length =	25.00 m'			
	Volume =	0.00 m2			
	Total Volume =		-	m2	
30					
	Formwork Length =	0.00 m'			
	Length =	25.00 m'			
	Volume =	0.00 m2			
	Total Volume =		-	m2	

Name Structure :		: Dike Kebondeli XVII			
Type of work		: Non Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
31	Formwork Length =	0.00 m'			
	Length =	25.00 m'			
	Volume =	0.00 m2			
			-	m2	
32	Formwork Length =	0.00 m'			
	Length =	25.00 m'			
	Volume =	0.00 m2			
	Total Volume =		-	m2	
33	Formwork Length =	0.00 m'			
	Length =	25.00 m'			
	Volume =	0.00 m2			
	Total Volume =		-	m2	
34	Formwork Length =	0.00 m'			
	Length =	25.00 m'			
	Volume =	0.00 m2			
	Total Volume =		-	m2	

Name Structure :		: Dike Kebondeli XVII				
Type of work		: Non Exposed Formwork				
No.	Description	Calculation	Volume	Unit	Drawing Reference	
35	Formwork Length =	0.00 m'				
	Length =	25.00 m'				
	Volume =	0.00 m2				
	Total Volume =		-	m2		
36	Formwork Length =	0.00 m'				
	Length =	25.00 m'				
	Volume =	0.00 m2				
	Total Volume =		-	m2		
37	Formwork Length =	0.00 m'				
	Length =	25.00 m'				
	Volume =	0.00 m2				
	Total Volume =		-	m2		
38	Formwork Length =	0.00 m'				
	Length =	25.00 m'				
	Volume =	0.00 m2				
	Total Volume =		-	m2		
<b>Non Exposed Formwork Sub Total Volume =</b>			<b>260.75</b>	<b>m<sup>2</sup></b>		

Name Structure :		: Dike Kebondeli XVII			
Type of work :		: Non Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
39					
	Formwork Length =	0.00 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	0.00 m <sup>2</sup>			
	Total Volume =		240.25	m <sup>2</sup>	
40					
	Formwork Length =	0.00 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	0.00 m <sup>2</sup>			
	Total Volume =		-	m <sup>2</sup>	
41					
	Formwork Length =	0.00 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	0.00 m <sup>2</sup>			
	Total Volume =		-	m <sup>2</sup>	
42					
	Formwork Length =	0.00 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	0.00 m <sup>2</sup>			
	Total Volume =		-	m <sup>2</sup>	


Name Structure : : Dike Kebondeli XVII					
Type of work : Non Exposed Formwork					
No.	Description	Calculation	Volume	Unit	Drawing Reference
43	Formwork Length =	0.00 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	0.00 m <sup>2</sup>			
			-	m <sup>2</sup>	
44	Formwork Length =	0.00 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	0.00 m <sup>2</sup>			
	Total Volume =		-	m <sup>2</sup>	
45	Formwork Length =	0.00 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	0.00 m <sup>2</sup>			
	Total Volume =		-	m <sup>2</sup>	
46	Formwork Length =	0.00 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	0.00 m <sup>2</sup>			
	Total Volume =		-	m <sup>2</sup>	

Name Structure : : Dike Kebondeli XVII					
Type of work : Non Exposed Formwork					
No.	Description	Calculation	Volume	Unit	Drawing Reference
47	Formwork Length =	0.00 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	0.00 m <sup>2</sup>			
	Total Volume =		-	m <sup>2</sup>	
48	Formwork Length =	0.00 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	0.00 m <sup>2</sup>			
	Total Volume =		-	m <sup>2</sup>	
49	Formwork Length =	0.00 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	0.00 m <sup>2</sup>			
	Total Volume =		-	m <sup>2</sup>	
50	Formwork Length =	0.00 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	Volume =	0.00 m <sup>2</sup>			
	Total Volume =		-	m <sup>2</sup>	
<b>Non Exposed Formwork Sub Total Volume =</b>			<b>240.25</b>	<b>m<sup>2</sup></b>	

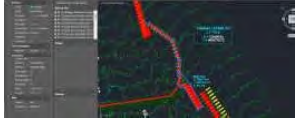
Name Structure : : Dike Kebondeli XVII  
 Type of work : Non Exposed Formwork

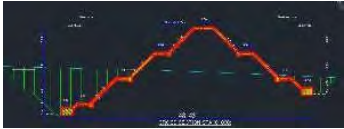
No.	Description	Calculation	Volume	Unit	Drawing Reference
51					
	Formwork Length =	0.00 m'			
	Length =	25.00 m'			
	Volume =	0.00 m2			
			-	m2	
52					
	Formwork Length =	0.00 m'			
	Length =	25.00 m'			
	Volume =	0.00 m2			
	Total Volume =		-	m2	


Non Exposed Formwork Total Volume = 3,384.75 m2

Name Structure :		: Dike Kebondeli XVII			
Type of work :		: Geotextile			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	Dike Span =	925.00			
	Geotextile Length =	16.05	14,846.25	m <sup>2</sup>	
	Carefully dismantle 1 m2 of Formwork and Scaffolding				
	<b>Total Geotextile</b>		<b>14,846.25</b>	<b>m<sup>2</sup></b>	

SUMMARY OF QUANTITY DIKE LEPRAK II-D			
No.	Description	Unit	Volume
1	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	21,863.88
2	1 m Excavation Cross Profile	m	1,501.33
3	Bowplank	m	1,658.86
4	Concrete Making and Casting $f_c' = 20$ Mpa (K 225) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	10,372.18
5	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	12,253.00
6	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	12,253.00
7	Dismantle 1 m2 of Formwork and Scaffolding in the normal way (and Clear Debris) for Non Expose	m2	12,253.00
8	Mechanical Sand Excavation	m3	74,530.64

Name Structure : : Dike Leprak II-D					
Type of work : Stake Out					
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	Area =	21863.88	21,863.88	m <sup>2</sup>	
		<b>Stake Out Total Volume =</b>	<b>21,863.88</b>	<b>m<sup>2</sup></b>	

Name Structure : : Dike Leprak II-D					
Type of work : Cross Profile					
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	Dike width =	48.43			
	Measure each section	31.00	1,501.33	m	
		<b>Cross Profile Total Volume =</b>	<b>1,501.33</b>	<b>m</b>	

Name Structure : : Dike Leprak II-D					
Type of work : Bowplank					
No.	Description	Calculation	Volume	Unit	Drawing Reference
1					
	Profile Length =	1556.00	1,658.86	m	
	Cross Section Length =	102.86			
		<b>Bowplank Total Volume =</b>	<b>1,658.86</b>	<b>m'</b>	

Name Structure :		: Dike Leprak II-D					
Type of work		: Sand Excavation					
No.	Description	Calculation	Volume	Unit	Drawing Reference		
1	Area = Length = V=	163.49 25.000 $(163.49) / 2 \times 25.00$	2,043.58	m <sup>3</sup>			
2	Area = Length = V=	172.37 25.000 $(163.49 + 172.37) / 2 \times 25.00$	4,198.27	m <sup>3</sup>			
3	Area = Length = V=	182.05 25.00 $(172.37 + 182.05) / 2 \times 25.00$	4,430.25	m <sup>3</sup>			
4	Area = Length = V=	193.49 25.00 $(182.05 + 193.49) / 2 \times 25.00$	4,694.14	m <sup>3</sup>			
5	Area = Length = V=	212.21 25.00 $(193.49 + 212.21) / 2 \times 25.00$	5,071.16	m <sup>3</sup>			
6	Area = Length = V=	227.76 25.00 $(212.21 + 227.76) / 2 \times 25.00$	5,499.63	m <sup>3</sup>			
7	Area = Length = V=	287.68 25.00 $(227.76 + 287.68) / 2 \times 25.00$	6,443.01	m <sup>3</sup>			
8	Area = Length = V=	440.02 25.00 $(287.68 + 440.02) / 2 \times 25.00$	9,095.19	m <sup>3</sup>			
9	Area = Length = V=	0.00 25.00 $(440.02 + 0.00) / 2 \times 25.00$	-	m <sup>3</sup>			
10	Area = Length = V=	0.00 25.00 $(0.00 + 0.00) / 2 \times 25.00$	-	m <sup>3</sup>			
11	Area = Length = V=	0.00 25.00 $(0.00 + 0.00) / 2 \times 25.00$	-	m <sup>3</sup>			
12	Area = Length = V=	84.78 25.00 $(0.00 + 84.78) / 2 \times 25.00$	1,059.75	m <sup>3</sup>			
13	Area = Length = V=	102.62 25.00 $(84.78 + 102.62) / 2 \times 25.00$	2,342.53	m <sup>3</sup>			
14	Area = Length = V=	100.75 25.00 $(102.62 + 100.75) / 2 \times 25.00$	2,542.20	m <sup>3</sup>			
15	Area = Length = V=	99.52 25.00 $(100.75 + 99.52) / 2 \times 25.00$	2,503.38	m <sup>3</sup>			

Name Structure :		: Dike Leprak II-D					
Type of work		: Sand Excavation					
No.	Description	Calculation	Volume	Unit	Drawing Reference		
16	Area = Length = V=	91.14 25.00 $(99.52 + 91.14) / 2 \times 25.00$	2,383.27	m <sup>3</sup>			
17	Area = Length = V=	83.53 25.00 $(91.14 + 83.53) / 2 \times 25.00$	2,183.42	m <sup>3</sup>			
18	Area = Length = V=	83.70 25.00 $(83.53 + 83.70) / 2 \times 25.00$	2,090.34	m <sup>3</sup>			
19	Area = Length = V=	83.87 25.00 $(83.70 + 83.87) / 2 \times 25.00$	2,094.59	m <sup>3</sup>			
20	Area = Length = V=	84.04 25.00 $(83.87 + 84.04) / 2 \times 25.00$	2,098.91	m <sup>3</sup>			
21	Area = Length = V=	67.33 25.00 $(84.04 + 67.33) / 2 \times 25.00$	1,892.23	m <sup>3</sup>			
22	Area = Length = V=	66.44 25.00 $(67.33 + 66.44) / 2 \times 25.00$	1,672.12	m <sup>3</sup>			
23	Area = Length = V=	47.46 25.00 $(66.44 + 47.46) / 2 \times 25.00$	1,423.73	m <sup>3</sup>			
24	Area = Length = V=	47.57 25.00 $(47.46 + 47.57) / 2 \times 25.00$	1,187.90	m <sup>3</sup>			
25	Area = Length = V=	47.68 25.00 $(47.57 + 47.68) / 2 \times 25.00$	1,190.64	m <sup>3</sup>			
26	Area = Length = V=	47.80 25.00 $(47.68 + 47.80) / 2 \times 25.00$	1,193.51	m <sup>3</sup>			
27	Area = Length = V=	57.46 25.00 $(47.80 + 57.46) / 2 \times 25.00$	1,315.76	m <sup>3</sup>			
28	Area = Length = V=	48.04 25.00 $(57.46 + 48.04) / 2 \times 25.00$	1,318.77	m <sup>3</sup>			
29	Area = Length = V=	33.66 25.00 $(48.04 + 33.66) / 2 \times 25.00$	1,021.26	m <sup>3</sup>			
30	Area = Length = V=	33.52 25.00 $(33.66 + 33.52) / 2 \times 25.00$	839.73	m <sup>3</sup>			
31	Area = Length = V=	22.51 25.00 $(33.52 + 22.51) / 2 \times 25.00$	700.38	m <sup>3</sup>			
<b>Sand Excavation Total Volume =</b>			<b>74,530.64</b>	<b>m<sup>3</sup></b>			


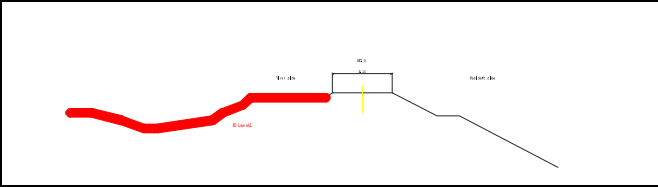
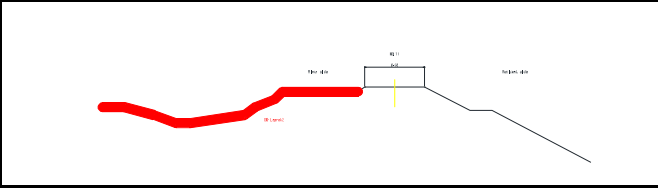
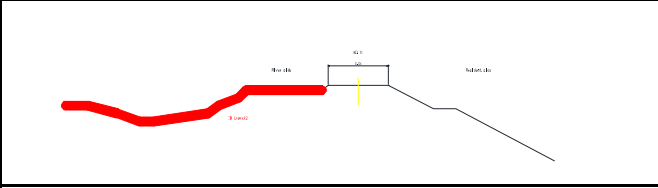
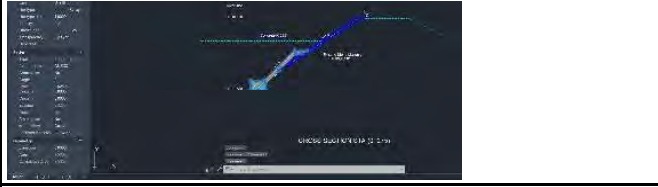


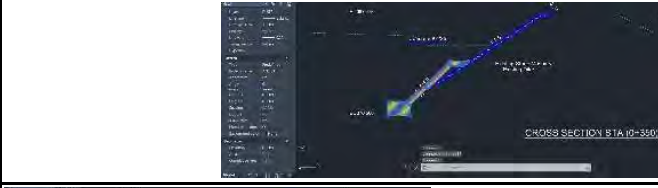

Name Structure :		: Dike Leprak II-D
Type of work		: Concrete K-225
No.	Description	Calculation
1		
	Area =	36.55
	Length =	25.000
		$V = (36.55) / 2 \times 25.00$
2		
	Area =	36.77
	Length =	25.000
		$V = (36.55 + 36.77) / 2 \times 25.00$
3		
	Area =	37.28
	Length =	25.00
		$V = (36.77 + 37.28) / 2 \times 25.00$
4		
	Area =	37.19
	Length =	25.00
		$V = (37.28 + 37.19) / 2 \times 25.00$
5		
	Area =	37.40
	Length =	25.00
		$V = (37.19 + 37.40) / 2 \times 25.00$
6		
	Area =	37.60
	Length =	25.00
		$V = (37.40 + 37.60) / 2 \times 25.00$
7		
	Area =	37.12
	Length =	25.00
		$V = (37.60 + 37.12) / 2 \times 25.00$
8		
	Area =	36.61

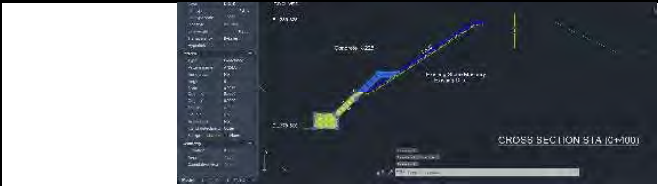

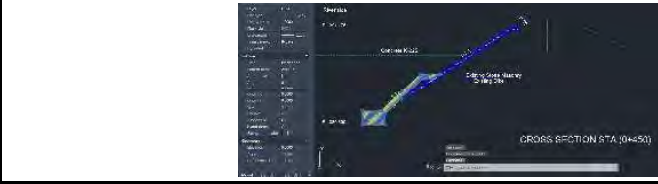






	Length =	25.00
		$V = (37.12 + 36.61) / 2 \times 25.00$
9		
	Area =	0.00
	Length =	25.00
		$V = (36.61 + 0.00) / 2 \times 25.00$
10		
	Area =	0.00
	Length =	25.00
		$V = (0.00 + 0.00) / 2 \times 25.00$
11		
	Area =	0.00
	Length =	25.00
		$V = (0.00 + 0.00) / 2 \times 25.00$
12		
	Area =	7.50
	Length =	25.00
		$V = (0.00 + 7.50) / 2 \times 25.00$
13		
	Area =	7.45
	Length =	25.00
		$V = (7.50 + 7.45) / 2 \times 25.00$
14		
	Area =	7.39
	Length =	25.00
		$V = (7.45 + 7.39) / 2 \times 25.00$
15		
	Area =	7.34
	Length =	25.00
		$V = (7.39 + 7.34) / 2 \times 25.00$
16		
	Area =	7.29
	Length =	25.00
		$V = (7.34 + 7.29) / 2 \times 25.00$


17		
	Area =	7.24
	Length =	25.00
		$V = (7.29 + 7.24) / 2 \times 25.00$
18		
	Area =	7.18
	Length =	25.00
		$V = (7.24 + 7.18) / 2 \times 25.00$
19		
	Area =	7.13
	Length =	25.00
		$V = (7.18 + 7.13) / 2 \times 25.00$
20		
	Area =	7.08
	Length =	25.000
		$V = (7.13 + 7.08) / 2 \times 25.00$
21		
	Area =	7.02
	Length =	25.000
		$V = (7.08 + 7.02) / 2 \times 25.00$
22		
	Area =	6.97
	Length =	25.00
		$V = (7.02 + 6.97) / 2 \times 25.00$
23		
	Area =	6.92
	Length =	25.00
		$V = (6.97 + 6.92) / 2 \times 25.00$
24		
	Area =	6.86
	Length =	25.00
		$V = (6.92 + 6.86) / 2 \times 25.00$
25		
	Area =	6.81

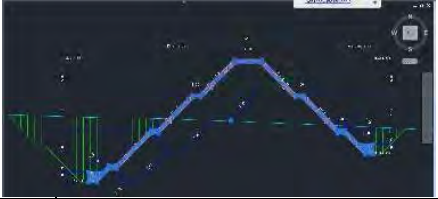
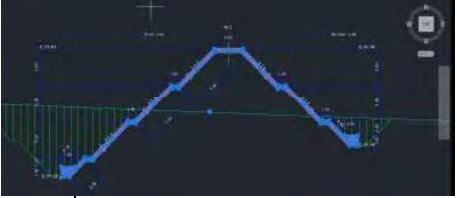
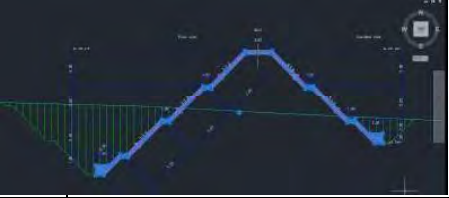

	Length =	25.00
		$V = (6.86 + 6.81) / 2 \times 25.00$
26		
	Area =	6.76
	Length =	25.00
		$V = (6.81 + 6.76) / 2 \times 25.00$
27		
	Area =	6.70
	Length =	25.00
		$V = (6.76 + 6.70) / 2 \times 25.00$
28		
	Area =	6.65
	Length =	25.00
		$V = (6.70 + 6.65) / 2 \times 25.00$
29		
	Area =	6.60
	Length =	25.00
		$V = (6.65 + 6.60) / 2 \times 25.00$
30		
	Area =	6.55
	Length =	25.00
		$V = (6.60 + 6.55) / 2 \times 25.00$
31		
	Area =	6.49
	Length =	25.00
		$V = (6.55 + 6.49) / 2 \times 25.00$
		Concrete K-225 Total Volume =

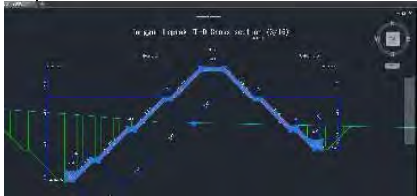
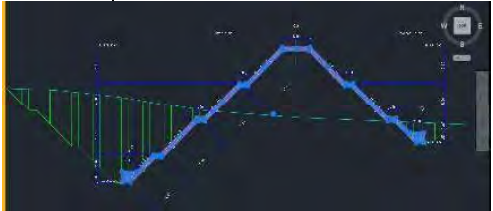
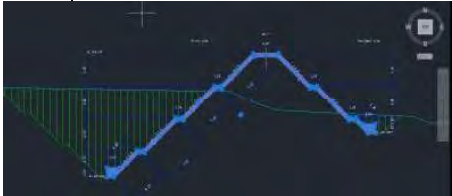
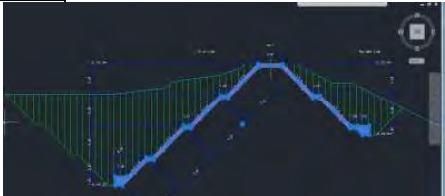
Volume	Unit	Drawing Reference
456.87	m <sup>3</sup>	
916.47	m <sup>3</sup>	
925.63	m <sup>3</sup>	
930.86	m <sup>3</sup>	
932.30	m <sup>3</sup>	
937.50	m <sup>3</sup>	
933.97	m <sup>3</sup>	
		

921.56	m <sup>3</sup>	
-	m <sup>3</sup>	
-	m <sup>3</sup>	
-	m <sup>3</sup>	
93.75	m <sup>3</sup>	
186.84	m <sup>3</sup>	
185.52	m <sup>3</sup>	
184.19	m <sup>3</sup>	
182.86	m <sup>3</sup>	

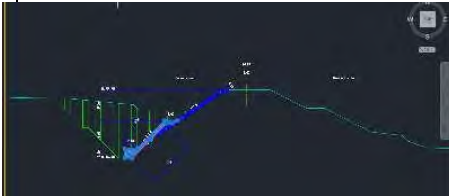

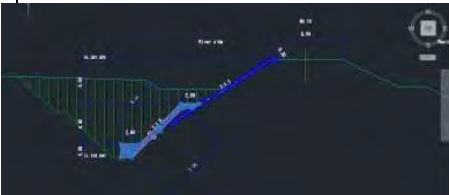

181.54	m <sup>3</sup>	
180.21	m <sup>3</sup>	
178.89	m <sup>3</sup>	
177.56	m <sup>3</sup>	
176.24	m <sup>3</sup>	
174.91	m <sup>3</sup>	
173.58	m <sup>3</sup>	
172.26	m <sup>3</sup>	
		

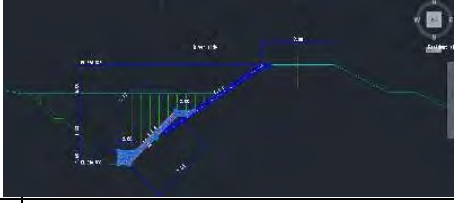
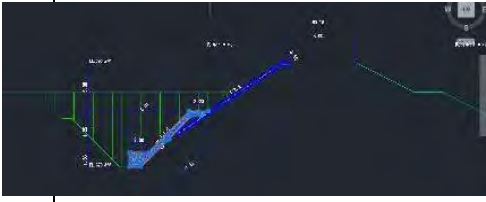

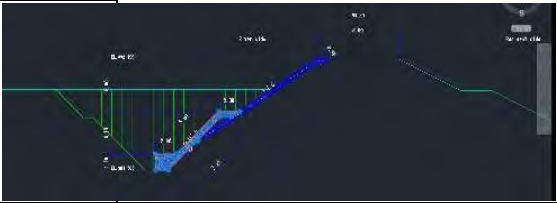
			
170.93	m <sup>3</sup>		
			
169.61	m <sup>3</sup>		
			
168.28	m <sup>3</sup>		
			
166.96	m <sup>3</sup>		
			
165.63	m <sup>3</sup>		
			
164.30	m <sup>3</sup>		
			
162.98	m <sup>3</sup>		
10,372.18	m <sup>3</sup>		


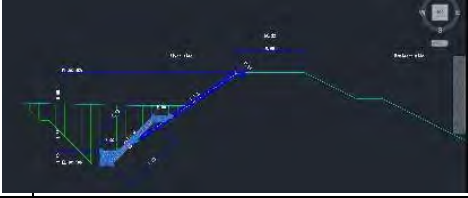
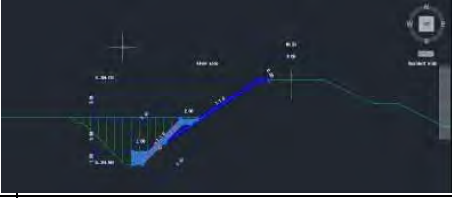

Name Structure :		: Dike Leprak II-D			
Type of work		: Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	Formwork Length =	42.29 m'			
	Length =	25.00 m'			
		V= 1057.25 m <sup>2</sup>			
	Total Volume =		1,057.25	m2	
					
2	Formwork Length =	42.91 m'			
	Length =	25.00 m'			
		V= 1072.75 m <sup>2</sup>			
	Total Volume =		1,072.75	m2	
					
3	Formwork Length =	43.34 m'			
	Length =	25.00 m'			
		V= 1083.50 m <sup>2</sup>			
	Total Volume =		1,083.50	m2	
					
4	Formwork Length =	43.76 m'			
	Length =	25.00 m'			
		V= 1094.00 m <sup>2</sup>			
	Total Volume =		1,094.00	m2	
					

Name Structure :		: Dike Leprak II-D			
Type of work :		: Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
5	Formwork Length =	44.19 m			
	Length =	25.00 m			
	V=	1104.75 m <sup>2</sup>			
			1,104.75	m <sup>2</sup>	
					
6	Formwork Length =	44.61 m			
	Length =	25.00 m			
	V=	1115.25 m <sup>2</sup>			
	Total Volume =		1,115.25	m <sup>2</sup>	
					
7	Formwork Length =	43.61 m			
	Length =	25.00 m			
	V=	1090.25 m <sup>2</sup>			
	Total Volume =		1,090.25	m <sup>2</sup>	
					
8	Formwork Length =	42.63 m			
	Length =	25.00 m			
	V=	1065.75 m <sup>2</sup>			
	Total Volume =		1,065.75	m <sup>2</sup>	
					


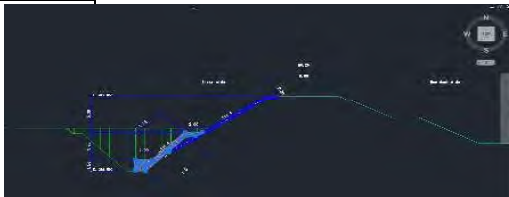


Name Structure :		: Dike Leprak II-D			
Type of work :		: Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
9	Formwork Length =	0.00 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	V=	0.00 m <sup>2</sup>			
	Total Volume =		-	m <sup>2</sup>	
10	Formwork Length =	0.00 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	V=	0.00 m <sup>2</sup>			
	Total Volume =		-	m <sup>2</sup>	
11	Formwork Length =	0.00 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	V=	0.00 m <sup>2</sup>			
	Total Volume =		-	m <sup>2</sup>	
12	Formwork Length =	8.15 m <sup>1</sup>			
	Length =	25.00 m <sup>1</sup>			
	V=	203.75 m <sup>2</sup>			
	Total Volume =		203.75	m <sup>2</sup>	
Exposed Formwork Sub Total Volume =			8,887.25	m <sup>2</sup>	

Name Structure :		: Dike Leprak II-D				
Type of work		: Exposed Formwork				
No.	Description	Calculation	Volume	Unit	Drawing Reference	
13						
	Formwork Length =	8.04 m'				
	Length =	25.00 m'				
	V=	201.00 m <sup>2</sup>				
	Total Volume =		201.00	m2		
14						
	Formwork Length =	7.93 m'				
	Length =	25.00 m'				
	V=	198.25 m <sup>2</sup>				
	Total Volume =		198.25	m2		
15						
	Formwork Length =	7.83 m'				
	Length =	25.00 m'				
	V=	195.75 m <sup>2</sup>				
	Total Volume =		195.75	m2		
16						
	Formwork Length =	7.72 m'				
	Length =	25.00 m'				
	V=	193.00 m <sup>2</sup>				
	Total Volume =		193.00	m2		


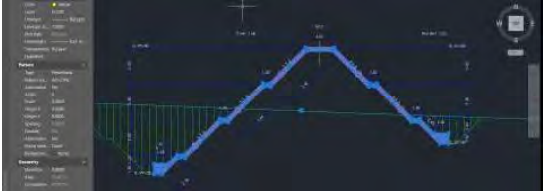

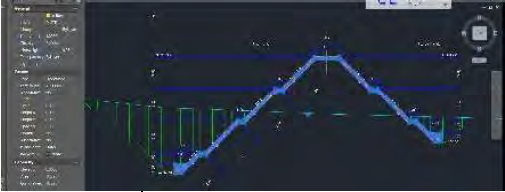
Name Structure :		: Dike Leprak II-D				
Type of work		: Exposed Formwork				
No.	Description	Calculation	Volume	Unit	Drawing Reference	
17						
	Formwork Length =	7.62 m'				
	Length =	25.00 m'				
	V=	190.50 m <sup>2</sup>				
			190.50	m <sup>2</sup>		
18						
	Formwork Length =	7.51 m'				
	Length =	25.00 m'				
	V=	187.75 m <sup>2</sup>				
	Total Volume =		187.75	m <sup>2</sup>		
19						
	Formwork Length =	7.40 m'				
	Length =	25.00 m'				
	V=	185.00 m <sup>2</sup>				
	Total Volume =		185.00	m <sup>2</sup>		
20						
	Formwork Length =	7.30 m'				
	Length =	25.00 m'				
	V=	182.50 m <sup>2</sup>				
	Total Volume =		182.50	m <sup>2</sup>		

Name Structure :		: Dike Leprak II-D				
Type of work		: Exposed Formwork				
No.	Description	Calculation	Volume	Unit	Drawing Reference	
21						
	Formwork Length =	7.19 m'				
	Length =	25.00 m'				
	V=	179.75 m <sup>2</sup>				
	Total Volume =		179.75	m <sup>2</sup>		
22						
	Formwork Length =	7.09 m'				
	Length =	25.00 m'				
	V=	177.25 m <sup>2</sup>				
	Total Volume =		177.25	m <sup>2</sup>		
23						
	Formwork Length =	6.98 m'				
	Length =	25.00 m'				
	V=	174.50 m <sup>2</sup>				
	Total Volume =		174.50	m <sup>2</sup>		
24						
	Formwork Length =	6.87 m'				
	Length =	25.00 m'				
	V=	171.75 m <sup>2</sup>				
	Total Volume =		171.75	m <sup>2</sup>		
<b>Exposed Formwork Sub Total Volume =</b>			<b>2,237.00</b>	<b>m<sup>2</sup></b>		

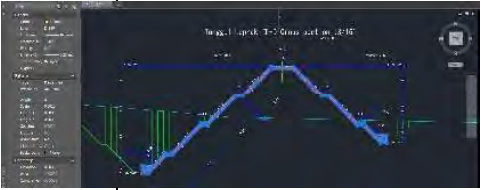
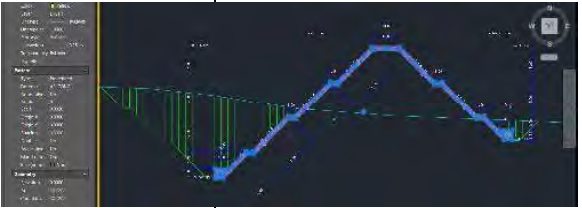
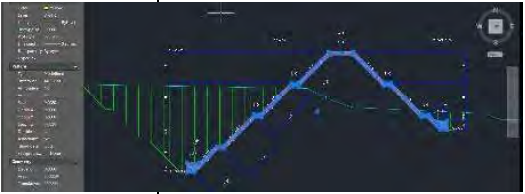
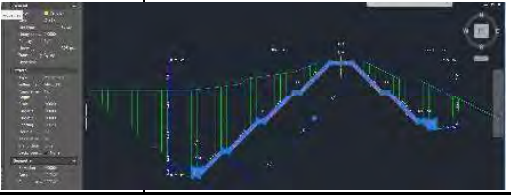
Name Structure : : Dike Leprak II-D  
 Type of work : Exposed Formwork

No.	Description	Calculation	Volume	Unit	Drawing Reference
25					
	Formwork Length	6.77 m'			
	Length =	25.00 m'			
	V=	169.25 m <sup>2</sup>			
	Total Volume =		169.25	m2	
26					
	Formwork Length	6.66 m'			
	Length =	25.00 m'			
	V=	166.50 m <sup>2</sup>			
	Total Volume =		166.50	m2	
27					
	Formwork Length	6.56 m'			
	Length =	25.00 m'			
	V=	164.00 m <sup>2</sup>			
	Total Volume =		164.00	m2	
28					
	Formwork Length	6.45 m'			
	Length =	25.00 m'			
	V=	161.25 m <sup>2</sup>			
	Total Volume =		161.25	m2	

Name Structure :		: Dike Leprak II-D				
Type of work :		: Exposed Formwork				
No.	Description	Calculation	Volume	Unit	Drawing Reference	
29						
	Formwork Length	6.34 m'				
	Length =	25.00 m'				
	V=	158.50 m <sup>2</sup>				
			158.50	m2		
30						
	Formwork Length	6.24 m'				
	Length =	25.00 m'				
	V=	156.00 m <sup>2</sup>				
	Total Volume =		156.00	m2		
31						
	Formwork Length	6.13 m'				
	Length =	25.00 m'				
	V=	153.25 m <sup>2</sup>				
	Total Volume =		153.25	m2		
<b>Exposed Formwork Total Volume =</b>			<b>12,253.00</b>	<b>m2</b>		

Name Structure :		: Dike Leprak II-D			
Type of work :		: Concrete K-225			
No.	Description	Calculation	Volume	Unit	Drawing Reference
0	Area =	29.66 m <sup>2</sup>			
	Length =	25.00 m'			
		V= 741.50 m <sup>3</sup>			
	Total Volume =		741.50	m <sup>3</sup>	
					
2	Area =	29.87 m <sup>2</sup>			
	Length =	25.00 m'			
		V= 746.75 m <sup>3</sup>			
	Total Volume =		746.75	m <sup>3</sup>	
					
3	Area =	30.08 m <sup>2</sup>			
	Length =	25.00 m'			
		V= 752.00 m <sup>3</sup>			
	Total Volume =		752.00	m <sup>3</sup>	
					
4	Area =	30.30 m <sup>2</sup>			
	Length =	25.00 m'			
		V= 757.50 m <sup>3</sup>			
	Total Volume =		757.50	m <sup>3</sup>	
					

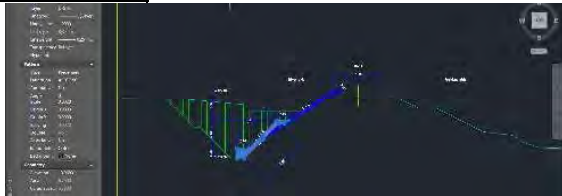
Name Structure : : Dike Leprak II-D  
 Type of work : Concrete K-225

No.	Description	Calculation	Volume	Unit	Drawing Reference
5	Area =	30.51 m <sup>2</sup>			
	Length =	25.00 m'			
	V=	762.75 m <sup>3</sup>			
			762.75	m <sup>3</sup>	
					
6	Area =	30.72 m <sup>2</sup>			
	Length =	25.00 m'			
	V=	768.00 m <sup>3</sup>			
	Total Volume =		768.00	m <sup>3</sup>	
					
7	Area =	30.23 m <sup>2</sup>			
	Length =	25.00 m'			
	V=	755.75 m <sup>3</sup>			
	Total Volume =		755.75	m <sup>3</sup>	
					
8	Area =	29.73 m <sup>2</sup>			
	Length =	25.00 m'			
	V=	743.25 m <sup>3</sup>			
	Total Volume =		743.25	m <sup>3</sup>	
					

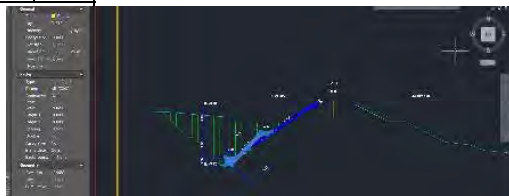
Name Structure :		: Dike Leprak II-D			
Type of work :		: Concrete K-225			
No.	Description	Calculation	Volume	Unit	Drawing Reference
9	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m'			
	V=	0.00 m <sup>3</sup>			
	Total Volume =			m <sup>3</sup>	
10	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m'			
	V=	0.00 m <sup>3</sup>			
	Total Volume =			m <sup>3</sup>	
11	Area =	0.00 m <sup>2</sup>			
	Length =	25.00 m'			
	V=	0.00 m <sup>3</sup>			
	Total Volume =			m <sup>3</sup>	
12	Area =	6.84 m <sup>2</sup>			
	Length =	25.00 m'			
	V=	171.00 m <sup>3</sup>			
	Total Volume =		171.00	m <sup>3</sup>	
		K-225 Concrete Sub Total Volume =		6,198.50 m <sup>3</sup>	

Name Structure : Dike Leprak II-D  
 Type of work : Concrete K-225

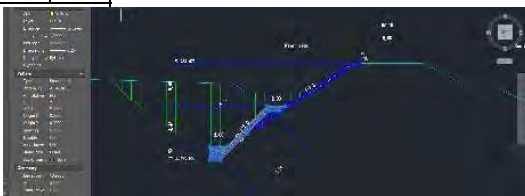
No.	Description	Calculation	Volume	Unit	Swing Reference
13					
	Area =	6.79 m <sup>2</sup>			
	Length =	25.00 m			
		V= 169.75 m <sup>3</sup>			
	Total Volume =		169.75	m <sup>3</sup>	



14					
	Area =	6.74 m <sup>2</sup>			
	Length =	25.00 m			
		V= 168.50 m <sup>3</sup>			
	Total Volume =		168.50	m <sup>3</sup>	



15					
	Area =	6.68 m <sup>2</sup>			
	Length =	25.00 m			
		V= 167.00 m <sup>3</sup>			
	Total Volume =		167.00	m <sup>3</sup>	

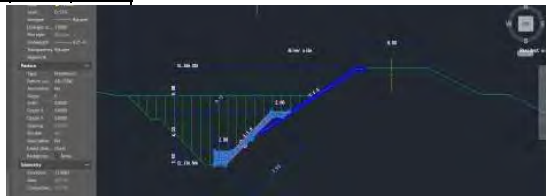


16					
	Area =	6.63 m <sup>2</sup>			
	Length =	25.00 m			
		V= 165.75 m <sup>3</sup>			
	Total Volume =		165.75	m <sup>3</sup>	

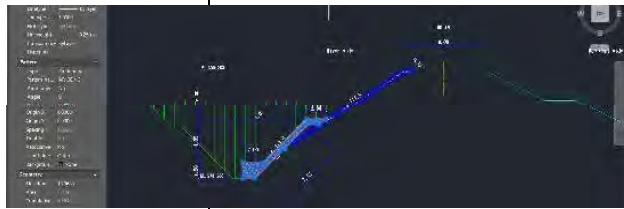


Name Structure : : Dike Leprak II-D  
 Type of work : Concrete K-225

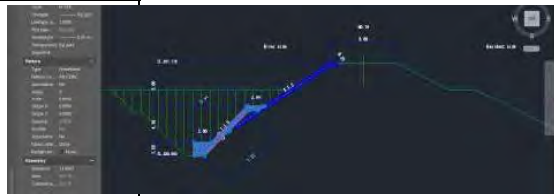
No.	Description	Calculation	Volume	Unit	Swing Reference
13					
17	Area =	6.58 m <sup>2</sup>			
	Length =	25.00 m			
	V=	164.50 m <sup>3</sup>			
			164.50	m <sup>3</sup>	



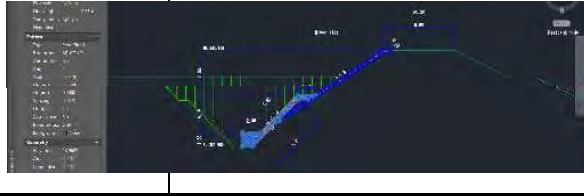
18	Area =	6.52 m <sup>2</sup>			
	Length =	25.00 m			
	V=	163.00 m <sup>3</sup>			
	Total Volume =		163.00	m <sup>3</sup>	



19	Area =	6.47 m <sup>2</sup>			
	Length =	25.00 m			
	V=	161.75 m <sup>3</sup>			
	Total Volume =		161.75	m <sup>3</sup>	



20	Area =	6.42 m <sup>2</sup>			
	Length =	25.00 m			
	V=	160.50 m <sup>3</sup>			
	Total Volume =		160.50	m <sup>3</sup>	



Name Structure : : Dike Leprak II-D  
 Type of work : Concrete K-225

No.	Description	Calculation	Volume	Unit	Swing Reference
13					
21	Area =	6.37 m <sup>2</sup>			
	Length =	25.00 m			
		V= 159.25 m <sup>3</sup>			
	Total Volume =		159.25	m <sup>3</sup>	



22	Area =	6.31 m <sup>2</sup>			
	Length =	25.00 m			
		V= 157.75 m <sup>3</sup>			
	Total Volume =		157.75	m <sup>3</sup>	







23	Area =	6.23 m <sup>2</sup>			
	Length =	25.00 m			
		V= 155.75 m <sup>3</sup>			
	Total Volume =		155.75	m <sup>3</sup>	

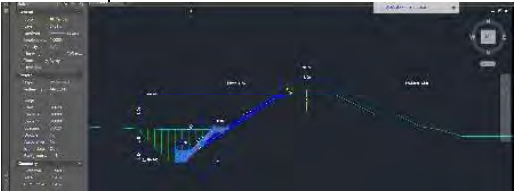
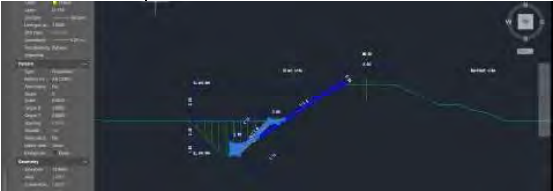



24	Area =	6.20 m <sup>2</sup>			
	Length =	25.00 m			
		V= 155.00 m <sup>3</sup>			
	Total Volume =		155.00	m <sup>3</sup>	

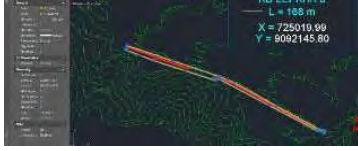


<b>K-225 Concrete Sub Total Volume =</b>			<b>1,948.50</b>	<b>m<sup>3</sup></b>	
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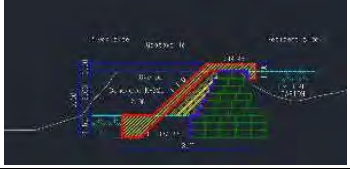
Name Structure :		: Dike Leprak II-D			
Type of work		: Concrete K-225			
No.	Description	Calculation	Volume	Unit	Drawing Reference
25					
	Area =	6.15 m <sup>2</sup>			
	Length =	25.00 m			
	V=	153.75 m <sup>3</sup>			
	Total Volume =		153.75	m <sup>3</sup>	
					
26					
	Area =	6.10 m <sup>2</sup>			
	Length =	25.00 m			
	V=	152.50 m <sup>3</sup>			
	Total Volume =		152.50	m <sup>3</sup>	
					
27					
	Area =	6.05 m <sup>2</sup>			
	Length =	25.00 m			
	V=	151.25 m <sup>3</sup>			
	Total Volume =		151.25	m <sup>3</sup>	
					
28					
	Area =	6.00 m <sup>2</sup>			
	Length =	25.00 m			
	V=	150.00 m <sup>3</sup>			
	Total Volume =		150.00	m <sup>3</sup>	
					

Name Structure :		: Dike Leprak II-D			
Type of work		: Concrete K-225			
No.	Description	Calculation	Volume	Unit	Drawing Reference
25					
29	Area =	5.94 m <sup>2</sup>			
	Length =	25.00 m			
	V=	148.50 m <sup>3</sup>			
			148.50	m <sup>3</sup>	
					
30					
	Area =	5.89 m <sup>2</sup>			
	Length =	25.00 m			
	V=	147.25 m <sup>3</sup>			
	Total Volume =		147.25	m <sup>3</sup>	
					
31					
	Area =	5.84 m <sup>2</sup>			
	Length =	25.00 m			
	V=	145.89 m <sup>3</sup>			
	Total Volume =		145.89	m <sup>3</sup>	
					
<b>K-225 Concrete Total Volume =</b>			<b>9,196.14</b>	<b>m<sup>3</sup></b>	





SUMMARY QUANTITY EMERGENCY DIKE			
No.	Description	Unit	Volume
1	Stake Out	m2	3,928.04
2	Cross Profile	m	174.20
3	Bowplank	m	860.32
4	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	3,845.35
5	Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Split Stone, with Concrete Pump (CP)	m3	2,062.50
6	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	3,725.00
7	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	5,846.30
8	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	3,725.00
9	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	2,121.30
10	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	2,121.30
11	Mechanical Sand Excavation	m3	11,325.35
12	Sand Backfill	m3	732.16





Name Structure : : Emergency Dike					
Type of work : Stake Out					
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	Area =	3928.04	3,928.04	m <sup>2</sup>	
	<b>Total Area Stake Out</b>		<b>3,928.04</b>	<b>m<sup>2</sup></b>	

Name Structure : : Emergency Dike					
Type of work : : Cross Profile					
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	Numbers of Section = 20.00 Cross Length = 8.710		174.20	m'	
	<b>Total</b>		<b>174.20</b>	<b>m</b>	


Name Structure :           : Emergency Dike					
Type of work               : Bowplank					
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	Profile Length =	836.90	860.32	m	
	Cross Section Length =	23.42			
	Total =		860.32	m'	

Name Structure :		: Emergency Dike (Dike 1)			
Type of work :		: Sand Excavation			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	0+000				
	Area =	34.88			
	Length =	25.000			
	V=	$(34,88) / 2 \times 25,00$	436.04	m³	
2	0+025				
	Area =	28.22			
	Length =	25.000			
	V=	$(34,88 + 28,22) / 2 \times 25,00$	788.83	m³	
3	0+050				
	Area =	25.20			
	Length =	25.00			
	V=	$(25,20 + 25,20) / 2 \times 25,00$	629.91	m³	
4	0+075				
	Area =	21.65			
	Length =	25.00			
	V=	$(25,20 + 21,65) / 2 \times 25,00$	585.64	m³	
5	0+100				
	Area =	26.04			
	Length =	25.00			
	V=	$(21,65 + 26,04) / 2 \times 25,00$	596.22	m³	
6	0+125				
	Area =	26.41			
	Length =	25.00			
	V=	$(26,04 + 26,41) / 2 \times 25,00$	655.62	m³	
7	0+150				
	Area =	26.18			
	Length =	25.00			
	V=	$(26,41 + 26,18) / 2 \times 25,00$	657.30	m³	
8	0+175				
	Area =	23.10			
	Length =	25.00			
	V=	$(26,18 + 23,10) / 2 \times 25,00$	615.94	m³	
9	0+200				
	Area =	24.68			
	Length =	25.00			
	V=	$(23,10 + 24,68) / 2 \times 25,00$	597.23	m³	
10	0+225				
	Area =	23.30			
	Length =	25.00			
	V=	$(24,68 + 23,30) / 2 \times 25,00$	599.70	m³	
11	0+250				
	Area =	18.32			
	Length =	25.00			
	V=	$(23,30 + 18,32) / 2 \times 25,00$	520.18	m³	
12	0+263,75				
	Area =	2.63			
	Length =	25.00			
	V=	$(18,32 + 2,63) / 2 \times 25,00$	261.80	m³	
Sand Excavation Dike 1 Sub Total Volume =			6,944.39	m³	

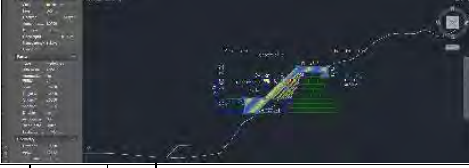

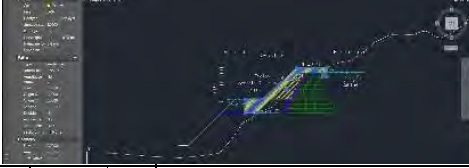
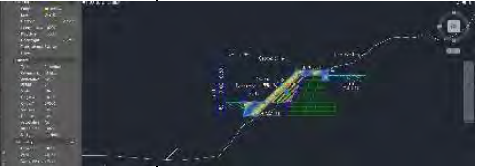
Name Structure :		: Emergency Dike (Dike 2)			
Type of work :		: Sand Excavation			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	0+275				
	Area =	2.50			
	Length =	25.000			
	V=	$(2,50) / 2 \times 25,00$	31.29	m <sup>3</sup>	
2	0+300				
	Area =	25.78			
	Length =	25.000			
	V=	$(2,50 + 25,78) / 2 \times 25,00$	353.50	m <sup>3</sup>	
3	0+325				
	Area =	31.67			
	Length =	25.00			
	V=	$(31,67 + 31,67) / 2 \times 25,00$	791.71	m <sup>3</sup>	
4	0+345				
	Area =	32.16			
	Length =	25.00			
	V=	$(31,67 + 32,16) / 2 \times 25,00$	797.88	m <sup>3</sup>	
		<b>Sand Excavation Dike 2 Sub Total Volume =</b>	<b>1,974.38</b>	<b>m<sup>3</sup></b>	

Name Structure :		: Emergency Dike (Dike 3)			
Type of work :		: Sand Excavation			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	0+350				
	Area =	27.40			
	Length =	25.000			
	V=	(27,40) / 2 x 25,00	342.50	m³	
2	0+375				
	Area =	39.50			
	Length =	25.000			
	V=	(27,40 + 29,50) / 2 x 25,00	711.30	m³	
3	0+400				
	Area =	26.57			
	Length =	25.00			
	V=	(26,57 + 26,57) / 2 x 25,00	664.26	m³	
4	0+415,5				
	Area =	28.51			
	Length =	25.00			
	V=	(26,57 + 28,51) / 2 x 25,00	688.52	m³	
		<b>Sand Excavation Dike 3 Sub Total Volume =</b>	<b>2,406.58</b>	<b>m³</b>	
		<b>Sand Excavation Total Volume =</b>	<b>11,325.35</b>	<b>m³</b>	

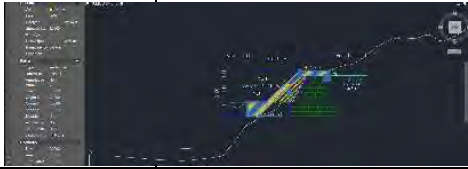
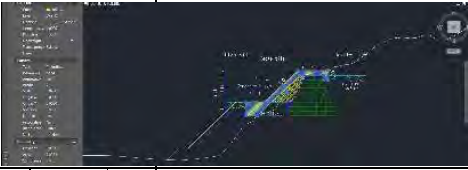
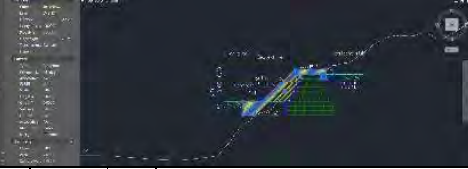
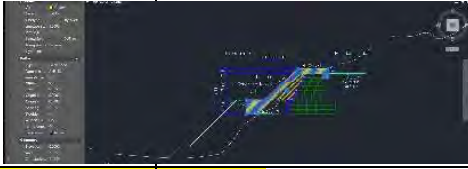
Name Structure :		: Emergency Dike (Dike 1)			
Type of work :		: Backfill			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	0+000				
	Luas	0,00			
	Panjang	25,000			
		$V = (0,00) / 2 \times 25,00$	-	m <sup>3</sup>	
2	0+025				
	Luas	0,00			
	Panjang	25,000			
		$V = (0,00 + 0,00) / 2 \times 25,00$	-	m <sup>3</sup>	
3	0+050				
	Luas	0,00			
	Panjang	25,00			
		$V = (0,00 + 0,00) / 2 \times 25,00$	-	m <sup>3</sup>	
4	0+075				
	Luas	0,00			
	Panjang	25,00			
		$V = (0,00 + 0,00) / 2 \times 25,00$	-	m <sup>3</sup>	
5	0+100				
	Luas	0,00			
	Panjang	25,000			
		$V = (0,00 + 0,00) / 2 \times 25,00$	-	m <sup>3</sup>	
6	0+125				
	Luas	0,00			
	Panjang	25,000			
		$V = (0,00 + 0,00) / 2 \times 25,00$	-	m <sup>3</sup>	
7	0+150				
	Luas	0,00			
	Panjang	25,000			
		$V = (0,00 + 0,00) / 2 \times 25,00$	-	m <sup>3</sup>	
8	0+175				
	Luas	0,00			
	Panjang	25,000			
		$V = (0,00 + 0,00) / 2 \times 25,00$	-	m <sup>3</sup>	
9	0+200				
	Luas	0,00			
	Panjang	25,00			
		$V = (0,00 + 0,00) / 2 \times 25,00$	-	m <sup>3</sup>	
10	0+225				
	Luas	0,00			
	Panjang	25,00			
		$V = (0,00 + 0,00) / 2 \times 25,00$	-	m <sup>3</sup>	
11	0+250				
	Luas	0,00			
	Panjang	25,00			
		$V = (0,00 + 0,00) / 2 \times 25,00$	-	m <sup>3</sup>	
12	0+263,75				
	Luas	6,86			
	Panjang	25,00			
		$V = (0,00 + 6,86) / 2 \times 25,00$	85,74	m <sup>3</sup>	
<b>Backfill Dike 1 Total Volume =</b>			<b>85,74</b>	<b>m<sup>3</sup></b>	

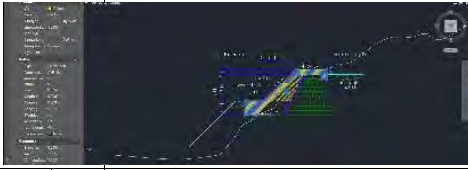

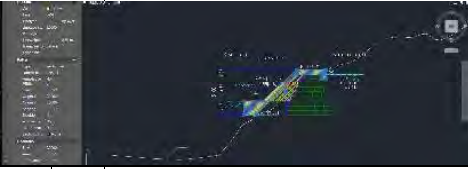
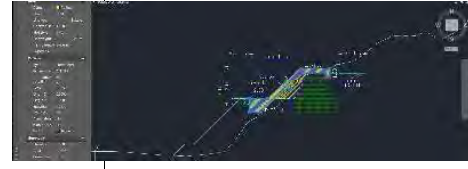
Name Structure :		: Emergency Dike (Dike 2)				
Type of work :		: Backfill				
No.	Description	Calculation	Volume	Unit	Drawing Reference	
1	0+000					
	Luas	25.86				
	Panjang	25.000				
	V=	$(25,86) / 2 \times 25,00$	323.21	m <sup>3</sup>		
2	0+025					
	Luas	0.00				
	Panjang	25.000				
	V=	$(25,86 + 0,00) / 2 \times 25,00$	323.21	m <sup>3</sup>		
3	0+050					
	Luas	0.00				
	Panjang	25.00				
	V=	$(0,00 + 0,00) / 2 \times 25,00$	-	m <sup>3</sup>		
4	0+075					
	Luas	0.00				
	Panjang	25.00				
	V=	$(0,00 + 0,00) / 2 \times 25,00$	-	m <sup>3</sup>		
			<b>Backfill Dike 2 Total Volume =</b>	<b>646.42</b>	<b>m<sup>3</sup></b>	

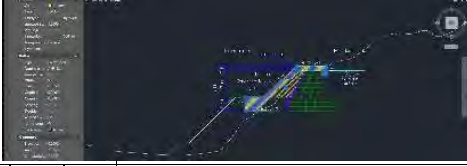
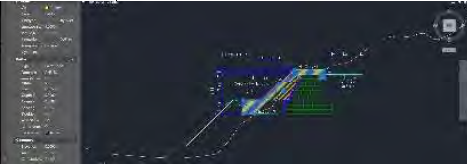
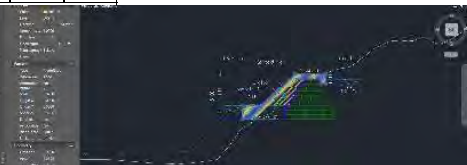

Name Structure :		: Emergency Dike (Dike 3)			
Type of work :		: Backfill			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	0+000				
	Luas	0,00			
	Panjang	25,000			
		$V = (0,00) / 2 \times 25,00$	-	m <sup>3</sup>	
2	0+025				
	Luas	0,00			
	Panjang	25,000			
		$V = (0,00 + 0,00) / 2 \times 25,00$	-	m <sup>3</sup>	
3	0+050				
	Luas	0,00			
	Panjang	25,00			
		$V = (0,00 + 0,00) / 2 \times 25,00$	-	m <sup>3</sup>	
4	0+075				
	Luas	0,00			
	Panjang	25,00			
		$V = (0,00 + 0,00) / 2 \times 25,00$	-	m <sup>3</sup>	
<b>Backfill Dike 3 Total Volume =</b>			-	m <sup>3</sup>	
<b>Backfill Total Volume =</b>			<b>732,16</b>	<b>m<sup>3</sup></b>	

Name Structure :		: Emergency Dike (Dike 1)			
Type of work :		: Concrete K-225			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	0+000 Area = Length = Volume =  Total Volume =	7.69 m <sup>2</sup> 25.00 m <sup>2</sup> 192.27 m <sup>3</sup>			
					
2	0+025 Area = Length = Volume =  Total Volume =	7.69 m <sup>2</sup> 25.00 m <sup>2</sup> 192.27 m <sup>3</sup>			
					
3	0+050 Area = Length = Volume =  Total Volume =	7.69 m <sup>2</sup> 25.00 m <sup>2</sup> 192.27 m <sup>3</sup>			
					
4	0+075 Area = Length = Volume =  Total Volume =	7.69 m <sup>2</sup> 25.00 m <sup>2</sup> 192.27 m <sup>3</sup>			
					

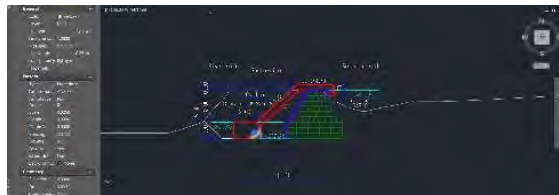
5	<b>0-100</b> Area = 7.69 m <sup>2</sup> Length = 25.00 m <sup>2</sup> Volume = 192.27 m <sup>3</sup>		192.27 m <sup>3</sup>		
6	<b>0-125</b> Area = 7.69 m <sup>2</sup> Length = 25.00 m <sup>2</sup> Volume = 192.27 m <sup>3</sup> Total Volume =		192.27 m <sup>3</sup>		
7	<b>0-150</b> Area = 7.69 m <sup>2</sup> Length = 25.00 m <sup>2</sup> Volume = 192.27 m <sup>3</sup> Total Volume =		192.27 m <sup>3</sup>		
8	<b>0-175</b> Area = 7.69 m <sup>2</sup> Length = 25.00 m <sup>2</sup> Volume = 192.27 m <sup>3</sup> Total Volume =		192.27 m <sup>3</sup>		

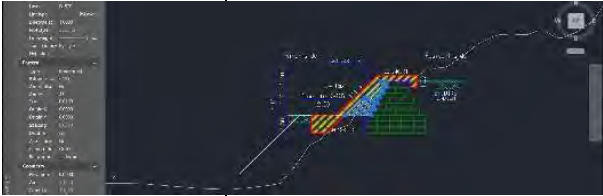
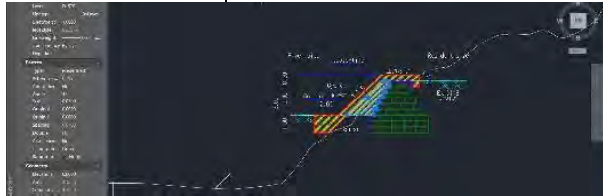
9	0+200 Area = 7.69 m <sup>2</sup> Length = 25.00 m Volume = 192.27 m <sup>3</sup> Total Volume =	192.27	m <sup>3</sup>			
						
10	0+225 Area = 7.69 m <sup>2</sup> Length = 25.00 m Volume = 192.27 m <sup>3</sup> Total Volume =	192.27	m <sup>3</sup>			
						
11	0+250 Area = 7.69 m <sup>2</sup> Length = 25.00 m Volume = 192.27 m <sup>3</sup> Total Volume =	192.27	m <sup>3</sup>			
						
12	0+263,75 Area = 7.69 m <sup>2</sup> Length = 25.00 m Volume = 192.27 m <sup>3</sup> Total Volume =	192.27	m <sup>3</sup>			
						
<b>Concrete K-225 Dike 1 Total Volume =</b>		<b>2,307.21</b>	<b>m<sup>3</sup></b>			

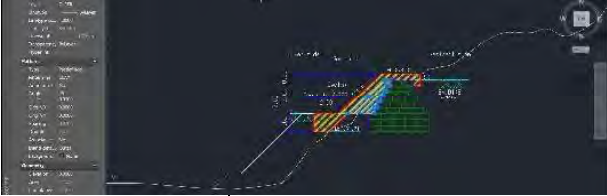
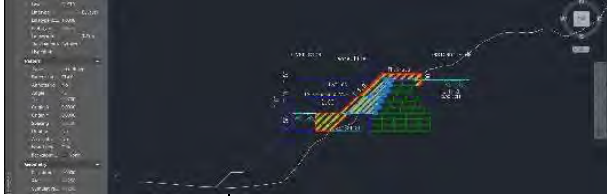
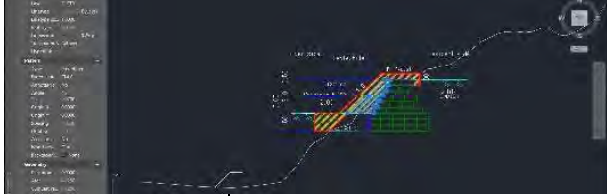

Name Structure :		: Emergency Dike (Dike 2)			
Type of work		: Concrete K-225			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	0+000 Area = Length = Volume = Total Volume =	7.69 m <sup>2</sup> 25.00 m <sup>3</sup> 192.27 m <sup>3</sup>	192.27	m <sup>3</sup>	
					
2	0+025 Area = Length = Volume = Total Volume =	7.69 m <sup>2</sup> 25.00 m <sup>3</sup> 192.27 m <sup>3</sup>	192.27	m <sup>3</sup>	
					
3	0+050 Area = Length = Volume = Total Volume =	7.69 m <sup>2</sup> 25.00 m <sup>3</sup> 192.27 m <sup>3</sup>	192.27	m <sup>3</sup>	
					
4	0+075 Area = Length = Volume = Total Volume =	7.69 m <sup>2</sup> 25.00 m <sup>3</sup> 192.27 m <sup>3</sup>	192.27	m <sup>3</sup>	
					
<b>Concrete K-225 Dike 2 Total Volume =</b>			<b>769.07</b>	<b>m<sup>3</sup></b>	

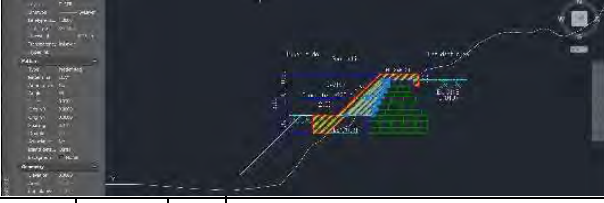
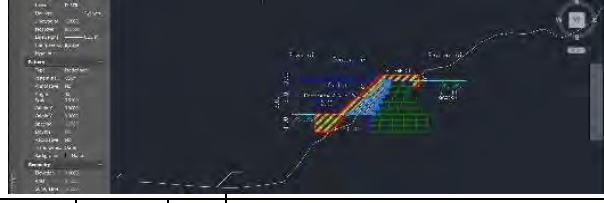
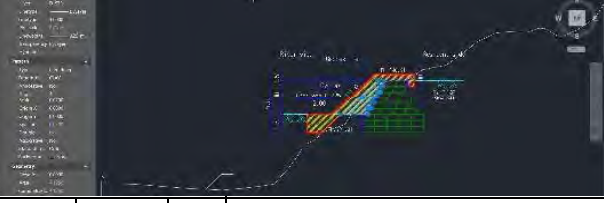
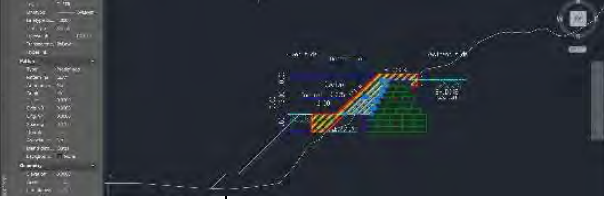
Name Structure :		: Emergency Dike (Dike 3)			
Type of work		: Concrete K-225			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	0+000 Area = Length = Volume = Total Volume =	7.69 m <sup>2</sup> 25.00 m <sup>3</sup> 192.27 m <sup>3</sup>	192.27	m <sup>3</sup>	
					
2	0+025 Area = Length = Volume = Total Volume =	7.69 m <sup>2</sup> 25.00 m <sup>3</sup> 192.27 m <sup>3</sup>	192.27	m <sup>3</sup>	
					
3	0+050 Area = Length = Volume = Total Volume =	7.69 m <sup>2</sup> 25.00 m <sup>3</sup> 192.27 m <sup>3</sup>	192.27	m <sup>3</sup>	
					
4	0+075 Area = Length = Volume = Total Volume =	7.69 m <sup>2</sup> 25.00 m <sup>3</sup> 192.27 m <sup>3</sup>	192.27	m <sup>3</sup>	
					
			<b>Concrete K-225 Dike 3 Total Volume = 769.07 m<sup>3</sup></b>		
			<b>Concrete K-225 Total Volume = 3,845.35 m<sup>3</sup></b>		

Terdapat penambahan volume akibat perubahan bentuk, penambahan volume dapat terlihat pada gambar berikut:




Name Structure :		Emergency Dike (Dike 1)			
Type of work :		Cyclops Concrete			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	0+000				
	Area =	4.13 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	103.13 m <sup>3</sup>			
	Total Volume =		103.13	m <sup>3</sup>	
					
2	0+025				
	Area =	4.13 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	103.13 m <sup>3</sup>			
	Total Volume =		103.13	m <sup>3</sup>	
					
3	0+050				
	Area =	4.13 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	103.13 m <sup>3</sup>			
	Total Volume =		103.13	m <sup>3</sup>	
					

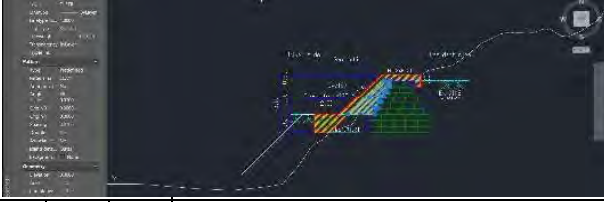
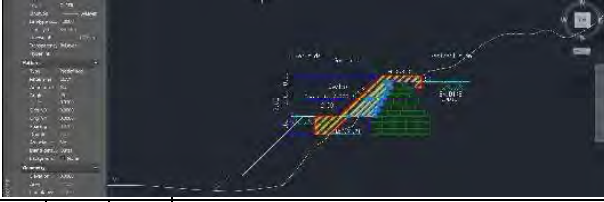
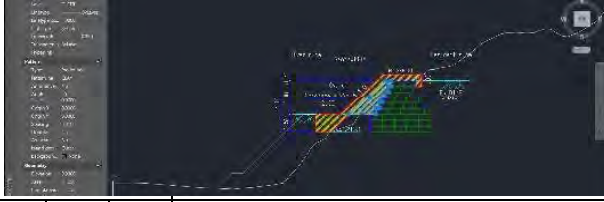
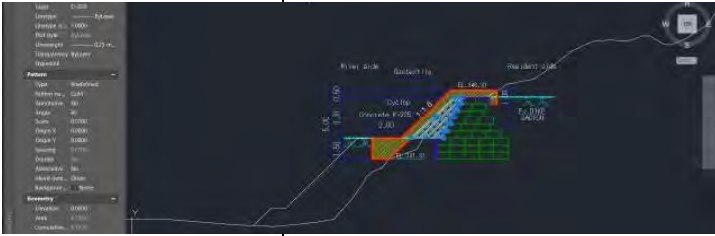
4	<b>0+075</b>					
	Area =	4.13	m <sup>2</sup>			
	Length =	25.00	m			
	Volume =	103.13	m <sup>3</sup>			
	Total Volume =			103.13	m <sup>3</sup>	
						
5	<b>0+100</b>					
	Area =	4.13	m <sup>2</sup>			
	Length =	25.00	m			
	Volume =	103.13	m <sup>3</sup>			
	Total Volume =			103.13	m <sup>3</sup>	
						
6	<b>0+125</b>					
	Area =	4.13	m <sup>2</sup>			
	Length =	25.00	m			
	Volume =	103.13	m <sup>3</sup>			
	Total Volume =			103.13	m <sup>3</sup>	
						
7	<b>0+150</b>					
	Area =	4.13	m <sup>2</sup>			
	Length =	25.00	m			
	Volume =	103.13	m <sup>3</sup>			
	Total Volume =			103.13	m <sup>3</sup>	
						

8	0+175	Area =	4.13	m <sup>2</sup>			
		Length =	25.00	m'			
		Volume =	103.13	m <sup>3</sup>			
		Total Volume =			103.13	m <sup>3</sup>	
9	0+200	Area =	4.13	m <sup>2</sup>			
		Length =	25.00	m'			
		Volume =	103.13	m <sup>3</sup>			
		Total Volume =			103.13	m <sup>3</sup>	
10	0+225	Area =	4.13	m <sup>2</sup>			
		Length =	25.00	m'			
		Volume =	103.13	m <sup>3</sup>			
		Total Volume =			103.13	m <sup>3</sup>	
11	0+250	Area =	4.13	m <sup>2</sup>			
		Length =	25.00	m'			
		Volume =	103.13	m <sup>3</sup>			
		Total Volume =			103.13	m <sup>3</sup>	

12	0+263,75				
	Area =	4.13	m <sup>2</sup>		
	Length =	25.00	m <sup>1</sup>		
	Volume =	103.13	m <sup>3</sup>		
	Total Volume =			103.13	m <sup>3</sup>

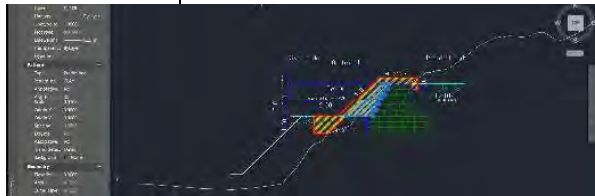
  

	
Cyclops Concrete Dike 1 Total Volume =	1,237.50 m <sup>3</sup>

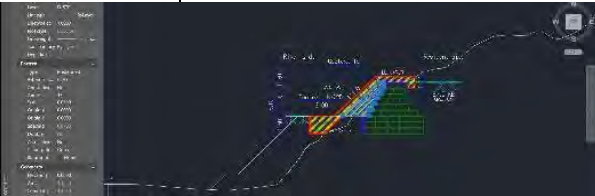
Name Structure :		: Emergency Dike (Dike 2)				
Type of work		: Cyclops Concrete				
No.	Description	Calculation	Volume	Unit	Drawing Reference	
1	0+000					
	Area =	4.13 m <sup>2</sup>				
	Length =	25.00 m'				
	Volume =	103.13 m <sup>3</sup>				
	Total Volume =		103.13	m <sup>3</sup>		
						
2	0+025					
	Area =	4.13 m <sup>2</sup>				
	Length =	25.00 m'				
	Volume =	103.13 m <sup>3</sup>				
	Total Volume =		103.13	m <sup>3</sup>		
						
3	0+050					
	Area =	4.13 m <sup>2</sup>				
	Length =	25.00 m'				
	Volume =	103.13 m <sup>3</sup>				
	Total Volume =		103.13	m <sup>3</sup>		
						
4	0+075					
	Area =	4.13 m <sup>2</sup>				
	Length =	25.00 m'				
	Volume =	103.13 m <sup>3</sup>				
	Total Volume =		103.13	m <sup>3</sup>		
						
<b>Cyclops Concrete Dike 2 Total Volume =</b>			<b>412.50</b>	<b>m<sup>3</sup></b>		

Name Structure : Emergency Dike (Dike 3)  
 Type of work : Cyclops Concrete

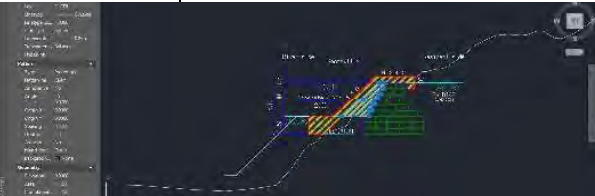
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	0+000				
	Area =	4.13 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	103.13 m <sup>3</sup>			
	Total Volume =		103.13	m <sup>3</sup>	



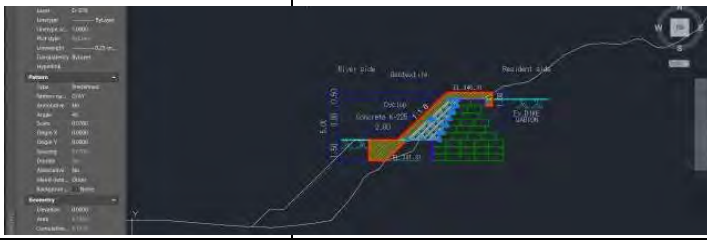
2	0+025				
	Area =	4.13 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	103.13 m <sup>3</sup>			
	Total Volume =		103.13	m <sup>3</sup>	



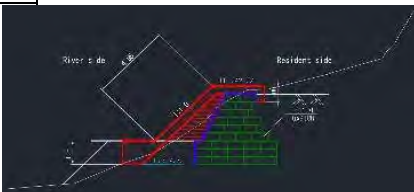
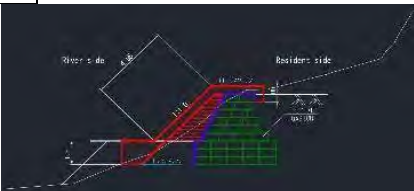
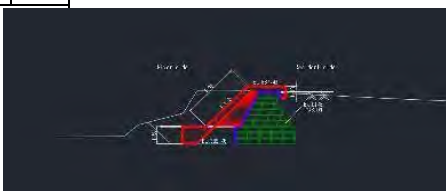
3	0+050				
	Area =	4.13 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	103.13 m <sup>3</sup>			
	Total Volume =		103.13	m <sup>3</sup>	

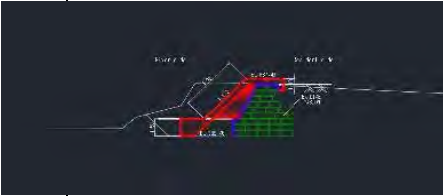
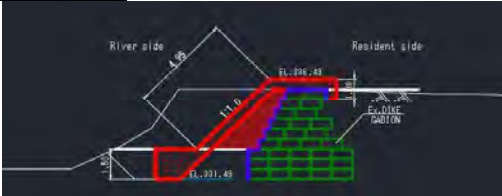
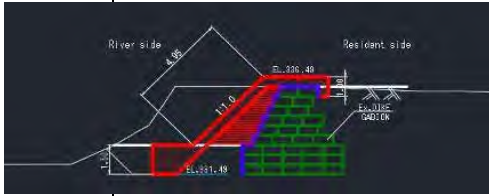
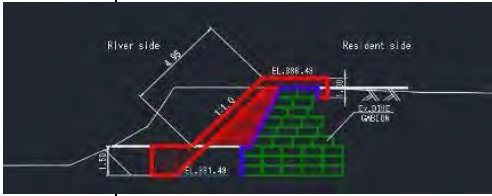


4	0+075				
	Area =	4.13 m <sup>2</sup>			
	Length =	25.00 m			
	Volume =	103.13 m <sup>3</sup>			
	Total Volume =		103.13	m <sup>3</sup>	



Cyclops Concrete Dike 2 Total Volume = 412.50 m<sup>3</sup>  
 Cyclops Concrete Total Volume = 2,062.50 m<sup>3</sup>

Name Structure :		Emergency Dike (Dike 1)			
Type of work :		Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	0+000				
	Formwork Length =	7.45 m			
	Length =	25.00 m			
	Volume =	186.25 m <sup>2</sup>			
	Total Volume =		186.25	m <sup>2</sup>	
					
2	0+025				
	Formwork Length =	7.45 m			
	Length =	25.00 m			
	Volume =	186.25 m <sup>2</sup>			
	Total Volume =		186.25	m <sup>2</sup>	
					
3	0+050				
	Formwork Length =	7.45 m			
	Length =	25.00 m			
	Volume =	186.25 m <sup>2</sup>			
	Total Volume =		186.25	m <sup>2</sup>	
					

4	0+075	Formwork Length =	7.45	m'				
		Length =	25.00	m'				
		Volume =	186.25	m2				
		Total Volume =			186.25	m2		
								
5	0+100	Formwork Length =	7.45	m'				
		Length =	25.00	m'				
		Volume =	186.25	m2				
		Total Volume =			186.25	m2		
								
6	0+125	Formwork Length =	7.45	m'				
		Length =	25.00	m'				
		Volume =	186.25	m2				
		Total Volume =			186.25	m2		
								
7	0+150	Formwork Length =	7.45	m'				
		Length =	25.00	m'				
		Volume =	186.25	m2				
		Total Volume =			186.25	m2		
								

8	0+175	Formwork Length =	7.45	m'			
		Length =	25.00	m'			
		Volume =	186.25	m2			
		Total Volume =			186.25	m2	
9	0+200	Formwork Length =	7.45	m'			
		Length =	25.00	m'			
		Volume =	186.25	m2			
		Total Volume =			186.25		m2
10	0+225	Formwork Length =	7.45	m'			
		Length =	25.00	m'			
		Volume =	186.25	m2			
		Total Volume =			186.25		m2
11	0+250	Formwork Length =	7.45	m'			
		Length =	25.00	m'			
		Volume =	186.25	m2			
		Total Volume =			186.25		m2

12	0+263,75				
	Formwork Length =	7.45	m'		
	Length =	25.00	m'		
	Volume =	186.25	m2		
	Total Volume =			186.25	m2
<b>Exposed Formwork dike 1 Total Volume =</b>				<b>2,235.00 m<sup>2</sup></b>	

Name Structure :		: Emergency Dike (Dike 2)			
Type of work		: Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	0+000				
	Formwork Length =	7.45 m'			
	Length =	25.00 m'			
	Volume =	186.25 m <sup>2</sup>			
	Total Volume =		186.25	m <sup>2</sup>	
2	0+025				
	Formwork Length =	7.45 m'			
	Length =	25.00 m'			
	Volume =	186.25 m <sup>2</sup>			
	Total Volume =		186.25	m <sup>2</sup>	
3	0+050				
	Formwork Length =	7.45 m'			
	Length =	25.00 m'			
	Volume =	186.25 m <sup>2</sup>			
	Total Volume =		186.25	m <sup>2</sup>	
4	0+075				
	Formwork Length =	7.45 m'			
	Length =	25.00 m'			
	Volume =	186.25 m <sup>2</sup>			
	Total Volume =		186.25	m <sup>2</sup>	
<b>Exposed Formwork Dike 2 Total Volume =</b>			<b>745.00</b>	<b>m<sup>2</sup></b>	

Name Structure :		Emergency Dike (Dike 3)			
Type of work :		Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	0+000				
	Formwork Length =	7.45 m'			
	Length =	25.00 m'			
	Volume =	186.25 m <sup>2</sup>			
	Total Volume =		186.25	m <sup>2</sup>	
2	0+025				
	Formwork Length =	7.45 m'			
	Length =	25.00 m'			
	Volume =	186.25 m <sup>2</sup>			
	Total Volume =		186.25	m <sup>2</sup>	
3	0+050				
	Formwork Length =	7.45 m'			
	Length =	25.00 m'			
	Volume =	186.25 m <sup>2</sup>			
	Total Volume =		186.25	m <sup>2</sup>	
4	0+075				
	Formwork Length =	7.45 m'			
	Length =	25.00 m'			
	Volume =	186.25 m <sup>2</sup>			
	Total Volume =		186.25	m <sup>2</sup>	
		Exposed Formwork Dike 3 Total Volume =	745.00	m <sup>2</sup>	
		Exposed Formwork Total Volume =	3,725.00	m <sup>2</sup>	

Name Structure :		Emergency Dike (Dike 1)			
Type of work :		Non Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	0+000				
	Formwork Length =	4.24	m'		
	Length =	25.00	m'		
	Volume =	106.07	m2		
	Total Volume =		106.07	m2	
2	0+025				
	Formwork Length =	4.24	m'		
	Length =	25.00	m'		
	Volume =	106.07	m2		
	Total Volume =		106.07	m2	
3	0+050				
	Formwork Length =	4.24	m'		
	Length =	25.00	m'		
	Volume =	106.07	m2		
	Total Volume =		106.07	m2	

4	0+075	Formwork Length =	4.24	m'				
		Length =	25.00	m'				
		Volume =	106.07	m2				
		Total Volume =			106.07	m2		
5	0+100	Formwork Length =	4.24	m'				
		Length =	25.00	m'				
		Volume =	106.07	m2				
		Total Volume =			106.07	m2		
6	0+125	Formwork Length =	4.24	m'				
		Length =	25.00	m'				
		Volume =	106.07	m2				
		Total Volume =			106.07	m2		
7	0+150	Formwork Length =	4.24	m'				
		Length =	25.00	m'				
		Volume =	106.07	m2				
		Total Volume =			106.07	m2		

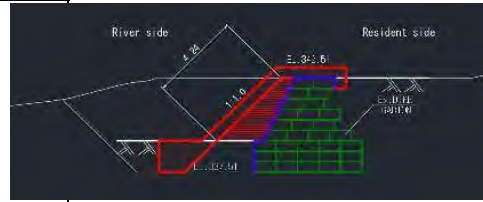
<b>8</b>	<b>0+175</b>	Formwork Length =	4.24	m'			
		Length =	25.00	m'			
		Volume =	106.07	m2			
		Total Volume =			106.07	m2	
<b>9</b>	<b>0+200</b>	Formwork Length =	4.24	m'			
		Length =	25.00	m'			
		Volume =	106.07	m2			
		Total Volume =			106.07	m2	
<b>10</b>	<b>0+225</b>	Formwork Length =	4.24	m'			
		Length =	25.00	m'			
		Volume =	106.07	m2			
		Total Volume =			106.07	m2	
<b>11</b>	<b>0+250</b>	Formwork Length =	4.24	m'			
		Length =	25.00	m'			
		Volume =	106.07	m2			
		Total Volume =			106.07	m2	

12	0+263.75				
	Formwork Length =	4.24	m'		
	Length =	25.00	m'		
	Volume =	106.07	m <sup>2</sup>		
	Total Volume =			106.07	m <sup>2</sup>
<b>Non Exposed Formwork Dike 1 Total Volume =</b>				<b>1,272.78</b>	<b>m<sup>2</sup></b>

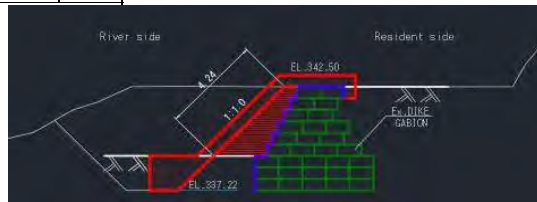
Name Structure :		: Emergency Dike (Dike 2)				
Type of work :		: Non Exposed Formwork				
No.	Description	Calculation	Volume	Unit	Drawing Reference	
1	0+000					
	Formwork Length =	4.24 m'				
	Length =	25.00 m'				
	Volume =	106.07 m <sup>2</sup>				
	Total Volume =		106.07	m <sup>2</sup>		
2	0+025					
	Formwork Length =	4.24 m'				
	Length =	25.00 m'				
	Volume =	106.07 m <sup>2</sup>				
	Total Volume =		106.07	m <sup>2</sup>		
3	0+050					
	Formwork Length =	4.24 m'				
	Length =	25.00 m'				
	Volume =	106.07 m <sup>2</sup>				
	Total Volume =		106.07	m <sup>2</sup>		
4	0+075					
	Formwork Length =	4.24 m'				
	Panjang =	25.00 m'				
	Volume =	106.07 m <sup>2</sup>				
	Total Volume =		106.07	m <sup>2</sup>		
<b>Non Exposed Formwork Dike 2 Total Volume =</b>			<b>424.26</b>	<b>m<sup>2</sup></b>		

Name Structure : : Emergency Dike (Dike 3)  
 Type of work : : Non Exposed Formwork

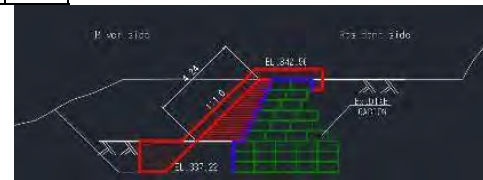
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	0+000				
	Formwork Length =	4.24 m <sup>2</sup>			
	Length =	25.00 m <sup>2</sup>			
	Volume =	106.07 m <sup>3</sup>			
	Total Volume =		106.07	m2	



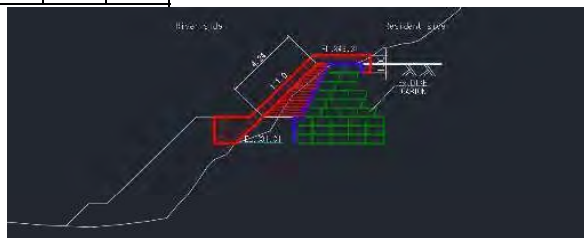
2	0+025				
	Formwork Length =	4.24 m <sup>2</sup>			
	Length =	25.00 m <sup>2</sup>			
	Volume =	106.07 m <sup>3</sup>			
	Total Volume =		106.07	m2	



3	0+050				
	Formwork Length =	4.24 m <sup>2</sup>			
	Length =	25.00 m <sup>2</sup>			
	Volume =	106.07 m <sup>3</sup>			
	Total Volume =		106.07	m2	



4	0+075				
	Formwork Length =	4.24 m <sup>2</sup>			
	Length =	25.00 m <sup>2</sup>			
	Volume =	106.07 m <sup>3</sup>			
	Total Volume =		106.07	m2	



Non Exposed Formwork Dike 3 Total Volume =			424.26	m <sup>2</sup>	
Non Exposed Formwork Total Volume =			2,121.30	m <sup>2</sup>	



卷末資料 6-2-1 積算 (S2)



**MINISTRY OF PUBLIC WORKS AND HOUSING  
DIRECTORATE GENERAL OF WATER RESOURCES  
DIRECTORATE OF RIVER AND COAST  
RIVER BASIN ORGANIZATION FOR BRANTAS**

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**THE PROJECT FOR  
CAPACITY DEVELOPMENT OF MT. SEMERU  
VOLCANIC DISASTER MEASURES PLANNING**

**SUB-PROJECT PACKAGE S2  
CD KOBOKAN 5, CD PELINTAS CURAH LENGKONG 2,  
TANGGUL CURAH LENGKONG**

**DRAFT  
ENGINEERING ESTIMATE**

**JICA Project Team**

*August 2024*

**SUMMARY OF  
ENGINEERING ESTIMATE COST**

BALAI BESAR : BALAI BESAR WILAYAH SUNGAI BRANTAS  
 SATUAN KERJA : PELAKSANAAN JARINGAN SUMBER AIR BRANTAS  
 PPK : SUNGAI DAN PANTAI I  
 PEKERJAAN : VOLCANIC DISASTER RISK REDUCTION SECTOR LOAN PROJECT - PACKAGE S2  
 LOKASI PEKERJAAN : KABUPATEN LUMAJANG  
 TAHUN ANGGARAN : 2024-2026

NO.	WORK ITEMS	TOTAL PRICE (Rp.)	BOBOT (%)
I	PREPARATION WORK	1.536.358.000	0,64
II	IMPLEMENTATION OF CONSTRUCTION SAFETY MANAGEMENT SYSTEM (SMKK)	1.805.747.000	0,75
III	CURAH LENGKONG DIKE WORKS	28.906.820.513	12,03
IV	CD PELINTAS CURAH LENGKONG 2 WORKS	27.343.402.705	11,38
V	CD KOBOKAN 5 WORKS	180.617.921.176	75,19
	Sub Total (Construction Cost)	240.210.249.393	100,00
	Rounded corners right	240.210.200.000	



**ENGINEERING ESTIMATE COST**  
**VOLCANIC DISASTER RISK REDUCTION SECTOR LOAN PROJECT - PACKAGE S2**

ANALYSIS CODE	NO.	WORK ITEM	UNIT	QUANTITY	UNIT PRICE (Rp.)	TOTAL PRICE (Rp.)	SUB TOTAL PRICE (Rp.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>I PREPARATION WORK</b>							<b>1.536.358.000</b>
A.01	1	Mobilization and Demobilization of Construction Equipment	Ls	1,00	826.000.000	826.000.000	
A.02	2	Project Facilities (Board of Directors)	Ls	1,00	710.358.000	710.358.000	
<b>SUB TOTAL PREPARATION WORK</b>							<b>1.536.358.000</b>
<b>II IMPLEMENTATION OF CONSTRUCTION SAFETY MANAGEMENT SYSTEM (SMKK)</b>							<b>1.805.747.000</b>
B.01	1	Implementation of Construction Safety Management System (SMKK)	Ls	1,00	1.805.747.000	1.805.747.000	
<b>III CURAH LENGKONG DIKE WORKS</b>							<b>28.906.820.513</b>
<b>A EARTHWORKS</b>							<b>802.987.722</b>
E.01	1	Bowplank Installation	m'	1.800,00	63.330	113.994.000	
E.02	2	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	17.922,39	20.740	371.710.369	
E.03	3	1 m Excavation Cross Profile	m	261,00	26.120	6.817.320	
E.05	4	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	36.785,08	8.440	310.466.033	
<b>B CONCRETE WORK</b>							<b>28.103.832.791</b>
F.05	1	Concrete Making and Casting fc' = 10 Mpa (K 125) Mechanical Transported radius 2000 m	m3	380,00	986.860	375.006.800	
F.20	2	Geotextile, Medium thickness (> 400 to < 800 gr), Manual	m2	15.300,00	38.590	590.427.000	
F.14	3	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	5.814,00	95.770	556.806.780	
F.08	4	Cyclops Concrete 60% Concrete fc' 15 Mpa. 40% Split Stone	m3	8.560,45	828.710	7.094.130.520	
F.17	5	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	5.814,00	4.460	25.930.440	
F.13	6	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	19.969,00	143.250	2.860.559.250	
F.15	7	1 m2 Scaffolding / Supporting Formwork Rafter 5/7 for Concrete Walls Tm 2,50 m	m2	25.783,00	96.260	2.481.871.580	
F.03	8	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanical Transported radius 2000 m	m3	12.599,85	1.109.990	13.985.707.502	
F.16	9	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	19.969,00	6.680	133.392.920	
<b>Sub Total CURAH LENGKONG DIKE WORKS</b>							<b>28.906.820.513</b>
<b>IV CD PELINTAS CURAH LENGKONG 2 WORKS</b>							<b>27.343.402.705</b>
<b>A RIVER WATERING &amp; DEWATERING WORK</b>							<b>37.829.860</b>
E.06	1	Backfill Sand (Material from Excavation, Mechanically)	m3	43,50	16.360	711.660	
C.01	2	1 Piece of Sand Geobag Size 145 x 240 cm	Buah	70,00	468.500	32.795.000	
C.02	3	Hourly operation of a 5 KW diesel water pump with a maximum suction head of 3 m and a maximum discharge head of 10 m (capacity 10 L/s at a suction head of 1 m and a discharge head of 10 m)	Jam	70,00	61.760	4.323.200	
<b>B DEMOLITION WORKS</b>							<b>48.384.000</b>
D.01	1	Demolition with RDB. Loading of Demolition Results (Rock f > 25 cm) and Transport, (mechanically, transported to the disposal area with a distance of up to 500 m)	m3	900,00	53.760	48.384.000	
<b>C EARTHWORKS</b>							<b>1.748.608.777</b>
A.04	1	1 m Bowplank Pair	m'	384,17	63.330	24.329.549	
A.05	2	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	9.910,27	20.740	205.539.062	
A.06	3	1 m Excavation Cross Profile	m	434,00	26.120	11.336.080	
E.04	4	Mechanical Sand Excavation (transported to disposal area, distance 0 m to 500 m)	m3	72.596,47	19.520	1.417.083.028	
E.05	5	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	8.066,27	8.440	68.079.353	
E.06	6	Backfill Sand (Material from Excavation, Mechanically)	m3	1.359,52	16.360	22.241.704	

ANALYSIS CODE	NO.	WORK ITEM	UNIT	QUANTITY	UNIT PRICE (Rp.)	TOTAL PRICE (Rp.)	SUB TOTAL PRICE (Rp.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>D CONCRETE WORK</b>							<b>23,740,650,153</b>
F.14	1	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	5,807,82	95,770	556,214,999	
F.07	2	Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Split Stone, with Concrete Pump (CP)	m3	12,507,18	842,630	10,538,927,544	
F.17	3	Dismante 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	5,807,82	4,460	25,902,881	
F.09	4	1 kg Slab reinforcement for BjTP or BjTS diameter > 12 mm Semi-Mechanical method	Kg	44,459,74	15,100	671,342,074	
F.13	5	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	6,599,37	143,250	945,359,390	
F.15	6	1 m2 Scaffolding / Supporting Formwork Rafter 5/7 for Concrete Walls Tm 2.50 m	m2	12,407,19	96,260	1,194,315,944	
F.01	7	Concrete Making and Casting fc' = 30 Mpa (K 350) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	4,313,48	1,289,590	5,562,621,963	
F.19	8	Construction Joint Filler	m3	42,06	81,370	3,422,702	
F.02	9	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	3,222,44	1,302,880	4,198,458,881	
F.16	10	Carefully dismanite 1 m2 of Formwork and Scaffolding	m2	6,599,37	6,680	44,083,775	
<b>E MAINTENANCE WORK &amp; FINISHING</b>							<b>970,462,416</b>
G.01	1	Irregular Riprap, Less Dense-Many Cavities, Height Difference 0-1 m & Mechanical Tidying	m3	2,909,06	333,600	970,462,416	
<b>F OTHER WORKS</b>							<b>24,531,080</b>
H.01	1	Weep Hole	m	553,00	44,360	24,531,080	
<b>G CD PELINTAS CURAH LENGKONG 2 ACCESS ROAD, L = 95,00 m</b>							<b>772,936,420</b>
E.05	1	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	3,090,04	8,440	26,079,917	
E.06	2	Backfill Sand (Material from Excavation, Mechanically)	m3	371,74	16,360	6,081,666	
F.10	3	1 m2 Exposed Formwork for Concrete Floor Slabs with Multiflex 18 mm (TP), JaTm 0.60 m	m2	114,00	127,830	14,572,620	
H.02	4	Dowel Bar	buah	304,00	58,960	17,923,840	
F.12	5	1 m2 Concrete Floor Formwork Scaffolding with 5/7 cm Rafter 4.00 m high, JaTm 0.60 m	m2	114,00	117,400	13,383,600	
F.03	6	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanically Transported radius 2000 m	m3	475,00	1,109,990	527,245,250	
F.16	7	Carefully dismanite 1 m2 of Formwork and Scaffolding	m2	114,00	6,680	761,520	
F.19	8	Construction Joint Filler	m3	1,19	81,370	96,627	
H.03	9	Box Culvert 100 x 100 x 120 cm	Buah	18,00	4,519,670	81,354,060	
H.04	10	U-Ditch 50 x 60 x 120 cm	Buah	80,00	982,920	78,633,600	
H.05	11	Guidepost	Buah	47,00	144,760	6,803,720	
<b>Sub Total CD PELINTAS CURAH LENGKONG 2 WORKS</b>							<b>27,343,402,705</b>
<b>V CD KOBOKAN 5 WORKS</b>							<b>180,617,921,176</b>
<b>A RIVER WATERING &amp; DEWATERING WORK</b>							<b>956,364,475</b>
A.04	1	1 m Bouwplank Pair	m'	795,83	63,330	50,399,914	
A.05	2	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	27,839,96	20,740	577,400,841	
A.06	3	1 m Excavation Cross Profile	m	1,713,00	26,120	44,743,560	
E.06	4	Backfill Sand (Material from Excavation, Mechanically)	m3	4,176,00	16,360	68,319,360	
C.01	5	1 Piece of Sand Geobag Size 145 x 240 cm	Buah	400,00	468,500	187,400,000	
C.02	6	Hourly operation of a 5 KW diesel water pump with a maximum suction head of 3 m and a maximum discharge head of 10 m (capacity 10 L/s at a suction head of 1 m and a discharge head of 10 m)	Jam	455,00	61,760	28,100,800	
<b>B DEMOLITION WORKS</b>							<b>155,620,330</b>
D.01	1	Demolition with RDB, Loading of Demolition Results (Rock f > 25 cm) and Transport, (mechanically, transported to the disposal area with a distance of up to 500 m)	m3	2,894,72	53,760	155,620,330	
<b>C EARTHWORKS</b>							<b>5,380,643,590</b>
E.04	1	Mechanical Sand Excavation (transported to disposal area, distance 0 m to 500 m)	m3	245,460,98	19,520	4,791,398,338	
E.05	2	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	27,273,44	8,440	230,187,853	
E.06	3	Backfill Sand (Material from Excavation, Mechanically)	m3	21,947,27	16,360	359,057,399	

ANALYSIS CODE	NO.	WORK ITEM	UNIT	QUANTITY	UNIT PRICE (Rp.)	TOTAL PRICE (Rp.)	SUB TOTAL PRICE (Rp.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>D CONCRETE WORK</b>							<b>166,177,329,786</b>
F.14	1	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	17,172,96	95,770	1,644,653,948	
F.07	2	Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Split Stone, with Concrete Pump (CP)	m3	106,647,96	842,630	89,864,772,077	
F.17	3	Dismante 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	17,172,96	4,460	76,591,382	
F.09	4	1 kg Slab reinforcement for BjTP or BjTS diameter > 12 mm Semi-Mechanical method	Kg	155,195,04	15,100	2,343,445,104	
F.13	5	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	26,124,90	143,250	3,742,391,681	
F.15	6	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2,50 m	m2	43,297,85	96,260	4,167,851,407	
F.01	7	Concrete Making and Casting fc' = 30 Mpa (K 350) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	32,746,75	1,289,590	42,229,883,371	
F.19	8	Construction Joint Filler	m3	134,86	81,370	10,973,622	
F.02	9	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	16,826,00	1,302,880	21,922,252,874	
F.16	10	Carefully dismanite 1 m2 of Formwork and Scaffolding	m2	26,124,90	6,680	174,514,321	
<b>E MAINTENANCE WORK &amp; FINISHING</b>							<b>775,080,180</b>
G.01	1	Irregular Riprap, Less Dense-Many Cavities, Height Difference 0-1 m & Mechanical Tidying	m3	2,323,38	333,600	775,080,180	
<b>F OTHER WORKS</b>							<b>58,067,240</b>
H.01	1	Weep Hole	m	1,309,00	44,360	58,067,240	
<b>G CD KOBOKAN 5 ACCESS ROAD, L = 175,00 m</b>							<b>6,162,925,265</b>
E.05	1	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	2,866,69	8,440	24,194,868	
E.06	2	Backfill Sand (Material from Excavation, Mechanically)	m3	8,193,75	16,360	134,049,750	
F.10	3	1 m2 Exposed Formwork for Concrete Floor Slabs with Multiflex 18 mm (TP), JaTm 0,60 m	m2	210,00	127,830	26,844,300	
H.02	4	Dowel Bar	buah	560,00	58,960	33,017,600	
F.12	5	1 m2 Concrete Floor Formwork Scaffolding with 5/7 cm Rafters 4,00 m high, JaTm 0,60 m	m2	210,00	117,400	24,654,000	
F.03	6	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanically Transported radius 2000 m	m3	875,00	1,109,990	971,241,250	
F.16	7	Carefully dismanite 1 m2 of Formwork and Scaffolding	m2	3,279,27	6,680	21,905,524	
F.19	8	Construction Joint Filler	m3	2,19	81,370	177,997	
H.03	9	Box Culvert 100 x 100 x 120 cm	Buah	13,00	4,519,670	58,755,710	
H.04	10	U-Ditch 50 x 60 x 120 cm	Buah	145,00	982,920	142,523,400	
H.05	11	Guidepost	Buah	87,00	144,760	12,594,120	
F.08	12	Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Split Stone	m3	4,800,05	828,710	3,977,845,889	
F.13	13	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	3,069,27	143,250	439,672,928	
F.15	14	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2,50 m	m2	3,069,27	96,260	295,447,930	
<b>H CD PELINTAS CURAH LENGKONG 2 TO CD KOBOKAN 5 ACCESS ROAD, L = 230,00 m</b>							<b>951,890,310</b>
E.05	1	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	20,531,14	8,440	173,282,801	
E.06	2	Backfill Sand (Material from Excavation,	m3	2,482,24	16,360	40,609,365	
H.03	3	Box Culvert 100 x 100 x 120 cm	Buah	35,00	4,519,670	158,188,450	
H.04	4	U-Ditch 50 x 60 x 120 cm	Buah	200,00	982,920	196,584,000	
H.05	5	Guidepost	Buah	115,00	144,760	16,647,400	
F.08	6	Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Split Stone	m3	384,24	828,710	318,423,530	
F.13	7	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	195,60	143,250	28,019,700	
F.15	8	1 m2 Scaffolding / Supporting Formwork Rafters 5/7	m2	195,60	96,260	18,828,456	
F.16	9	Carefully dismanite 1 m2 of Formwork and	m2	195,60	6,680	1,306,608	
<b>Sub Total CD KOBOKAN 5 WORKS</b>							<b>180,617,921,176</b>
<b>SUB TOTALCONSTRUCTION COST</b>							<b>240,210,249,393</b>

**SUMMARY OF WORK ANALYSIS OF UNIT PRICE  
( A H S P )**

No. Analisis	Uraian Pekerjaan	Satuan	Harga Satuan (Rp.)	Nomor Permen
<b>A</b>	<b>PEKERJAAN PERSIAPAN</b>			
A.01	Mobilization and Demobilization of Construction Equipment	Ls	826.000.000	
A.02	Project Facilities (Board of Directors)	Ls	710.358.000	U.1.3.b
A.03	Pembuatan Direksi Keet (Kantor)	m2	3.351.790	1.1.2.4
A.04	1 m Bowplank Pair	m'	63.330	U.1.2.1.d (a)
A.05	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	20.740	U.1.2.1. a. (a)
A.06	1 m Excavation Cross Profile	m	26.120	U.1.2.1.b (a)
<b>B</b>	<b>IMPLEMENTATION OF CONSTRUCTION SAFETY MANAGEMENT SYSTEM (SMKK)</b>			
B.01	Implementation of Construction Safety Management System (SMKK)	Ls	1.805.747.000	
<b>C</b>	<b>RIVER WATERING &amp; DEWATERING WORK</b>			
C.01	1 Piece of Sand Geobag Size 145 x 240 cm	Buah	468.500	U.2.1.c (a)
C.02	Hourly operation of a 5 KW diesel water pump with a maximum suction head of 3 m and a maximum discharge head of 3 m	Jam	61.760	U.2.2.b (a)
<b>D</b>	<b>DEMOLITION WORKS</b>			
D.01	Demolition with RDB, Loading of Demolition Results (Rock f > 25 cm) and Transport, (mechanically, transported to the disposal area with a distance of up to 500 m)	m3	53.760	ANTEK
<b>E</b>	<b>EARTHWORKS</b>			
E.01	Bowplank Installation	m'	63.330	U.1.2.1.d (a)
E.02	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	20.740	U.1.2.1. a. (a)
E.03	1 m Excavation Cross Profile	m	26.120	U.1.2.1.b (a)
E.04	Mechanical Sand Excavation (transported to disposal area, distance 0 m to 500 m)	m3	19.520	ANTEK
E.05	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	8.440	ANTEK
E.06	Backfill Sand (Material from Excavation, Mechanically)	m3	16.360	ANTEK
<b>F</b>	<b>CONCRETE WORK</b>			
F.01	Concrete Making and Casting f'c' = 30 Mpa (K 350) Mechanically Transported within a radius of 2000 m	m3	1.289.590	ANTEK
F.02	Concrete Making and Casting f'c' = 20 Mpa (K 225) Mechanically Transported within a radius of 2000 m	m3	1.123.910	ANTEK
F.03	Concrete Making and Casting f'c' = 20 Mpa (K 225) Mechanical Transported radius 2000 m	m3	1.109.990	ANTEK
F.04	Concrete Making and Casting f'c' = 15 Mpa (K 175) Mechanically Transported within a radius of 2000 m	m3	1.060.070	ANTEK
F.05	Concrete Making and Casting f'c' = 10 Mpa (K 125) Mechanical Transported radius 2000 m	m3	986.860	ANTEK
F.06	Manufacturing and Casting of 1 m3 of low quality concrete f'c' = 10 Mpa; W/C = 0.700 Semi Mechanical	m3	1.006.260	A.3.04.1
F.07	Cyclops Concrete 60% Concrete f'c' 15 Mpa; 40% Split Stone, with Concrete Pump (CP)	m3	842.630	ANTEK
F.08	Cyclops Concrete 60% Concrete f'c' 15 Mpa; 40% Split Stone	m3	828.710	U.4.9.c
F.09	1 kg Slab reinforcement for BJTP or BJTS diameter > 12 mm Semi-Mechanical method	Kg	15.100	U.4.6.a.2 (a)
F.10	1 m2 Exposed Formwork for Concrete Floor Slabs with Multiflex 18 mm (TP), JaTm 0.60 m	m2	127.830	A.1.03.2b.2
F.11	1 m2 Regular Concrete Floor Formwork with Multiflex 12 mm or 18 mm (TP)	m2	88.660	A.1.03.2b.1
F.12	1 m2 Concrete Floor Formwork Scaffolding with 5/7 cm Rafters 4.00 m high, JaTm 0.60 m	m2	117.400	A.1.03.2b.4
F.13	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	143.250	A.1.03.2f.2
F.14	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	95.770	A.1.03.2f.1
F.15	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	96.260	A.1.03.2f.4
F.16	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	6.680	A.1.03.2i.2
F.17	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Exposed	m2	4.460	A.1.03.2i.1
F.18	Construction Joint Sealant	m3	37.480	A.2.02.5d.3
F.19	Construction Joint Filler	m3	81.370	A.2.02.5d.1
F.20	Geotextile, Medium thickness (> 400 to < 800 gr), Manual	m2	38.590	A.1.02.5b.2
<b>G</b>	<b>MAINTENANCE WORK &amp; FINISHING</b>			
G.01	Irregular Riprap, Less Dense-Many Cavities, Height Difference 0-1 m & Mechanical Tidying	m3	333.600	A.1.02.4a.2.b
G.02	Anstamping for building construction	m3	515.790	2.2.2.1.1
G.03	Painting 2 m2 of new wall (1 layer of plaster, 1 layer of base coat, 2 layers of top coat)	0	38.590	A.1.02.3b.13
		m2	43.800	3.8.10
<b>H</b>	<b>OTHER WORKS</b>			
H.01	Weep Hole	m	44.360	A.2.02.5d.3
H.02	Dowel Bar	buah	58.960	1.29
H.03	Box Culvert 100 x 100 x 120 cm	Buah	4.519.670	A.3.09.2b.3.b
H.04	U-Ditch 50 x 60 x 120 cm	Buah	982.920	A.3.09.2a.1.b
H.05	Guidepost	Buah	144.760	O.30

**AHSP menggunakan :  
Permen PUPR No 8 tahun 2023**

1	<b>Jam kerja efektif dalam 1 hari</b>	7,00	jam
2	<b>Jam kerja efektif dalam 1 bulan</b>	25,00	hari
3	<b>Asuransi, Pajak, dsb. untuk Peralatan</b>	0,20	% x Harga Pokok Alat
4	<b>Suku bunga (i)</b>	11,00	%
5	<b>Biaya Umum dan Keuntungan (over head &amp; profit)</b>	10,00	%
6	<b>Kurs</b>	07-May-24	
	<b>1 U\$</b>	Rp16.075,00	
	<b>1 zak semen</b>	50,00	kg

**Perubahan Permen no 28 tahun 2016 - Permen no 1 tahun 2022**  
analisa alat                      biaya operasi per jam  
koef pekerjaan

DAFTAR STANDAR HARGA SATUAN DASAR (SHSD)				
UPAH KERJA				
No.	Tenaga Kerja	Kode	Satuan	Upah Kerja
				(Rp)
1.	Pekerja	L. 01	orang/hari	91.259
2.	Tukang	L. 02	orang/hari	91.259
3.	Tukang Batu	L. 03	orang/hari	91.259
4.	Tukang Besi	L. 04	orang/hari	91.259
5.	Tukang Beton	L. 05	orang/hari	91.259
6.	Tukang Cat	L. 06	orang/hari	91.259
7.	Tukang Kayu	L. 07	orang/hari	91.259
8.	Kepala Tukang	L. 8	orang/hari	95.000
9.	Kepala Tukang Batu	L. 9	orang/hari	95.000
10.	Kepala Tukang Besi	L. 10	orang/hari	95.000
11.	Kepala Tukang Cat	L. 11	orang/hari	95.000
12.	Kepala Tukang Kayu	L. 12	orang/hari	95.000
13.	Mandor	L. 13	orang/hari	100.000
14.	Operator	L. 14	orang/hari	91.259
15.	Operator Alat Berat	L. 15	orang/hari	100.000
16.	Operator Pompa	L. 16	orang/hari	100.000
17.	Assisten Operator	L. 17	orang/hari	91.259
18.	Sopir	L. 18	orang/hari	100.000

DAFTAR STANDAR HARGA SATUAN DASAR (SHSD)				
BAHAN BANGUNAN				
No.	Jenis Bahan/Material	Kode	Satuan	Harga Satuan
				(Rp)
1.	Air	M. 01	liter	50
2.	Ampelas/kertas gosok	M. 2	lembar	1.700
3.	APAR (Alat Pemadam Api Ringan)	M. 3	Buah	537.500
4.	Asbes Gelombang	M. 4	lembar	101.000
5.	Bahan Bakar Pertalite (non subsidi)	M. 5	liter	10.000
6.	Bahan Bakar Solar (industri)	M. 6	liter	21.100
7.	Batu Belah	M. 7	m <sup>3</sup>	240.000
8.	Batu Kali	M. 8	m <sup>3</sup>	240.000
9.	Benang Jahit Geotekstil	M. 9	m	12.000
10.	Bendera K3 (Safety Flag)	M. 10	Buah	58.900
11.	Besi Beton Polos	M. 11	kg	11.950
12.	Besi Beton Ulir	M. 12	kg	13.000
13.	Besi Dowel	M. 13	Kg	11.950
14.	Box Culvert 100.100.120	M. 14	Buah	3.584.892
15.	Cat Dinding/Plafon	M. 15	kg	86.000
16.	Cat Tembok Dasar	M. 16	kg	27.000
17.	Cat Tembok Penutup	M. 17	kg	86.000
18.	CCTV Outdoor	M. 18	Unit	1.399.000
19.	Concrete Additive	M. 19	kg	31.000
20.	Frame besi kaca nako	M. 20	daun	550.000
21.	Geotextile Non Woven 200gr	M. 21	m <sup>2</sup>	12.500
22.	Geotextile Non Woven 500gr	M. 22	m <sup>2</sup>	29.100
23.	GRC 6 mm	M. 23	lembar	154.500
24.	Helim Pelindung (Safety Helmet)	M. 24	Buah	51.500
25.	Ijuk	M. 25	kg	13.390
26.	Jaring Pengaman (Safety Net)	M. 26	m	6.130
27.	Jas Hujan (Raincoat)	M. 27	Set	242.000
28.	Joint filler, t = 20 mm	M. 28	m <sup>3</sup>	65.900
29.	Joint sealant	M. 29	kg	33.480

30.	Kaca Bening 5 mm	M. 30	m <sup>2</sup>	221.450
31.	Kaso 4/6 cm	M. 31	m <sup>2</sup>	2.811.900
32.	Kaso 5/7 cm	M. 32	m <sup>3</sup>	2.811.900
33.	Kawat Ikat Beton (Bendrat)	M. 33	kg	21.000
34.	Kayu Dolken	M. 34	batang	29.820
35.	Kerikil Beton	M. 35	m <sup>3</sup>	290.000
36.	Kerucut Lalu Lintas (Rubber Cone)	M. 36	Buah	36.050
37.	Minyak bekisting	M. 37	liter	26.400
38.	Multipleks, 18 mm	M. 38	lembar	207.300
39.	Paku 1 cm - 2,5 cm	M. 39	kg	20.000
40.	Paku 5 cm dan 7 cm	M. 40	kg	20.000
41.	Paku Asbes	M. 41	kg	38.000
42.	Paku Biasa	M. 42	kg	28.000
43.	Paku Payung	M. 43	Buah	6.500
44.	Papan Informasi K3	M. 44	Buah	1.988.600
45.	Papan kayu bekisting	M. 45	m <sup>3</sup>	2.686.000
46.	Papan Kayu Kelas III	M. 46	m <sup>2</sup>	2.595.600
47.	Pasir Beton	M. 47	m <sup>3</sup>	200.000
48.	Pasir Pasang	M. 48	m <sup>3</sup>	200.000
49.	Pasir Urug	M. 49	m <sup>3</sup>	160.000
50.	Pelat Rambu	M. 50	Buah	
51.	Pelindung Jatuh (Fall Arrester)	M. 51	Set	616.000
52.	Pelindung Mata (Goggles, Spectacles)	M. 52	Set	206.000
53.	Pelindung Pernapasan dan Mulut (Masker)	M. 53	Buah	51.500
54.	Pelindung Telinga (Ear Plus, Ear Nuff)	M. 54	Set	51.500
55.	Pelumas	M. 55	liter	42.000
56.	Pembatas Area (Restricted Area)	M. 56	Ls	1.500.000
57.	Pintu double teakwood rangka kayu	M. 57	m <sup>2</sup>	670.000
58.	Penunjang Seluruh Tubuh (Full Body Harness)	M. 58	Buah	103.000
59.	Pipa PVC dia. 2"	M. 59	m'	22.285
60.	Pompa Air Diesel 5 kW, Q = 10 l/s	M. 60	Unit	2.250.000
61.	Poster Proyek	M. 61	Lembar	37.000
62.	Profil kaca	M. 62	m'	75.000
63.	Rambu Informasi	M. 63	Buah	128.750
64.	Rambu Jalur Evakuasi	M. 64	Buah	128.750
65.	Rambu Kewajiban	M. 65	Buah	128.750
66.	Rambu Larangan	M. 66	Buah	128.750
67.	Rambu Pekerjaan Sementara	M. 67	Buah	128.750
68.	Rambu Peringatan	M. 68	Buah	128.750
69.	Rambu Petunjuk	M. 69	Buah	128.750
70.	Rompi Keselamatan (Safety Vest)	M. 70	Buah	154.500
71.	Sarung Tangan (Safety Gloves)	M. 71	Set	5.150
72.	Semen Grouting (Epoxy)	M. 72	liter	38.000
73.	Semen Portland	M. 73	kg	1.523
74.	Semen Portland 50 kg	M. 74	zak	82.000
75.	Seng gelombang	M. 75	lembar	80.000
76.	Sepatu Keselamatan (Safety Shoes)	M. 76	set	257.500
77.	Sewa Lahan	M. 77	Ha - Bulan	1.333.333
78.	Sewa pasir	M. 78	m3	56.000
79.	Sirine	M. 79	Set	361.000
80.	Sirtu	M. 80	m3	175.000
81.	Spanduk / Banner Proyek	M. 81	Lembar	121.000
82.	Tali Keselamatan (Life Line)	M. 82	m	31.056
83.	Tali rafia/plastik	M. 83	m	60
84.	Tanah Timbunan/urug	M. 84	m <sup>3</sup>	160.000
85.	Tongkat Pengatur Lalu Lintas (Warning Light)	M. 85	Buah	57.000
86.	Triplek, tebal 4 mm	M. 86	lembar	76.100
87.	U-Ditch 50 x 60 x 120, t = 6,00 cm	M. 87	Buah	856.509

DAFTAR STANDAR HARGA SATUAN DASAR (SHSD)				
PENGUNAAN PERALATAN KONSTRUKSI PER JAM				
No.	Jenis Bahan/Material	Kode	Satuan	Harga Satuan (Rp)
1.	Agitator Truck, 8 m3	E. 01	jam	1.096.000
2.	Batching Plant, 60 m3/jam	E. 02	jam	1.019.600
3.	Bor Listrik (Portable) 300 Watt	E. 03	jam	27.300
4.	Concrete Pump Trailer, 60 m3/jam	E. 04	jam	630.300
5.	Concrete Vibrator	E. 05	jam	54.000
6.	Crane Truck Hydraulic	E. 06	jam	618.800
7.	Drilling Machine 3.32 HP, (Dia. 20-50 mm)	E. 07	jam	38.000
8.	Dump Truck, 7 ton	E. 08	jam	398.300
9.	Excavator, 150-135 HP	E. 09	jam	897.200
10.	Excavator Breaker	E. 010	jam	743.200
11.	Grouting Pump 0,50-1,5 m3/jam, 25 Bar	E. 11	jam	34.200
12.	Diesel Generator, 2 kVA	E. 12	jam	36.200
13.	Mesin Jahit Geotekstil	E. 13	jam	28.200
14.	bar bender	E. 14	Hari	70.000
15.	bar cutter	E. 15	Hari	70.000
16.	Mesin Stamper	E. 16	jam	46.200
17.	Molen, 0.35 m3	E. 17	jam	42.200
18.	Pemotong Kain / Geotekstil	E. 18	jam	27.300
19.	Pompa Air	E. 19	jam	91.000
20.	Tackle / Tripod	E. 20	jam	200.000
21.	Theodolite Digital	E. 21	hari	350.000
22.	Waterpass Digital	E. 22	hari	200.000
23.	Wheel Loader, 1.0-1.6 m3	E. 23	jam	491.000
24.	Alat Bantu	E. 24	jam	1.000
25.	Linggis	E. 25	buah	90.000
26.	Palu Batu (Godam)	E. 26	buah	37.000
27.	Pahat Beton	E. 27	buah	25.000



### DAFTAR HARGA ALAT BERAT BARU 2024

No.	Jenis Bahan/Material	Satuan	Harga Satuan (Rp)
1.	Agitator Truck, 8 m3	Buah	1.753.134.000
2.	Batching Plant, 60 m3/jam	Buah	3.396.000.000
3.	Concrete Pump Trailer, 60 m3/jam	Buah	1.637.361.000
4.	Crane Truck Hydraulic	Buah	1.780.770.000
5.	Dump Truck, 7 ton	Buah	567.138.630
6.	Excavator, 150-135 HP	Buah	2.575.200.000
7.	Excavator Breaker	Buah	2.575.200.000
8.	Pemotong Kain / Geotextile	Buah	240.000
9.	Wheel Loader, 1.0-1.6 m3	Buah	532.659.200

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : A.01  
 Macam pekerjaan : Mobilization and Demobilization of Construction Equipment  
 Kuantitas pekerjaan : 1 Ls  
 Satuan pengukuran : Ls  
 Harga Satuan : Rp 826.000.000

No.	Description	Code	Unit	Coefficient	Unit price (Rp)	Jumlah (Rp)
<b>A</b>	<b>Mobilisasi</b>					
	<i>Dengan Lowbed Trailer</i>					
1.	Excavator Standar 135-150 HP		unit	10,00	25.000.000	250.000.000
2.	Excavator Breaker		unit	1,00	25.000.000	25.000.000
3.	Batching Plant, 60 m3/jam		unit	2,00	25.000.000	50.000.000
4.	Wheel Loader		unit	2,00	25.000.000	50.000.000
	<i>Tanpa Lowbed Trailer</i>					
1.	Agitator Truck, 8 m3		unit	12,00	1.000.000	12.000.000
2.	Dump Truck, 7 ton		unit	24,00	1.000.000	24.000.000
3.	Crane Truck Hydraulic		unit	2,00	1.000.000	2.000.000
<b>B</b>	<b>Demobilisasi</b>					
	<i>Dengan Lowbed Trailer</i>					
1.	Excavator Standar 135-150 HP		unit	10,00	25.000.000	250.000.000
2.	Excavator Breaker		unit	1,00	25.000.000	25.000.000
3.	Batching Plant, 60 m3/jam		unit	2,00	25.000.000	50.000.000
4.	Wheel Loader		unit	2,00	25.000.000	50.000.000
	<i>Tanpa Lowbed Trailer</i>					
1.	Agitator Truck, 8 m3		unit	12,00	1.000.000	12.000.000
2.	Dump Truck, 7 ton		unit	24,00	1.000.000	24.000.000
3.	Crane Truck Hydraulic		unit	2,00	1.000.000	2.000.000
<b>B</b>	<b>Jumlah</b>					<b>826.000.000</b>
<b>C</b>	<b>Harga Satuan Pekerjaan</b>					<b>826.000.000</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : A.02  
 Macam pekerjaan : Project Facilities (Board of Directors)  
 Kuantitas pekerjaan : 1 Ls  
 Satuan pengukuran : Ls  
 Harga Satuan : Rp 710.358.000

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah Harga (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
<b>Jumlah Harga Tenaga Kerja</b>						-
<b>B</b>	<b>Bahan Pakai habis</b>					
1.	Pembuatan Direksi Keet (Kantor)	A.03	m2	200,00	3.351.790	670.358.000
2.	Sewa Lahan	M. 77	Ha - Bulan	30,00	1.333.333	40.000.000
<b>Jumlah Harga Bahan Pakai habis</b>						<b>710.358.000</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						-
<b>D</b>	<b>Jumlah (A + B + C)</b>					710.358.000
<b>F</b>	<b>Harga Satuan Pekerjaan per - Ls (D)</b>					<b>710.358.000</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : A.03  
 Macam pekerjaan : Pembuatan Direksi Keet (Kantor)  
 Kuantitas pekerjaan : 1 m2  
 Satuan pengukuran : m2  
 Harga Satuan : Rp 3.351.790

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah Harga (Rp)
<b>A Tenaga Kerja</b>						
1.	Pekerja	L. 01	orang/hari	1,20	91.259	109.511
2.	Tukang Batu	L. 03	orang/hari	0,40	91.259	36.504
3.	Kepala Tukang Batu	L. 9	orang/hari	0,04	95.000	3.800
4.	Mandor	L. 13	orang/hari	0,12	100.000	12.000
<b>Jumlah Harga Tenaga Kerja</b>						<b>161.814</b>
<b>B Bahan</b>						
1.	Kaso 5/7 cm	M. 32	m3	0,35	2.811.900	984.165
2.	Triplek, tebal 4 mm	M. 86	lembar	1,00	76.100	76.100
3.	Pasangan batu kosong (Aanstamping)	G.02	m3	0,17	515.790	87.684
4.	GRC 6 mm	M. 23	lembar	1,24	154.500	191.580
5.	Paku biasa	M. 42	kg	0,75	28.000	21.000
6.	Asbes gelombang	M. 4	lembar	0,30	101.000	30.300
7.	Paku asbes	M. 41	kg	0,10	38.000	3.800
8.	Floor lantai (beton lantai kerja)	F.06	m3	0,15	1.006.260	150.939
9.	Pintu double teakwood rangka kayu	M. 57	m2	0,10	670.000	67.000
10.	Frame besi kaca nako	M. 20	daun	1,00	550.000	550.000
11.	Cat dinding/plafon	G.03	m2	16,50	43.800	722.700
<b>Jumlah Harga Bahan</b>						<b>2.885.268</b>
<b>C Peralatan</b>						
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D Jumlah (A + B + C)</b>						<b>3.047.082</b>
<b>E Overhead &amp; Profit (10%x D)</b>						<b>304.708</b>
<b>F Harga Satuan Pekerjaan per - m2 (D + E)</b>						<b>3.351.790</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : A.04  
 Macam pekerjaan : Sewa Lahan  
 Kuantitas pekerjaan : 1 Ls  
 Satuan pengukuran : Ls  
 Harga Satuan : Rp 40.000.000

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah Harga (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
<b>Jumlah Harga Tenaga Kerja</b>						-
<b>B</b>	<b>Bahan</b>					
<b>Jumlah Harga Bahan</b>						-
<b>C</b>	<b>Peralatan</b>					
1	Sewa Lahan	M. 77	Ha - Bulan	30,00	1.333.333	40.000.000
<b>Jumlah Harga Peralatan</b>						<b>40.000.000</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					40.000.000

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : A.04  
 Macam pekerjaan : 1 m Bouwplank Pair  
 Kuantitas pekerjaan : 1 m'  
 Satuan pengukuran : m'  
 Harga Satuan : Rp 63.330

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A Tenaga Kerja</b>						
1.	Pekerja	L. 01	orang/hari	0,012	91.259	1.095
2.	Tukang kayu	L. 07	orang/hari	0,006	91.259	548
3.	Kepala tukang	L. 8	orang/hari	0,001	95.000	57
4.	Mandor	L. 13	orang/hari	0,001	100.000	120
<b>Jumlah Harga Tenaga Kerja</b>						<b>1.820</b>
<b>B Bahan</b>						
1.	Kaso 5/7 cm	M. 32	m3	0,013	2.811.900	36.555
2.	Paku 1 cm - 2,5 cm	M. 39	kg	0,020	20.000	400
3.	Papan kayu bekisting	M. 45	m3	0,007	2.686.000	18.802
<b>Jumlah Harga Bahan</b>						<b>55.757</b>
<b>C Peralatan</b>						
1.	Waterpass Digital	E. 22	hari	0,006	200.000	1.200
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>57.576</b>
<b>E</b>	<b>Overhead &amp; Profit (10%x D)</b>					<b>5.758</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m' (D + E)</b>					<b>63.330</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : A.05  
 Macam pekerjaan : Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 20.740

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0,010	91.259	876
2.	Tukang kayu	L. 07	orang/hari	0,005	91.259	438
3.	Kepala tukang	L. 8	orang/hari	0,005	95.000	456
4.	Mandor	L. 13	orang/hari	0,001	100.000	96
<b>Jumlah Harga Tenaga Kerja</b>						<b>1.866</b>
<b>B</b>	<b>Bahan</b>					
1.	Kaso 5/7 cm	M. 32	m3	0,004	2.811.900	9.842
2.	Paku Payung	M. 43	Buah	1,100	6.500	7.150
<b>Jumlah Harga Bahan</b>						<b>16.992</b>
<b>C</b>	<b>Peralatan</b>					
1.	Waterpass Digital	E. 22	hari	0,0048	200.000	960
2.	Theodolite Digital	E. 21	hari	0,0048	350.000	1.680
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>18.858</b>
<b>E</b>	<b>Overhead &amp; Profit (10%x D)</b>					<b>1.886</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m2 (D + E)</b>					<b>20.740</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : A.06  
 Macam pekerjaan : 1 m Excavation Cross Profile  
 Kuantitas pekerjaan : 1 m  
 Satuan pengukuran : m  
 Harga Satuan : Rp 26.120

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0,007	91.259	657
2.	Tukang kayu	L. 07	orang/hari	0,004	91.259	329
3.	Kepala tukang	L. 8	orang/hari	0,000	95.000	34
4.	Mandor	L. 13	orang/hari	0,001	100.000	72
<b>Jumlah Harga Tenaga Kerja</b>						<b>1.092</b>
<b>B</b>	<b>Bahan</b>					
1.	Kaso 4/6 cm	M. 31	m3	0,003	2.811.900	7.030
2.	Papan Kayu Kelas III	M. 46	m3	0,004	2.595.600	10.902
3.	Paku 5 cm dan 7 cm	M. 40	kg	0,200	20.000	4.000
<b>Jumlah Harga Bahan</b>						<b>21.931</b>
<b>C</b>	<b>Peralatan</b>					
1.	Waterpass Digital	E. 22	hari	0,0036	200.000	720
<b>Jumlah Harga Peralatan</b>						<b>720</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>23.743</b>
<b>E</b>	<b>Overhead &amp; Profit (10%x D)</b>					<b>2.374</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m (D + E)</b>					<b>26.120</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : A.07  
 Macam pekerjaan : Patok Kayu (Kaso 5/7) Panjang 1 m  
 Kuantitas pekerjaan : 1 Buah  
 Satuan pengukuran : Buah  
 Harga Satuan : Rp 22.010

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0,012	91.259	1.095
2.	Tukang kayu	L. 07	orang/hari	0,006	91.259	548
3.	Kepala tukang	L. 8	orang/hari	0,001	95.000	57
4.	Mandor	L. 13	orang/hari	0,001	100.000	120
<b>Jumlah Harga Tenaga Kerja</b>						<b>1.820</b>
<b>B</b>	<b>Bahan</b>					
1.	Kaso 5/7 cm	M. 32	m3	0,004	2.811.900	9.842
2.	Paku Payung	M. 43	Buah	1,100	6.500	7.150
<b>Jumlah Harga Bahan</b>						<b>16.992</b>
<b>C</b>	<b>Peralatan</b>					
1.	Waterpass Digital	E. 22	hari	0,006	200.000	1.200
<b>Jumlah Harga Peralatan</b>						<b>1.200</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>20.011</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>2.001</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - Buah (D + E)</b>					<b>22.010</b>

**LAMPIRAN**  
**ANALISA HARGA SATUAN PEKERJAAN**  
**(AHSPK)**

No. : A.01 (2)  
 Jenis Pekerjaan : Mobilisasi dan Demobilisasi Peralatan Konstruksi  
 Harga Satuan : Rp 899.611.100  
 Satuan : LS

A. Mob - Demob : Surabaya - Lumajang 180 km  
 Harga Mob-Demob 25.000.000  
 Dimensi Trailer 29 m2 [Harga Vendor](#)

No.	Alat	Satuan	Volume	Keterangan dimensi Alat (m2/unit)	Jumlah Trailer	Rute	Biaya Mob-demob (Rp)	Jumlah (Rp)
<b>I</b>	<b>PERALATAN</b>							
	Menggunakan Trailer							
1.	Excavator Standar 135-150 HP	unit	10	26,60	10	2	25.000.000	500.000.000
2.	Excavator Breaker	unit	1	26,60	1	2	25.000.000	50.000.000
3.	Batching Plant, 60 m3/jam	unit	2	100,00	3	2	25.000.000	173.611.111
4.	Wheel Loader	unit	2	26,60	2	2	25.000.000	100.000.000
	Total				16			
No.	Alat	Satuan	Volume	Keterangan dimensi Alat (m2/unit)	Jumlah Trailer	Rute	Biaya Mob-demob (Rp)	Jumlah (Rp)
1.	Tanpa Menggunakan Trailer Agitator Truck, 8 m3	unit	12		-	2	1.000.000	24.000.000
2.	Dump Truck, 7 ton	unit	24		-	2	1.000.000	48.000.000
3.	Crane Truck Hydraulic	unit	2		-	2	1.000.000	4.000.000
4.	Concrete Pump	unit	5			2		-
5.	Concrete Vbator	unit	28			2		-
6.	Mesin Stampor	unit	7			2		-
7.	Pompa Air	unit	2			2		-
8.	Pemotong Besi	unit	1			2		-
9.	Pembengkok Besi	unit	1			2		-
10.	Drilling Machine	unit	1			2		-
	<b>Biaya langsung (Sub Total I)</b>							899.611.111
<b>V</b>	<b>HARGA SATUAN PEKERJAAN PEMBULATAN (Rp. / LS)</b>							<b>899.611.100</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : B.01  
 Macam pekerjaan : Implementation of Construction Safety Management System (SMKK)  
 Kuantitas pekerjaan : 1 Ls  
 Satuan pengukuran : Ls  
 Harga Satuan : Rp 1.805.747.000

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah Harga (Rp)
<b>A</b>	<b>Penyiapan Dokumen Penerapan SMKK</b>					
1.	Pembuatan Dokumen SMKK (RKK, RMPK,		Set	20,00	150.000	3.000.000
2.	Pembuatan Prosedur dan Instruksi Kerja		Set	4,00	150.000	600.000
3.	Penyusunan Laporan Penerapan SMKK (harian,		Set	4,00	150.000	600.000
<b>B</b>	<b>Sosialisasi, Promosi dan Pelatihan</b>					
1.	Induksi Keselamatan Konstruksi (Safety Induction);		Org	110,00	50.000	5.500.000
2.	Pengarahan Keselamatan Konstruksi (Safety Briefing);		Org	110,00	15.000	1.650.000
3.	Pertemuan mengenai keselamatan (Safety		Org	100,00	10.000	1.000.000
4.	Patroli keselamatan;		Durasi	288,00	200.000	57.600.000
5.	Pelatihan Keselamatan Konstruksi;					
	- P3K		Org	100,00	65.000	6.500.000
	- Bekerja di ketinggian		Org	100,00	65.000	6.500.000
	- Analisis keselamatan pekerjaan		Org	100,00	65.000	6.500.000
	- Perilaku berbasis keselamatan (Budaya K3)		Org	100,00	65.000	6.500.000
6.	Simulasi Keselamatan Konstruksi;		Org	100,00	65.000	6.500.000
7.	Spanduk / Banner Proyek		Lembar	20,00	121.000	2.420.000
8.	Poster Proyek		Lb	20,00	50.000	1.000.000
9.	Papan Informasi K3		Buah	15,00	1.988.600	29.829.000
<b>C</b>	<b>Alat Pelindung Kerja (APK) dan Alat Pelindung Diri (APD)</b>					
1.	Alat Pelindung Kerja (APK)					
	Jaring Pengaman (Safety Net)		m	300,00	6.130	1.839.000
	Tali Keselamatan (Life Line)		m	300,00	31.056	9.316.650
	Pembatas Area (Restricted Area)		Ls	1,00	1.500.000	1.500.000
	Pelindung Jatuh (Fall Arrester)		Set	30,00	616.000	18.480.000
2.	Alat Pelindung Diri (APD)					
	Helm Pelindung (Safety Helmet)		Buah	130,00	51.500	6.695.000
	Pelindung Mata (Goggles, Spectacles)		Set	20,00	206.000	4.120.000
	Pelindung Telinga (Ear Plus, Ear Nuff)		Set	60,00	51.500	3.090.000
	Pelindung Pernapasan dan Mulut (Masker)		Buah	1.440,00	51.500	74.160.000
	Sarung Tangan (Safety Gloves)		Set	400,00	5.150	2.060.000
	Sepatu Keselamatan (Safety Shoes)		set	260,00	257.500	66.950.000
	Penunjang Seluruh Tubuh (Full Body Harness)		Buah	20,00	103.000	2.060.000
	Rompi Keselamatan (Safety Vest)		Buah	130,00	154.500	20.085.000
	Jas Hujan (Raincoat)		Set	100,00	242.000	24.200.000

<b>D</b>	<b>Asuransi dan Perizinan</b>					
1.	BPJS Ketenagakerjaan dan Kesehatan Kerja	Ls	1,00	206.000.000	206.000.000	
<b>E</b>	<b>Personel K3 Konstruksi</b>					
1.	Ahli K3 Konstruksi (S1, AHLI MADYA, 3 TAHUN)	OB	24,00	23.844.500	572.268.000	
2.	Petugas K3 Konstruksi	OB	72,00	2.281.469	164.265.768	
3.	Petugas Pengatur Lalu Lintas (Flagman)	OB	144,00	2.281.469	328.531.536	
4.	Tenaga Medis (Dokter)	OK	8,00	1.600.000	12.800.000	
5.	Petugas Paramedis	OK	8,00	750.000	6.000.000	
<b>F</b>	<b>Fasilitas, Sarana, Prasarana dan Alat Kesehatan</b>					
1.	Peralatan P3K (Kotak P3K, Tandu, Obat Luka,	set	3,00	4.000.000	12.000.000	
<b>G</b>	<b>Rambu-Rambu yang Diperlukan</b>					
1.	Rambu Petunjuk	Buah	10,00	128.750	1.287.500	
2.	Rambu Larangan	Buah	10,00	128.750	1.287.500	
3.	Rambu Peringatan	Buah	10,00	128.750	1.287.500	
4.	Rambu Kewajiban	Buah	10,00	128.750	1.287.500	
5.	Rambu Informasi	Buah	10,00	128.750	1.287.500	
6.	Rambu Pekerjaan Sementara	Buah	10,00	128.750	1.287.500	
7.	Rambu Jalur Evakuasi	Buah	10,00	128.750	1.287.500	
8.	Tongkat Pengatur Lalu Lintas (Warning Lights Stick)	Buah	10,00	57.000	570.000	
9.	Kerucut Lalu Lintas (Rubber Cone)	Buah	20,00	36.050	721.000	
<b>H</b>	<b>Konsultasi dengan Ahli Terkait Keselamatan Konstruksi</b>					
1.	Ahli Struktur	Kegiatan	2,00	17.760.000	35.520.000	
2.	Ahli SDA	Kegiatan	2,00	17.760.000	35.520.000	
3.	Ahli Lingkungan	Kegiatan	2,00	17.760.000	35.520.000	
<b>I</b>	<b>Kegiatan dan peralatan terkait dengan pengendalian risiko Keselamatan Konstruksi</b>					
1.	APAR (Alat Pemadam Api Ringan)	Buah	10,00	537.500	5.375.000	
2.	Sirine	Set	5,00	361.000	1.805.000	
3.	Bendera K3 (Safety Flag)	Buah	10,00	58.900	589.000	
4.	Lampu darurat (emergency lamp)	Bh	10,00	200.000	2.000.000	
5.	CCTV Outdoor	Unit	5,00	1.399.000	6.995.000	
<b>J</b>	<b>Harga Satuan Pekerjaan</b>					<b>1.805.747.000</b>

**LAMPIRAN**  
**REKAPITULASIANALISIS HARGA SATUAN PEKERJAAN**  
**( A H S P )**

No. Analisis	Uraian Pekerjaan	Satuan	Harga Satuan (Rp)	Referensi
<b>C</b>	<b>RIVER WATERING &amp; DEWATERING WORK</b>			
C.01	1 Piece of Sand Geobag Size 145 x 240 cm	Buah	468.500	
C.02	Hourly operation of a 5 KW diesel water pump with a maximum suction head of	Jam	61.760	

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : C.01  
 Macam pekerjaan : 1 Piece of Sand Geobag Size 145 x 240 cm  
 Kuantitas pekerjaan : 1 Buah  
 Satuan pengukuran : Buah  
 Harga Satuan : Rp 468.500

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0,1800	91.259	16.427
2.	Tukang	L. 02	orang/hari	0,0600	91.259	5.476
3.	Mandor	L. 13	orang/hari	0,0180	100.000	1.800
<b>Jumlah Harga Tenaga Kerja</b>						<b>23.702</b>
<b>B</b>	<b>Bahan</b>					
1.	Geotextile Non Woven 500gr	M. 22	m2	7,5000	29.100	218.250
2.	Tali rafia/plastik	M. 83	m	3,2000	60	192
3.	Pasir Urug	M. 49	m3	0,4200	-	-
<b>Jumlah Harga Bahan</b>						<b>218.442</b>
<b>C</b>	<b>Peralatan</b>					
1.	Pemotong Kain / Geotekstil	E. 18	Hari	0,9420	191.100	180.016
2.	Mesin Jahit Geotekstil	E. 13	Hari	0,0190	197.400	3.751
<b>Jumlah Harga Peralatan</b>						<b>183.767</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>425.911</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>42.591</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - Buah (D + E)</b>					<b>468.500</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : C.02  
 Macam pekerjaan :  
 : Hourly operation of a 5 KW diesel water pump with a maximum suction head of 3 m and a maximum discharge head of 10 m (capacity 10 L/s at a suction head of 1 m and a discharge head of 10 m)  
 Kuantitas pekerjaan : 1 Jam  
 Satuan pengukuran : Jam  
 Harga Satuan : Rp 61.760

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
<b>Jumlah Harga Tenaga Kerja</b>						-
<b>B</b>	<b>Bahan</b>					
<b>Jumlah Harga Bahan</b>						-
<b>C</b>	<b>Peralatan</b>					
1.	Pompa Air	E. 19	jam	0,62	91.000	56.147
<b>Jumlah Harga Peralatan</b>						<b>56.147</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					56.147
<b>E</b>	<b>Overhead &amp; Profit (10%x D)</b>					5.615
<b>F</b>	<b>Harga Satuan Pekerjaan per - Jam (D + E)</b>					<b>61.760</b>

**LAMPIRAN**  
**REKAPITULASI ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. Analisis	Uraian Pekerjaan	Satuan	Harga Satuan (Rp)
<b>D</b>	<b>DEMOLITION WORKS</b>		
D.01	Demolition with RDB, Loading of Demolition Results (Rock f >25 cm) and Transpo	m3	53.760

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : D.01  
 Macam pekerjaan : Demolition with RDB, Loading of Demolition Results (Rock  $\phi$  >25 cm) and Transport, (mechanically, transported to the disposal area with a distance of up to 500 m)  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 53.760,00

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0,027	13.037	348
2.	Mandor	L. 13	orang/jam	0,0027	14.286	38
<b>Jumlah Harga Tenaga Kerja</b>						<b>386</b>
<b>B</b>	<b>Bahan</b>					
<b>Jumlah Harga Bahan</b>						<b>-</b>
<b>C</b>	<b>Peralatan</b>					
1.	Excavator Breaker	E. 010	jam	0,0267	743.200	19.818
2.	Excavator, 150-135 HP	E. 09	jam	0,0112	897.200	10.033
3.	Dump Truck, 7 ton	E. 08	jam	0,0468	398.300	18.636
<b>Jumlah Harga Peralatan</b>						<b>48.487</b>
<b>D</b>	<b>Jumlah (A+B+C)</b>					<b>48.873</b>
<b>E</b>	<b>Overhead &amp; Profit (10%x D)</b>					<b>4.887</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>3</sup> (D+E)</b>					<b>53.760</b>

**ANALISA PRODUKSIALAT**

Jenis Pekerjaan

: Membongkar dengan RDB, Muat Hasil Bongkar (Batu  $\phi > 25$  cm) dan Angkut  
(secara mekanis, diangkut ke disposal area dengan jarak sampai 500 m)

No.	Uraian	Kode	Koefisien	Satuan	Keterangan
<b>I</b>	<b>ASUMSI</b>				
1.	Jam Kerja efektif per hari	Tk	7,00	jam	
2.	Faktor konversi material batu asli (masif) ke lepas	Fk	1,65		Tabel A.1
3.	Ukuran maksimum batu 100 cm				
4.	Pelaksanaan Pembongkaran dan Pemuatan Batu Keras $\phi > 25$ cm dengan RDB + Excavator		9,22	m <sup>3</sup> /jam	
<b>II</b>	<b>PERHITUNGAN</b>				
<b>1.</b>	<b>BAHAN :</b>				
	Tidak ada bahan yang diperlukan				
<b>2.</b>	<b>ALAT :</b>				
a	<b>Excavator Breaker</b>				
	Kapasitas Produksi Membongkar (Memecah Pasangan Batu)	Q1	74,55	m <sup>3</sup> /jam	Batu Lunak
	Faktor Efisiensi Alat	Fa	0,83		Kondisi Baik
	Kapasitas Produksi / jam : $V \times Fa / Fk$	Q1'	37,50	m <sup>3</sup> /jam	
	Koefisien Alat / m <sup>3</sup> : $1 / Q1'$		0,03	jam	
b	<b>Pemuatan Material ke DT</b>				
	<b>Excavator, 150-135 HP</b>				
	Kapasitas Bucket	V	0,80	m <sup>3</sup>	
	Faktor Bucket	Fb	1,00		Tabel a.10
	Faktor Efisiensi Alat	Fa	0,83	-	Kondisi Baik
	Waktu Siklus	Ts1		menit	
	Mengeruk material dari StocSwing + Muat ke DT	T.1	0,30	menit	Tabel 10
		Ts.1'	0,30	menit	
	Kapasitas Produksi / jam = $(V \times Fb \times Fa \times 60) / (Ts.1 \times Fv \times Fk)$	Q2	89,43	m <sup>3</sup> /jam	Fv = Faktor
	Koefisien Alat / m <sup>3</sup> = $1 / Q2$		0,011	jam	Konversi Galian
c	<b>Pengangkutan Material ke Disposal Area</b>				
	<b>Dump Truck, 7 ton</b>				
	Jarak dari lokasi penggalian ke tempat lainnya	L	0,50	km	jarak rencana posisi disposal
	Kapasitas Bak	V	6,07	m <sup>3</sup>	1.35 - 1.65
	Faktor efisiensi alat	Fa	0,83		Kondisi Baik
	Kecepatan rata-rata bermuatan	V1	20,00	km/jam	Menanjak & Menurun
	Kecepatan rata-rata kosong	V2	30,00	km/jam	Menanjak & Menurun
	Faktor konversi bahan	Fk	1,65		Tabel A.1
	<b>Pengangkutan ke disposal area</b>				
	Waktu siklus	Ts.2			
	- Waktu memuat = $(V / Q2) \times 60$	T1	4,07	menit	
	- Waktu tempuh isi = $(L / V1) \times 60$	T2	1,50	menit	
	- Waktu tempuh kosong = $(L / V2) \times 60$	T3	1,00	menit	
	- Waktu lain-lain	T4	2,00	menit	
		Ts.2'	8,57	menit	
	Kapasitas Produksi / jam = $(V \times Fa \times 60) / (Ts.2' \times Fk)$	Q3	21,37	m <sup>3</sup> /jam	
	Koefisien alat / m <sup>3</sup> = $(1 : Q3)$		0,0468	jam	
<b>3.</b>	<b>TENAGA :</b>				
a	<b>Produksi : Excavator Breaker</b>				
	Produksi / hari = $Tk \times Q1'$	Q1'	37,50	m <sup>3</sup> /jam	
		Qt	262,51	m <sup>3</sup>	
	Kebutuhan Tenaga Kerja	P	1,00		
	Pekerja	M	1,00		
	Mandor				
	Koefisien Tenaga Kerja / m <sup>3</sup>				
	Pekerja $(Tk \times P) / Qt$		0,0267		
	Mandor $(Tk \times M) / Qt$		0,0027		

**LAMPIRAN**  
**REKAPITULASIAN ANALISIS HARGA SATUAN PEKERJAAN**  
**( A H S P )**

No. Analisis	Uraian Pekerjaan	Satuan	Harga Satuan (Rp)
<b>E</b>	<b>EARTHWORKS</b>		
E.01	Bowplank Installation	m'	63.330
E.02	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	20.740
E.03	1 m Excavation Cross Profile	m	26.120
E.04	Mechanical Sand Excavation (transported to disposal area, distance 0 m to 500 m)	m3	19.520
E.05	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	8.440
E.06	Backfill Sand (Material from Excavation, Mechanically)	m3	16.360

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : E.01  
 Macam pekerjaan : Bowplank Installation  
 Kuantitas pekerjaan : 1 m'  
 Satuan pengukuran : m'  
 Harga Satuan : Rp 63.330

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0,012	91.259	1.095
2.	Tukang kayu	L. 07	orang/hari	0,006	91.259	548
3.	Kepala tukang	L. 8	orang/hari	0,001	95.000	57
4.	Mandor	L. 13	orang/hari	0,001	100.000	120
<b>Jumlah Harga Tenaga Kerja</b>						<b>1.820</b>
<b>B</b>	<b>Bahan</b>					
1.	Kaso 5/7 cm	M. 32	m3	0,013	2.811.900	36.555
2.	Paku 1 cm - 2,5 cm	M. 39	kg	0,020	20.000	400
3.	Papan kayu bekisting	M. 45	m3	0,007	2.686.000	18.802
<b>Jumlah Harga Bahan</b>						<b>55.757</b>
<b>C</b>	<b>Peralatan</b>					
1.	Waterpass Digital	E. 22	hari	0,006	200.000	1.200
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>57.576</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>5.758</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m' (D + E)</b>					<b>63.330</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : E.02  
 Macam pekerjaan : Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5 /  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 20.740

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0,010	91.259	876
2.	Tukang kayu	L. 07	orang/hari	0,005	91.259	438
3.	Kepala tukang	L. 8	orang/hari	0,005	95.000	456
4.	Mandor	L. 13	orang/hari	0,001	100.000	96
<b>Jumlah Harga Tenaga Kerja</b>						<b>1.866</b>
<b>B</b>	<b>Bahan</b>					
1.	Kaso 5/7 cm	M. 32	m3	0,004	2.811.900	9.842
2.	Paku Payung	M. 43	Buah	1,100	6.500	7.150
<b>Jumlah Harga Bahan</b>						<b>16.992</b>
<b>C</b>	<b>Peralatan</b>					
1.	Waterpass Digital	E. 22	hari	0,005	200.000	960
2.	Theodolite Digital	E. 21	hari	0,005	350.000	1.680
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>18.858</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>1.886</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m2 (D + E)</b>					<b>20.740</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : E.03  
 Macam pekerjaan : 1 m Excavation Cross Profile  
 Kuantitas pekerjaan : 1 m  
 Satuan pengukuran : m  
 Harga Satuan : Rp 26.120

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0,007	91.259	657
2.	Tukang kayu	L. 07	orang/hari	0,004	91.259	329
3.	Kepala tukang	L. 8	orang/hari	0,000	95.000	34
4.	Mandor	L. 13	orang/hari	0,001	100.000	72
<b>Jumlah Harga Tenaga Kerja</b>						<b>1.092</b>
<b>B</b>	<b>Bahan</b>					
1.	Kaso 4/6 cm	M. 31	m3	0,003	2.811.900	7.030
2.	Papan Kayu Kelas III	M. 46	m3	0,004	2.595.600	10.902
3.	Paku 5 cm dan 7 cm	M. 40	kg	0,200	20.000	4.000
<b>Jumlah Harga Bahan</b>						<b>21.931</b>
<b>C</b>	<b>Peralatan</b>					
1.	Waterpass Digital	E. 22	hari	0,004	200.000	720
<b>Jumlah Harga Peralatan</b>						<b>720</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>23.743</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>2.374</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m (D + E)</b>					<b>26.120</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : E.04  
 Macam pekerjaan : Mechanical Sand Excavation (transported to disposal area, distance 0 m to 500 m)  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 19.520

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0,0166	13.037	216
2.	Mandor	L. 13	orang/jam	0,0017	14.286	24
<b>Jumlah Harga Tenaga Kerja</b>						<b>240</b>
<b>B</b>	<b>Bahan</b>					
<b>Jumlah Harga Bahan</b>						<b>-</b>
<b>C</b>	<b>Peralatan</b>					
1.	Excavator, 150-135 HP	E. 09	jam	0,0083	897.200	7.432
2.	Dump Truck, 7 ton	E. 08	jam	0,0253	398.300	10.079
<b>Jumlah Harga Peralatan</b>						<b>17.510</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>17.750</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>1.775</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m3 (D + E)</b>					<b>19.520</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : E.05  
 Macam pekerjaan : Mechanical Sand Excavation (excavated material is dumped nearby)  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 8.440

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0,0166	13.037	216
2.	Mandor	L. 13	orang/jam	0,0017	14.286	24
<b>Jumlah Harga Tenaga Kerja</b>						<b>240</b>
<b>B</b>	<b>Bahan</b>					
<b>Jumlah Harga Bahan</b>						<b>-</b>
<b>C</b>	<b>Peralatan</b>					
1.	Excavator, 150-135 HP	E. 09	jam	0,0083	897.200	7.432
<b>Jumlah Harga Peralatan</b>						<b>7.432</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>7.671</b>
<b>E</b>	<b>Overhead &amp; Profit (10%x D)</b>					<b>767</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m3 (D + E)</b>					<b>8.440</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : E.06  
 Macam pekerjaan : Backfill Sand (Material from Excavation, Mechanically)  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 16.360

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0,0166	13.037	216
2.	Mandor	L. 13	orang/jam	0,0017	14.286	24
<b>Jumlah Harga Tenaga Kerja</b>						<b>240</b>
<b>B</b>	<b>Bahan</b>					
<b>Jumlah Harga Bahan</b>						<b>-</b>
<b>C</b>	<b>Peralatan</b>					
1.	Excavator, 150-135 HP	E. 09	jam	0,0083	897.200	7.432
2.	Dump Truck, 7 ton	E. 08	jam	0,0181	398.300	7.199
<b>Jumlah Harga Peralatan</b>						<b>14.631</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>14.870</b>
<b>E</b>	<b>Overhead &amp; Profit (10%x D)</b>					<b>1.487</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m3 (D + E)</b>					<b>16.360</b>

**ANALISA PRODUKSIALAT**

Jenis Pekerjaan

: Galian Pasir

(secara mekanis, diangkut ke disposal area dengan jarak sampai 500 m)

No.	Uraian	Kode	Koefisien	Satuan	Keterangan
<b>I</b>	<b>ASUMSI</b>				
1.	Menggunakan alat berat (cara mekanis)				
2.	Pekerjaan meliputi penggalian dan pengangkutan ke disposal area				
3.	Perataan di lokasi disposal				
4.	Waktu jam kerja efektif	Tk	7,00	jam	
<b>II</b>	<b>URUTAN KERJA</b>				
1.	Menentukan batas-batas galian				
2.	Penggalian dilakukan dengan menggunakan Excavator sekaligus memuat material hasil galian ke dalam Dump Truck				
3.	Dump Truck mengangkut material hasil galian - Ke disposal area	L1	0,50	km	
<b>III</b>	<b>PERHITUNGAN</b>				
<b>1.</b>	<b>BAHAN :</b>				
	Tidak ada bahan yang diperlukan				
<b>2.</b>	<b>ALAT :</b>				
	Excavator, 150-135 HP				
	Kapasitas Bucket	V	0,80	m3	
	Faktor Bucket	Fb	1,00	-	kondisi sedang
	Faktor efisien alat	Fa	0,83	-	kondisi baik
	Faktor konversi galian	Fv	0,90	-	Normal
	Faktor konversi bahan (asli-lepas)	Fk	1,00	-	Pasir asli
	Waktu siklus	Ts			
	- Waktu mengeruk material, swing+muat ke DT	T1	0,37	menit	Ringan,180 <sup>o</sup> ,DT
		Ts	0,37	menit	
	Kapasitas Produksi / jam = $(V \times Fb \times Fa \times 60) / (Ts \times Fk \times Fv)$	Q1	120,73	m3	
	Koefisien alat / m3 = $(1 : Q1)$		0,0083	jam	
	Dump Truck, 7 ton				
	Kapasitas bak	V	5,00	m3	
	Berat volume bahan (lepas)	D	1,40	ton/m3	berat jenis pasir
	Faktor efisiensi alat	Fa	0,83		kondisi baik
	Kecepatan rata-rata bermuatan	V1	20,00	km/jam	menanjak menurun
	Kecepatan rata-rata kosong	V2	30,00	km/jam	menanjak menurun
	Faktor konversi bahan	Fk	1,00		normal
	<b>Pengangkutan ke spoil bank</b>				
	Waktu siklus	Ts			
	- Waktu tempuh isi = $(L1 / V1) \times 60$	T2	1,50	menit	
	- Waktu tempuh kosong = $(L1 / V2) \times 60$	T3	1,00	menit	
	- Waktu lain-lain	T4	2,00	menit	
		Ts	4,50	menit	
	Kapasitas Produksi / jam = $(V \times Fa \times 60) / (D \times Ts \times Fk)$	Q2	39,52	m3	
	Koefisien alat / m3 = $(1 : Q2)$		0,0253	jam	
<b>3.</b>	<b>TENAGA :</b>				
	<b>Produksi menentukan : Excavator</b>				
	Produksi / hari = $Tk \times Q1$	Q1	120,73	m3/jam	
	Kebutuhan tenaga :	Qt	845,09	m3/jam	
	- Mandor	M	1,00		
	- Pekerja	PT	2,00		
	Koefisien :				
	- Mandor = $(Tk \times M) : Qt$		0,0017	jam	
	- Pekerja = $(Tk \times M) : Qt$		0,0166	jam	

**ANALISA PRODUKSIALAT**

Jenis Pekerjaan : Galian Pasir  
(secara mekanis, hasil galian ditaruh disekitar)

No.	Uraian	Kode	Koefisien	Satuan	Keterangan
<b>I</b>	<b>ASUMSI</b>				
1.	Menggunakan alat berat (cara mekanis)				
2.	Waktu jam kerja efektif	Tk	7,00	jam	
<b>II</b>	<b>URUTAN KERJA</b>				
1.	Menentukan Kap. Bucket, V, Fa, Fv (kedalaman galian)				
2.	Menghitung waktu siklus untuk memuat material di hasil galian				
3.	Menghitung kap. Produksi untuk menentukan besaran koefisien alat				
<b>III</b>	<b>PERHITUNGAN</b>				
<b>1.</b>	<b>BAHAN :</b>				
	Tidak ada bahan yang diperlukan				
<b>2.</b>	<b>ALAT :</b>				
	<b>Excavator, 150-135 HP</b>				
	Kapasitas Bucket	V	0,80	m3	
	Faktor Bucket	Fb	1,00	-	kondisi sedang
	Faktor efisien alat	Fa	0,83	-	kondisi baik
	Faktor konversi galian	Fv	0,90	-	Normal
	Faktor konversi bahan (asli-lepas)	Fk	1,00	-	Pasir asli
	Waktu siklus	Ts			
	- Waktu mengeruk material, swing+muat ke DT	T1	0,37	menit	Ringan, 180°, DT
		Ts	0,37	menit	
	Kapasitas Produksi / jam = $(V \times Fb \times Fa \times 60) / (Ts \times Fk \times Fv)$	Q1	120,73	m3	
	Koefisien alat / m3 = $(1 : Q1)$		0,0083	jam	
<b>3.</b>	<b>TENAGA :</b>				
	<b>Produksi menentukan : Excavator</b>	Q1	120,73	m3/jam	
	Produksi / hari = $Tk \times Q1$	Qt	845,09	m3/jam	
	Kebutuhan tenaga :				
	- Mandor	M	1,00		
	- Pekerja	P	2,00		
	Koefisien :				
	- Mandor = $(Tk \times M) : Qt$		0,0017	jam	
	- Pekerja = $(Tk \times P) : Qt$		0,0166	jam	

ANALISA PRODUKSIALAT						
Jenis Pekerjaan		: Timbunan Pasir Kembali				
		(Material dari hasil galian)				
Satuan Pembayaran		: m3				
No.	Uraian	Kode	Koefisien	Satuan	Keterangan	
<b>I ASUMSI</b>						
1.	Menggunakan alat berat (cara mekanis)					
2.	Pekerjaan meliputi penimbunan, penghamparan dan perapihan					
3.	Waktu jam kerja efektif	Tk	7,00	jam		
<b>II URUTAN KERJA</b>						
1.	Material timbunan diambil dari bekas galian dengan Excavator dan memuat ke dalam Dum Truck	L	0,50	km		
2.	Dump truck mengangkut pasir ke area timbunan					
3.	Material disebar dengan Excavator					
<b>III PERHITUNGAN</b>						
<b>1 Excavator, 150-135 HP</b>						
	Kapasitas Bucket	V	0,80	m3		
	Faktor Bucket	Fb	1,00			kondisi sedang
	Faktor efisien alat	Fa	0,83			kondisi baik
	Faktor konversi galian	Fv	0,90			Normal
	Faktor konversi bahan	Fk	1,00	-		Pasir asli
	Waktu siklus	Ts				
	waktu standar (menggali-swing-muat-swing kembali)	Ts1	0,37	menit		
	Kapasitas Produksi / jam	$(V \times Fb \times Fa \times 60) / (Ts \times Fk)$	Q1	120,73	m3	
	Koefisien alat / m3 = (1 : Q1)		0,0083	jam		
<b>2 Dump Truck, 7 ton</b>						
	Kapasitas bak	V	5,00	ton/m3		
	Berat volume bahan	D	1,40	ton/m3		
	Faktor efisiensi alat	Fa	0,83	-		kondisi baik sekali
	Kecepatan rata-rata bermuatan	V1	20,00	km/jam		menanjak-menurun
	Kecepatan rata-rata kosong	V2	30,00	km/jam		tabel 8
<b>Pengangkutan</b>						
	Waktu siklus	Ts				
	- Waktu tempuh isi	$= (L2 / V1) \times 60$	T1	1,50	menit	
	- Waktu tempuh kosong	$= (L2 / V2) \times 60$	T2	1,00	menit	
	- Waktu lain-lain (waktu pasti)	$=$ (penumpahan & ambil posisi siap dimuat kembali)	T3	2,00	menit	1,25 - 1,65 menit
			Ts	4,50	menit	
	Kapasitas Produksi / jam	$(V \times Fa \times 60) / Ts$	Q2	55,33	m3	
	Koefisien alat / m3 = (1 : Q2)		0,0181	jam		
<b>3 Mesin Stamper</b>						
	Kecepatan lintasan rata-rata pemadatan	V	1,00	km/jam		
	Faktor efisiensi alat	Fa	0,83	m		
	Tebal pemadatan	t	0,20	m		
	Lebar telapak	Lbr	0,50	m		
	Jumlah lapisan	N	1,00	m		
	Banyak Tumbukan	n	6,00	tumbukan		
	Kapasitas Produksi / jam		Q5	13,83	m3	
	Koefisien alat / m3 = (1 : Q5)		0,0723	Jam		
<b>3. TENAGA :</b>						
	<b>Produksi menentukan : Excava</b>	Excavator, 150-135 HP	120,73	m3/jam		
	Produksi / hari	$= Tk \times Qt$	845,09			
	Kebutuhan tenaga :					
	- Mandor	M	1,00			
	- Pekerja	P	2,00			
	Koefisien :					
	- Mandor	$= (Tk \times M) : Qt$	0,0017	jam		
	- Pekerja	$= (Tk \times P) : Qt$	0,0166	jam		

**LAMPIRAN**  
**REKAPITULASIANALISIS HARGA SATUAN PEKERJAAN**  
**( A H S P )**

No. Analysis	Uraian Pekerjaan	Satuan	Harga Satuan (Rp)
<b>F</b>	<b>CONCRETE WORK</b>		
F.01	Concrete Making and Casting fc' = 30 Mpa (K 350) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	1.289.590
F.02	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	1.123.910
F.03	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanical Transported radius 2000 m	m3	1.109.990
F.04	Concrete Making and Casting fc' = 15 Mpa (K 175) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	1.060.070
F.05	Concrete Making and Casting fc' = 10 Mpa (K 125) Mechanical Transported radius 2000 m	m3	986.860
F.06	Manufacturing and Casting of 1 m3 of low quality concrete fc' = 10 Mpa; W/C = 0.700 Semi Mechanical	m3	1.006.260
F.07	Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Split Stone, with Concrete Pump	m3	842.630
F.08	Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Split Stone	m3	828.710
F.09	1 kg Slab reinforcement for BjTP or BjTS diameter > 12 mm Semi-Mechanical	Kg	15.100
F.10	1 m2 Exposed Formwork for Concrete Floor Slabs with Multiflex 18 mm (TP), JaTm 0.60 m	m2	127.830
F.11	1 m2 Regular Concrete Floor Formwork with Multiflex 12 mm or 18 mm (TP)	m2	88.660
F.12	1 m2 Concrete Floor Formwork Scaffolding with 5/7 cm Rafters 4.00 m high, JaTm 0.60 m	m2	117.400
F.13	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	143.250
F.14	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	95.770
F.15	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.5	m2	96.260
F.16	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	6.680
F.17	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	4.460
F.18	Construction Joint Sealant	m3	37.480
F.19	Construction Joint Filler	m3	81.370
F.20	Geotextile, Medium thickness (> 400 to < 800 gr), Manual	m2	38.590

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.01  
 Concrete Making and Casting  $f_c' = 30$  Mpa (K 350)  
 Macam pekerjaan : Mechanically Transported within a radius of 2000 m with a  
 Concrete Pump (CP)  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 1.289.590

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A Tenaga Kerja</b>						
1.	Pekerja	L. 01	orang/jam	0,7028	13.037	9.163
2.	Tukang Batu	L. 03	orang/jam	0,1406	13.037	1.833
3.	Kepala Tukang Batu	L. 9	orang/jam	0,0141	13.571	191
4.	Mandor	L. 13	orang/jam	0,0703	14.286	1.004
<b>Jumlah Harga Tenaga Kerja</b>						<b>12.190</b>
<b>B Bahan</b>						
1.	Semen Portland	M. 73	kg	457,00	1.523	695.783
2.	Pasir Beton	M. 47	m3	681,00	141	95.781
3.	Kerikil Beton	M. 35	m3	1.009,00	226	228.067
4.	Air	M. 01	liter	202,00	-	-
<b>Jumlah Harga Bahan</b>						<b>1.019.630</b>
<b>C Peralatan</b>						
1.	Wheel Loader, 1.0-1.6 m3	E. 23	jam	0,0155	491.000	7.608
2.	Batching Plant, 60 m3/jam	E. 02	jam	0,0201	1.019.600	20.474
3.	Agitator Truck, 8 m3	E. 01	jam	0,0819	1.096.000	89.789
4.	Concrete Pump Trailer, 60 m3/jam	E. 04	jam	0,0201	630.300	12.657
5.	Concrete Vibrator	E. 05	jam	0,1854	54.000	10.009
<b>Jumlah Harga Peralatan</b>						<b>140.536</b>
<b>D Jumlah (A + B + C)</b>						<b>1.172.356</b>
<b>E Overhead &amp; Profit (10%x D)</b>						<b>117.236</b>
<b>F Harga Satuan Pekerjaan per - m3 (D + E)</b>						<b>1.289.590</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.02  
Concrete Making and Casting  $f_c' = 20$  Mpa (K 225)  
Macam pekerjaan : Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)  
Kuantitas pekerjaan : 1 m<sup>3</sup>  
Satuan pengukuran : m<sup>3</sup>  
Harga Satuan : Rp 1.123.910

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A Tenaga Kerja</b>						
1.	Pekerja	L. 01	orang/jam	0,7028	13.037	9.163
2.	Tukang Batu	L. 03	orang/jam	0,1406	13.037	1.833
3.	Kepala Tukang Batu	L. 9	orang/jam	0,0141	13.571	191
4.	Mandor	L. 13	orang/jam	0,0703	14.286	1.004
<b>Jumlah Harga Tenaga Kerja</b>						<b>12.190</b>
<b>B Bahan</b>						
1.	Semen Portland	M. 73	kg	348,00	1.523	529.830
2.	Pasir Beton	M. 47	m3	790,00	141	111.111
3.	Kerikil Beton	M. 35	m3	1.009,00	226	228.067
4.	Air	M. 01	liter	202,00	-	-
<b>Jumlah Harga Bahan</b>						<b>869.008</b>
<b>C Peralatan</b>						
1.	Wheel Loader, 1.0-1.6 m3	E. 23	jam	0,0155	491.000	7.608
2.	Batching Plant, 60 m3/jam	E. 02	jam	0,0201	1.019.600	20.474
3.	Agitator Truck, 8 m3	E. 01	jam	0,0819	1.096.000	89.789
4.	Concrete Pump Trailer, 60 m3/jam	E. 04	jam	0,0201	630.300	12.657
5.	Concrete Vibrator	E. 05	jam	0,1854	54.000	10.009
<b>Jumlah Harga Peralatan</b>						<b>140.536</b>
<b>D Jumlah (A + B + C)</b>						<b>1.021.734</b>
<b>E Overhead &amp; Profit (10% x D)</b>						<b>102.173</b>
<b>F Harga Satuan Pekerjaan per - m3 (D + E)</b>						<b>1.123.910</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.03  
 Macam pekerjaan : Concrete Making and Casting  $f_c' = 20$  Mpa (K 225)  
 : Mechanical Transported radius 2000 m  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 1.109.990

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A Tenaga Kerja</b>						
1.	Pekerja	L. 01	orang/jam	0,7028	13.037	9.163
2.	Tukang Batu	L. 03	orang/jam	0,1406	13.037	1.833
3.	Kepala Tukang Batu	L. 9	orang/jam	0,0141	13.571	191
4.	Mandor	L. 13	orang/jam	0,0703	14.286	1.004
<b>Jumlah Harga Tenaga Kerja</b>						<b>12.190</b>
<b>B Bahan</b>						
1.	Semen Portland	M. 73	kg	348,00	1.523	529.830
2.	Pasir Beton	M. 47	m3	790,00	141	111.111
3.	Kerikil Beton	M. 35	m3	1.009,00	226	228.067
4.	Air	M. 01	liter	202,00	-	-
<b>Jumlah Harga Bahan</b>						<b>869.008</b>
<b>C Peralatan</b>						
1.	Wheel Loader, 1.0-1.6 m3	E. 23	jam	0,0155	491.000	7.608
2.	Batching Plant, 60 m3/jam	E. 02	jam	0,0201	1.019.600	20.474
3.	Agitator Truck, 8 m3	E. 01	jam	0,0819	1.096.000	89.789
4.	Concrete Vibrator	E. 05	jam	0,1854	54.000	10.009
<b>Jumlah Harga Peralatan</b>						<b>127.880</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>1.009.077</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>100.908</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m3 (D + E)</b>					<b>1.109.990</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.04  
 Concrete Making and Casting  $f_c' = 15$  Mpa (K 175)  
 Macam pekerjaan : Mechanically Transported within a radius of 2000 m with a  
 Concrete Pump (CP)  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 1.060.070

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A Tenaga Kerja</b>						
1.	Pekerja	L. 01	orang/jam	0,7028	13.037	9.163
2.	Tukang Batu	L. 03	orang/jam	0,1406	13.037	1.833
3.	Kepala Tukang Batu	L. 9	orang/jam	0,0141	13.571	191
4.	Mandor	L. 13	orang/jam	0,0703	14.286	1.004
<b>Jumlah Harga Tenaga Kerja</b>						<b>12.190</b>
<b>B Bahan</b>						
1.	Semen Portland	M. 73	kg	306,00	1.523	465.885
2.	Pasir Beton	M. 47	m3	832,00	141	117.018
3.	Kerikil Beton	M. 35	m3	1.009,00	226	228.067
4.	Air	M. 01	liter	202,00	-	-
<b>Jumlah Harga Bahan</b>						<b>810.970</b>
<b>C Peralatan</b>						
1.	Wheel Loader, 1.0-1.6 m3	E. 23	jam	0,0155	491.000	7.608
2.	Batching Plant, 60 m3/jam	E. 02	jam	0,0201	1.019.600	20.474
3.	Agitator Truck, 8 m3	E. 01	jam	0,0819	1.096.000	89.789
4.	Concrete Pump Trailer, 60 m3/jam	E. 04	jam	0,0201	630.300	12.657
5.	Concrete Vibrator	E. 05	jam	0,1854	54.000	10.009
<b>Jumlah Harga Peralatan</b>						<b>140.536</b>
<b>F</b>	<b>Jumlah (A + B + C)</b>					<b>963.696</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x F)</b>					<b>96.370</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - 1 m3 (F + E)</b>					<b>1.060.070</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.05  
 Macam pekerjaan : Concrete Making and Casting  $f_c' = 10$  Mpa (K 125)  
 : Mechanical Transported radius 2000 m  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 986.860 0,03514

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A Tenaga Kerja</b>						
1.	Pekerja	L. 01	orang/jam	0,7028	13.037	9.163
2.	Tukang Batu	L. 03	orang/jam	0,1406	13.037	1.833
3.	Kepala Tukang Batu	L. 9	orang/jam	0,0141	13.571	191
4.	Mandor	L. 13	orang/jam	0,0703	14.286	1.004
<b>Jumlah Harga Tenaga Kerja</b>						<b>12.190</b>
<b>B Bahan</b>						
1.	Semen Portland	M. 73	kg	267,00	1.523	406.508
2.	Pasir Beton	M. 47	m3	871,00	141	122.504
3.	Kerikil Beton	M. 35	m3	1.009,00	226	228.067
4.	Air	M. 01	liter	202,00	-	-
<b>Jumlah Harga Bahan</b>						<b>757.078</b>
<b>C Peralatan</b>						
1.	Wheel Loader, 1.0-1.6 m3	E. 23	jam	0,0155	491.000	7.608
2.	Batching Plant, 60 m3/jam	E. 02	jam	0,0201	1.019.600	20.474
3.	Agitator Truck, 8 m3	E. 01	jam	0,0819	1.096.000	89.789
4.	Concrete Vibrator	E. 05	jam	0,1854	54.000	10.009
<b>Jumlah Harga Peralatan</b>						<b>127.880</b>
<b>F</b>	<b>Jumlah (A + B + C)</b>					<b>897.147</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x F)</b>					<b>89.715</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - 1 m3 (F + E)</b>					<b>986.860</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.06  
 Macam pekerjaan : Manufacturing and Casting of 1 m3 of low quality concrete  
 :  $f_c' = 10$  Mpa; W/C = 0.700 Semi Mechanical  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 1.006.260

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A Tenaga Kerja</b>						
1.	Pekerja	L. 01	orang/hari	1,0000	91.259	91.259
2.	Tukang Batu	L. 03	orang/hari	0,2500	91.259	22.815
3.	Kepala Tukang Batu	L. 9	orang/hari	0,0250	95.000	2.375
4.	Mandor	L. 13	orang/hari	0,1000	100.000	10.000
<b>Jumlah Harga Tenaga Kerja</b>						<b>126.448</b>
<b>B Bahan</b>						
1.	Semen Portland	M. 73	kg	279,0000	1.523	424.778
2.	Pasir Beton	M. 47	m3	0,6236	200.000	124.714
3.	Kerikil Beton	M. 35	m3	0,6733	290.000	195.267
4.	Air	M. 01	liter	195,0000	-	-
<b>Jumlah Harga Bahan</b>						<b>744.758</b>
<b>C Peralatan</b>						
1.	Molen, 0.35 m3	E. 17	Hari	0,1475	295.400	43.572
<b>Jumlah Harga Peralatan</b>						<b>43.572</b>
<b>F Jumlah (A + B + C)</b>						<b>914.778</b>
<b>E Overhead &amp; Profit (10% x F)</b>						<b>91.478</b>
<b>F Harga Satuan Pekerjaan per - 1 m3 (F + E)</b>						<b>1.006.260</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.07  
 Macam pekerjaan : Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Split Stone, with Concrete Pump (CP)  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 842.630

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A Tenaga Kerja</b>						
1.	Pekerja	L. 01	orang/jam	0,7028	13.037	9.163
2.	Tukang Batu	L. 03	orang/jam	0,1406	13.037	1.833
3.	Kepala Tukang Batu	L. 9	orang/jam	0,0141	13.571	191
4.	Mandor	L. 13	orang/jam	0,0703	14.286	1.004
<b>Jumlah Harga Tenaga Kerja</b>						<b>12.190</b>
<b>B Bahan</b>						
1.	Batu Belah	M. 7	m3	0,528	240.000	126.720
1.	Semen Portland	M. 73	kg	183,60	1.523	279.531
2.	Pasir Beton	M. 47	m3	499,20	141	70.211
3.	Kerikil Beton	M. 35	m3	605,40	226	136.840
4.	Air	M. 01	liter	121,20	-	-
<b>Jumlah Harga Bahan</b>						<b>613.302</b>
<b>C Peralatan</b>						
1.	Wheel Loader, 1.0-1.6 m3	E. 23	jam	0,0155	491.000	7.608
2.	Batching Plant, 60 m3/jam	E. 02	jam	0,0201	1.019.600	20.474
3.	Agitator Truck, 8 m3	E. 01	jam	0,0819	1.096.000	89.789
4.	Concrete Pump Trailer, 60 m3/jam	E. 04	jam	0,0201	630.300	12.657
5.	Concrete Vibrator	E. 05	jam	0,1854	54.000	10.009
<b>Jumlah Harga Peralatan</b>						<b>140.536</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>766.028</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>76.603</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m3 (D + E)</b>					<b>842.630</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.08  
 Macam pekerjaan : Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Split Stone  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 828.710

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A Tenaga Kerja</b>						
1.	Pekerja	L. 01	orang/jam	0,7028	13.037	9.163
2.	Tukang Batu	L. 03	orang/jam	0,1406	13.037	1.833
3.	Kepala Tukang Batu	L. 9	orang/jam	0,0141	13.571	191
4.	Mandor	L. 13	orang/jam	0,0703	14.286	1.004
<b>Jumlah Harga Tenaga Kerja</b>						<b>12.190</b>
<b>B Bahan</b>						
1.	Batu Belah	M. 7	m3	0,528	240.000	126.720
1.	Semen Portland	M. 73	kg	183,60	1.523	279.531
2.	Pasir Beton	M. 47	m3	499,20	141	70.211
3.	Kerikil Beton	M. 35	m3	605,40	226	136.840
4.	Air	M. 01	liter	121,20	-	-
<b>Jumlah Harga Bahan</b>						<b>613.302</b>
<b>C Peralatan</b>						
1.	Wheel Loader, 1.0-1.6 m3	E. 23	jam	0,0155	491.000	7.608
2.	Batching Plant, 60 m3/jam	E. 02	jam	0,0201	1.019.600	20.474
3.	Agitator Truck, 8 m3	E. 01	jam	0,0819	1.096.000	89.789
4.	Concrete Vibrator	E. 05	jam	0,1854	54.000	10.009
<b>Jumlah Harga Peralatan</b>						<b>127.880</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>753.372</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>75.337</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m3 (D + E)</b>					<b>828.710</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.09  
 Macam pekerjaan : 1 kg Slab reinforcement for BjTP or BjTS diameter > 12 mm  
 (cutting, bending and fitting)  
 Kuantitas pekerjaan : 1 Kg  
 Satuan pengukuran : Kg  
 Harga Satuan : Rp 15.100

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0,00080	91.259	73
2.	Tukang Besi	L. 04	orang/hari	0,00040	91.259	37
3.	Kepala Tukang Besi	L. 10	orang/hari	0,00004	95.000	4
4.	Mandor	L. 13	orang/hari	0,00008	100.000	8
<b>Jumlah Harga Tenaga Kerja</b>						<b>121</b>
<b>B</b>	<b>Bahan</b>					
1.	Besi Beton Ulir	M. 12	kg	1,020	13.000	13.260
2.	Kawat Ikat Beton (Bendrat)	M. 33	kg	0,015	21.000	315
<b>Jumlah Harga Bahan</b>						<b>13.575</b>
<b>C</b>	<b>Peralatan</b>					
1.	bar bender	E. 14	Hari	0,0002	70.000	14
2.	bar cutter	E. 15	Hari	0,0002	70.000	14
<b>Jumlah Harga Peralatan</b>						<b>28</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>13.724</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>1.372</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - 1 Kg (D + E)</b>					<b>15.100</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.10  
 Macam pekerjaan : 1 m<sup>2</sup> Exposed Formwork for Concrete Floor Slabs with  
 Multiflex 18 mm (TP), JaTm 0.60 m  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 127.830

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0,3000	91.259	27.378
2.	Tukang Kayu	L. 07	orang/hari	0,3000	91.259	27.378
3.	Kepala Tukang Kayu	L. 12	orang/hari	0,0300	95.000	2.850
4.	Mandor	L. 13	orang/hari	0,0300	100.000	3.000
<b>Jumlah Harga Tenaga Kerja</b>						<b>60.605</b>
<b>B</b>	<b>Bahan</b>					
1.	Multipleks, 18 mm	M. 38	lembar	0,1280	207.300	26.534
2.	Kaso 5/7 cm	M. 32	m <sup>3</sup>	0,0060	2.811.900	16.871
3.	Paku 5 cm dan 7 cm	M. 40	kg	0,2800	20.000	5.600
4.	Minyak bekisting	M. 37	liter	0,2500	26.400	6.600
<b>Jumlah Harga Bahan</b>						<b>55.606</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>116.211</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>11.621</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>2</sup> (D + E)</b>					<b>127.830</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.11  
 Macam pekerjaan : 1 m<sup>2</sup> Regular Concrete Floor Formwork with Multiflex 12 mm or 18 mm (TP)  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 88.660

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0,2000	91.259	18.252
2.	Tukang Kayu	L. 07	orang/hari	0,1000	91.259	9.126
3.	Kepala Tukang Kayu	L. 12	orang/hari	0,0100	95.000	950
4.	Mandor	L. 13	orang/hari	0,0200	100.000	2.000
<b>Jumlah Harga Tenaga Kerja</b>						<b>30.328</b>
<b>B</b>	<b>Bahan</b>					
1.	Multipleks, 18 mm	M. 38	lembar	0,1280	207.300	26.534
2.	Kaso 5/7 cm	M. 32	m <sup>3</sup>	0,0050	2.811.900	14.060
3.	Paku 5 cm dan 7 cm	M. 40	kg	0,2200	20.000	4.400
4.	Minyak bekisting	M. 37	liter	0,2000	26.400	5.280
<b>Jumlah Harga Bahan</b>						<b>50.274</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>80.602</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>8.060</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>2</sup> (D + E)</b>					<b>88.660</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.12  
 Macam pekerjaan : 1 m<sup>2</sup> Concrete Floor Formwork Scaffolding with 5/7 cm  
 Rafters 4.00 m high, JaTm 0.60 m  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 117.400

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0,3000	91.259	27.378
2.	Tukang Kayu	L. 07	orang/hari	0,1500	91.259	13.689
3.	Kepala Tukang Kayu	L. 12	orang/hari	0,0150	95.000	1.425
4.	Mandor	L. 13	orang/hari	0,0300	100.000	3.000
<b>Jumlah Harga Tenaga Kerja</b>						<b>45.491</b>
<b>B</b>	<b>Bahan</b>					
1.	Kaso 5/7 cm	M. 32	m3	0,0200	2.811.900	56.238
2.	Paku 5 cm dan 7 cm	M. 40	kg	0,2500	20.000	5.000
<b>Jumlah Harga Bahan</b>						<b>61.238</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>106.729</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>10.673</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>2</sup> (D + E)</b>					<b>117.400</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.13  
 Macam pekerjaan : 1 m<sup>2</sup> Exposed Concrete Wall Formwork with 18 mm  
 Multiflex  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 143.250

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0,3600	91.259	32.853
2.	Tukang Kayu	L. 07	orang/hari	0,3600	91.259	32.853
3.	Kepala Tukang Kayu	L. 12	orang/hari	0,0360	95.000	3.420
4.	Mandor	L. 13	orang/hari	0,0360	100.000	3.600
<b>Jumlah Harga Tenaga Kerja</b>						<b>72.726</b>
<b>B</b>	<b>Bahan</b>					
1.	Multipleks, 18 mm	M. 38	lembar	0,1280	207.300	26.534
2.	Kaso 5/7 cm	M. 32	m <sup>3</sup>	0,0070	2.811.900	19.683
3.	Paku 5 cm dan 7 cm	M. 40	kg	0,3000	20.000	6.000
4.	Minyak bekisting	M. 37	liter	0,2000	26.400	5.280
<b>Jumlah Harga Bahan</b>						<b>57.498</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>130.224</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>13.022</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>2</sup> (D + E)</b>					<b>143.250</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.14  
 Macam pekerjaan : 1 m<sup>2</sup> Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 95.770

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0,2400	91.259	21.902
2.	Tukang Kayu	L. 07	orang/hari	0,1200	91.259	10.951
3.	Kepala Tukang Kayu	L. 12	orang/hari	0,0120	95.000	1.140
4.	Mandor	L. 13	orang/hari	0,0240	100.000	2.400
<b>Jumlah Harga Tenaga Kerja</b>						<b>36.393</b>
<b>B</b>	<b>Bahan</b>					
1.	Multipleks, 18 mm	M. 38	lembar	0,1280	207.300	26.534
2.	Kaso 5/7 cm	M. 32	m <sup>3</sup>	0,0050	2.811.900	14.060
3.	Paku 5 cm dan 7 cm	M. 40	kg	0,2400	20.000	4.800
4.	Minyak bekisting	M. 37	liter	0,2000	26.400	5.280
<b>Jumlah Harga Bahan</b>						<b>50.674</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>87.067</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>8.707</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>2</sup> (D + E)</b>					<b>95.770</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.15  
 Macam pekerjaan : 1 m<sup>2</sup> Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 96.260

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0,360	91.259	32.853
2.	Tukang Kayu	L. 07	orang/hari	0,180	91.259	16.427
3.	Kepala Tukang Kayu	L. 12	orang/hari	0,018	95.000	1.710
4.	Mandor	L. 13	orang/hari	0,036	100.000	3.600
<b>Jumlah Harga Tenaga Kerja</b>						<b>54.590</b>
<b>B</b>	<b>Bahan</b>					
1.	Kaso 5/7 cm	M. 32	m3	0,010	2.811.900	28.119
2.	Paku 5 cm dan 7 cm	M. 40	kg	0,240	20.000	4.800
<b>Jumlah Harga Bahan</b>						<b>32.919</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>87.509</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>8.751</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>2</sup> (D + E)</b>					<b>96.260</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.16  
 Macam pekerjaan : Carefully dismantle 1 m2 of Formwork and Scaffolding  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 6.680

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0,0600	91.259	5.476
2.	Mandor	L. 13	orang/hari	0,0060	100.000	600
<b>Jumlah Harga Tenaga Kerja</b>						<b>6.076</b>
<b>B</b>	<b>Bahan</b>					
<b>Jumlah Harga Bahan</b>						<b>-</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>6.076</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>608</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m2 (D + E)</b>					<b>6.680</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.17  
 Macam pekerjaan : Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 4.460

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0,0400	91.259	3.650
2.	Mandor	L. 13	orang/hari	0,0040	100.000	400
<b>Jumlah Harga Tenaga Kerja</b>						<b>4.050</b>
<b>B</b>	<b>Bahan</b>					
<b>Jumlah Harga Bahan</b>						<b>-</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>4.050</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>405</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m2 (D + E)</b>					<b>4.460</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.18  
 Macam pekerjaan : Construction Joint Sealant  
 Kuantitas pekerjaan : 1 m3  
 Satuan pengukuran : m3  
 Harga Satuan : Rp 37.480

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0,0460	91.259	4.198
2.	Tukang	L. 02	orang/hari	0,0230	91.259	2.099
3.	Mandor	L. 13	orang/hari	0,0046	100.000	460
<b>Jumlah Harga Tenaga Kerja</b>						<b>6.757</b>
<b>B</b>	<b>Bahan</b>					
1.	Joint Sealant	M. 29	kg	0,8160	33.480	27.320
<b>Jumlah Harga Bahan</b>						<b>27.320</b>
<b>C</b>	<b>Peralatan</b>					
1.	Grouting Pump 0,50-1,5 m3/jam, 25 Ba	E. 11	jam	0,0460	-	-
2.	Diesel Generator, 2 kVA	E. 12	jam	0,0230	-	-
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>34.077</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>3.408</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m3 (D + E)</b>					<b>37.480</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.19  
 Macam pekerjaan : Construction Joint Filler  
 Kuantitas pekerjaan : 1 m3  
 Satuan pengukuran : m3  
 Harga Satuan : Rp 81.370

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0,0460	91.259	4.198
2.	Tukang	L. 02	orang/hari	0,0230	91.259	2.099
3.	Mandor	L. 13	orang/hari	0,0046	100.000	460
<b>Jumlah Harga Tenaga Kerja</b>						<b>6.757</b>
<b>B</b>	<b>Bahan</b>					
1.	Joint Filler, t = 20 mm	M. 28	m3	1,0200	65.900	67.218
<b>Jumlah Harga Bahan</b>						<b>67.218</b>
<b>C</b>	<b>Peralatan</b>					
1.	Grouting Pump 0,50-1,5 m3/jam, 25 Ba	E. 11	Hari	0,0230	-	-
2.	Diesel Generator, 2 kVA	E. 12	Hari	0,0230	-	-
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>73.975</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>7.397</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m3 (D + E)</b>					<b>81.370</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.20  
 Macam pekerjaan : Geotextile, Medium thickness (> 400 to < 800 gr), Manual  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 38.590

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0,0160	91.259	1.460
2.	Tukang	L. 02	orang/hari	0,0032	91.259	292
3.	Mandor	L. 13	orang/hari	0,0016	100.000	160
<b>Jumlah Harga Tenaga Kerja</b>						<b>1.912</b>
<b>B</b>	<b>Bahan</b>					
1.	Geotextile Non Woven 500gr	M. 22	m2	1,140	29.100	33.174
<b>Jumlah Harga Bahan</b>						<b>33.174</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>35.086</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>3.509</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m2 (D + E)</b>					<b>38.590</b>

**ANALISA PRODUKSIALAT**

Jenis Pekerjaan : Beton  
 Satuan Pembayaran : m3

No.	Uraian	Kode	Koefisien	Satuan	Keterangan
<b>I</b>	<b>ASUMSI</b>				
1	Jam Kerja Efektif per Hari	Tk	7,00	Jam	
2	Penggunaan loader untuk pengisian silo semen, pasir agregat				
3	Jarak angkut antara 35 m sampai 50 m (maksimum)				
4	Berat isi estimasi untuk :				
	a PC	PC	1,28	ton/m <sup>3</sup>	
	b Pasir Beton	PB	1,37	ton/m <sup>3</sup>	
	c.Pasir	Ps	1,25	ton/m <sup>3</sup>	
	d Kerikil Beton	KB	1,26	ton/m <sup>3</sup>	
	e Tanah	T	1,16	ton/m <sup>3</sup>	
<b>II</b>	<b>URUTAN KERJA</b>				
1	Wheel Loader memuat Semen, Pasir dan Agregat ke Conveyor Silo Batching Plant (BP) beton				
2	BP mencampur, mengaduk dan menuangkan campuran beton ke Truck Mixer yang kemudian diangkut ke Lokasi Pekerjaan				
3	Di lokasi pekerjaan campuran beton dimasukkan ke Pompa Beton yang dipompakan ke lokasi pengecoran pada jarak horizontal 100 m atau sampai ketinggian 50 m pakai pompa beton Pemadatan beton menggunakan vibrator beton dan finishing elevasi permukaan beton dibantu tenaga kerja T + P				
<b>III</b>	<b>PERHITUNGAN</b>				
<b>A</b>	<b>ALAT</b>				
<b>1</b>	<b>Wheel Loader, 1.0-1.6 m3</b>				
	Kapasitas bucket	V	1,62	m3	
	Faktor bucket	Fb	1,00		kondisi mudah
	Faktor efisiensi alat	Fa	0,83		kondisi baik sekali
	Waktu Siklus :				
	- Waktu tetap (Z) = Waktu mengisi + putar + menumpuk	T.1	0,55	menit	V-Loading
	- Waktu mengisi material Bahan baku campuran beton dari SP	T.2	0,35	menit	
	- Waktu Variabel				
	- Mundur Kosong = 1 x 10 m / 15 km/jam	T.4	0,04	menit	kembali ke posisi semula
	- Maju Kosong = 1 x 25 m / 15 km/jam	T.5	0,10	menit	
	- Mundur Isi = 1 x 10 m / 15 km/jam	T.6	0,06	menit	
	- Maju Isi = 1 x 10 m / 15 km/jam	T.7	0,15	menit	
		Ts.1	1,25	menit	
	Kapasitas Produksi / jam = $\frac{(V \times Fa \times 60)}{Ts}$	Q1	64,54	m3/jam	
	Koefisien alat/m3 = (1 : Q1)		0,0155	jam	
<b>2</b>	<b>Batching Plant, 60 m3/jam</b>				
	Kapasitas produksi alat	V	60,00	m3	
	Faktor Efisiensi alat	Fa	0,83		
	Kapasitas Produksi / jam = V x Fa	Q2	49,80	m3/jam	
	Koefisien alat/m3 = (1 : Q2)		0,0201	jam	
<b>3</b>	<b>Agitator Truck, 8 m3</b>				
	Kapasitas mixer	V	8,00	m3	
	Faktor Efisiensi alat	Fa	0,83		
	Jarak batching plant - lokasi	L	2,00	km	
	Kecepatan rata-rata isi	v1	20,00	km/jam	
	Kecepatan rata-rata kosong	v2	30,00	km/jam	
	Waktu siklus	Ts			
	- Waktu antri =	T1	5,00	menit	
	- Waktu muat = (V : Q2) x 60	T2	9,64	menit	
	- Waktu tempuh isi = (L : v1) x 60	T3	6,00	menit	
	- Waktu tempuh kosong = (L : v2) x 60	T4	4,00	menit	
	- Waktu Doking menuangkan ke pompa beton	T5	8,00	menit	
		Ts.2	32,64	menit	
	Kapasitas Produksi / jam = $\frac{(V \times Fa \times 60)}{Ts.2}$	Q3	12,21	m3/jam	

	Koefisien alat/m3 = (1 : Q3)		<b>0,0819</b>	jam
<b>4</b>	<b>Concrete Pump Trailer, 60 m3/jam</b>			
	Kapasitas alat	V	<b>60,00</b>	m3
	Faktor efisiensi alat	Fa	<b>0,83</b>	
	Kapasitas Produksi / jam = V x Fa	Q4	<b>49,80</b>	m3
	Koefisien alat/m3 = sil		<b>0,0201</b>	jam
<b>5</b>	<b>Concrete Vibrator</b>			
	Kapasitas alat	Cp	<b>6,50</b>	m3/jam
	Faktor efisiensi alat	Fa	<b>0,83</b>	
	Kapasitas Produksi / jam = Cp x Fa	Q5	<b>5,40</b>	m3
	Koefisien alat/m3		<b>0,1854</b>	jam
<b>B</b>	<b>TENAGA</b>			
	<b>Produksi : Batching Plant, 60 m3/jam</b>	Q2	<b>49,80</b>	m3/jam
	Produksi / hari			
	Kebutuhan tenaga :			
	- Pekerja	P	<b>3,00</b>	orang
	- Mandor	M	<b>1,00</b>	orang
	Koefisien :			
	- Pekerja = (Tk x P) : Q2		<b>0,4217</b>	jam
	- Mandor = (Tk x M) : Q2		<b>0,0422</b>	jam
	<b>Produksi : Concrete Pump Trailer</b>	Q4	<b>49,80</b>	m3/jam
	Produksi / hari			
	Kebutuhan tenaga :			
	- Pekerja	P	<b>2,00</b>	orang
	- Tukang	T	<b>1,00</b>	orang
	- Mandor	M	<b>1,00</b>	orang
	Koefisien :			
	- Pekerja = (Tk x P) : Q4		<b>0,2811</b>	jam
	- Tukang = (Tk x T) : Q4		<b>0,1406</b>	jam
	- Mandor = (Tk x M) : Q4		<b>0,02811</b>	jam

**LAMPIRAN**  
**REKAPITULASI ANALISIS HARGA SATUAN PEKERJAAN**  
**( A H S P )**

<b>No. Analisis</b>	<b>Uraian Pekerjaan</b>	<b>Satuan</b>	<b>Harga Satuan (Rp)</b>	<b>Referensi</b>
<b>G</b>	<b>MAINTENANCE WORK &amp; FINISHING</b>			
G.01	Irregular Riprap, Less Dense-Many Cavities, Height Difference 0-1 m & Mechanical Tidying	m3	333.600	
G.02	Aanstamping for building construction	m3	515.790	
G.03	Painting 2 m2 of new wall (1 layer of plaster, 1 layer of base coat, 2	m2	43.800	

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : G.01  
 Macam pekerjaan : Irregular Riprap, Less Dense-Many Cavities, Height Difference 0-1 m & Mechanical Tidying  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 333.600

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0,0325	13.037	424
2.	Tukang batu	L. 03	orang/jam	0,0163	13.037	212
3.	Mandor	L. 13	orang/jam	0,0033	14.286	46
<b>Jumlah Harga Tenaga Kerja</b>						<b>683</b>
<b>B</b>	<b>Bahan</b>					
1.	Batu Kali	M. 8	m3	1,200	240.000	288.000
<b>Jumlah Harga Bahan</b>						<b>288.000</b>
<b>C</b>	<b>Peralatan</b>					
1.	Excavator, 150-135 HP	E. 09	jam	0,016	897.200	14.593
<b>Jumlah Harga Peralatan</b>						<b>14.593</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>303.276</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>30.328</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m3 (D + E)</b>					<b>333.600</b>

**ANALISA PRODUKSIALAT**

**Jenis Pekerjaan : Finishing /Perapihan**

No.	Uraian	Kode	Koefisien	Satuan	Keterangan
<b>I</b>	<b>ASUMSI</b>				
1.	Waktu jam kerja efektif	Tk	7,00	jam	
2.	Faktor konversi volume	Fk	1,70		Batuan Keras
<b>II</b>	<b>URUTAN KERJA</b>				
1.	Pembentukan profil dan perapihan (paprasan) oleh Excavator				
2.	Sisa pemotongan dibuang bebas				
3.	Penataan dan Perapihan batuan boulder oleh Exca				
<b>III</b>	<b>PERHITUNGAN</b>				
<b>1.</b>	<b>BAHAN :</b>				
	Tidak ada bahan yang diperlukan				
<b>2.</b>	<b>ALAT :</b>				
	<b>Excavator, 150-135 HP</b>				
	Kapasitas Bucket	V	0,80	m3	
	Faktor Bucket	Fb	1,00	-	kondisi sedang
	Faktor efisien alat	Fa	0,83	-	kondisi baik
	Faktor konversi galian	Fv	0,90	-	Normal
	Faktor konversi bahan (asli-lepas)	Fk	1,00	-	Pasir asli
	Waktu siklus	Ts			
	- Waktu memotong sesuai profil melintang	T1	0,55		
	- Waktu mengangkat kembali	T2	0,17	menit	Ringan, 180°, DT
		Ts	0,72	menit	
	Kapasitas Produksi / jam = $(V \times Fb \times Fa \times 60) / (Ts \times Fk \times Fv)$	Q1	61,48	m3	
	Koefisien alat / m3 = $(1 : Q1)$		0,0163	jam	
<b>3.</b>	<b>TENAGA :</b>				
	<b>Produksi menentukan : Excavator</b>				
	Produksi / hari = $Tk \times Q1$	Q1	61,48	m3/jam	
	Kebutuhan tenaga :	Qt	430,37	m3/jam	
	- Mandor	M	1,00		
	- Pekerja	P	2,00		
	- Tukang	T	1,00		
	Koefisien :				
	- Mandor = $(Tk \times M) : Qt$		0,0033	jam	
	- Pekerja = $(Tk \times P) : Qt$		0,0325	jam	
	- Tukang = $(Tk \times T) : Qt$		0,0163	jam	

**LAMPIRAN**  
**REKAPITULASIANALISIS HARGA SATUAN PEKERJAAN**  
**( A H S P )**

No. Analisis	Uraian Pekerjaan	Satuan	Harga Satuan (Rp)
<b>H</b>	<b>OTHER WORKS</b>		
H.01	Weep Hole	m	44.360
H.02	Dowel Bar	buah	58.960
H.03	Box Culvert 100 x 100 x 120 cm	Buah	4.519.670
H.04	U-Ditch 50 x 60 x 120 cm	Buah	982.920
H.05	Guidepost	Buah	144.760

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : H.01  
 Macam pekerjaan : Weep Hole  
 Kuantitas pekerjaan : 1 m  
 Satuan pengukuran : m  
 Harga Satuan : Rp 44.360

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0,0100	91.259	913
2.	Mandor	L. 13	orang/hari	0,0010	100.000	100
<b>Jumlah Harga Tenaga Kerja</b>						<b>1.013</b>
<b>B</b>	<b>Bahan</b>					
1.	Pipa PVC dia. 2"	M. 59	m'	1,0500	22.285	23.399
2.	Ijuk	M. 25	kg	0,6774	13.390	9.070
3.	Kerikil Beton	M. 35	m3	0,0236	290.000	6.844
<b>Jumlah Harga Bahan</b>						<b>39.314</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>40.326</b>
<b>E</b>	<b>Overhead &amp; Profit (10%<math>\times</math> D)</b>					<b>4.033</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m (D + E)</b>					<b>44.360</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : H.02  
 Macam pekerjaan : Dowel Bar  
 Kuantitas pekerjaan : 1 buah  
 Satuan pengukuran : buah  
 Harga Satuan : Rp 58.960

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	1,3554	13.037	17.671
2.	Mandor	L. 13	orang/jam	0,1355	14.286	1.936
<b>Jumlah Harga Tenaga Kerja</b>						<b>19.607</b>
<b>B</b>	<b>Bahan</b>					
1.	Besi Dowel	M. 13	Kg	2,8443	11.950	33.990
2.	Semen Grouting (Epoxy)	M. 72	liter	0,7300	-	-
<b>Jumlah Harga Bahan</b>						<b>33.990</b>
<b>C</b>	<b>Peralatan</b>					
1.	Drilling Machine 3,32 HP, (Dia. 20-50 mm)	E. 07	jam	0,0904	-	-
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>53.597</b>
<b>E</b>	<b>Overhead &amp; Profit (10%x D)</b>					<b>5.360</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - buah (D + E)</b>					<b>58.960</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : H.03  
 Macam pekerjaan : Box Culvert 100 x 100 x 120 cm  
 Kuantitas pekerjaan : 1 Buah  
 Satuan pengukuran : Buah  
 Harga Satuan : Rp 4.519.670

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	2,9518	13.037	38.483
2.	Tukang	L. 02	orang/jam	1,4759	13.037	19.241
3.	Mandor	L. 13	orang/jam	0,2952	14.286	4.217
<b>Jumlah Harga Tenaga Kerja</b>						<b>61.941</b>
<b>B</b>	<b>Bahan</b>					
1.	Box Culvert 100.100.120	M. 14	Buah	1,0000	3.584.892	3.584.892
2.	Concrete Making and Casting f <sub>c</sub> ' = 10 Mpa (K 125) Mechanical Transported radius 2000 m	F.05	m3	0,3180	986.860	313.821
3.	Pasir Urug	M. 49	m3	0,1104	160.000	17.664
<b>Jumlah Harga Bahan</b>						<b>3.916.377</b>
<b>C</b>	<b>Peralatan</b>					
1.	Crane Truck Hydraulic	E. 06	jam	0,2108	618.800	130.470
<b>Jumlah Harga Peralatan</b>						<b>130.470</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>4.108.788</b>
<b>E</b>	<b>Overhead &amp; Profit (10%x D)</b>					<b>410.879</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - Buah (D + E)</b>					<b>4.519.670</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : H.04  
 Macam pekerjaan : U-Ditch 50 x 60 x 120 cm  
 Kuantitas pekerjaan : 1 Buah  
 Satuan pengukuran : Buah  
 Harga Satuan : Rp 982.920

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0,1986	13.037	2.589
2.	Tukang	L. 02	orang/jam	0,1986	13.037	2.589
3.	Mandor	L. 13	orang/jam	0,0099	14.286	141
<b>Jumlah Harga Tenaga Kerja</b>						<b>5.320</b>
<b>B</b>	<b>Bahan</b>					
1.	U-Ditch 50 x 60 x 120, t = 6,00 cm	M. 87	Buah	0,8333	856.509	713.729
2.	Concrete Making and Casting f <sub>c</sub> ' = 10 Mpa (K 125) Mechanical Transported radius 2000 m	F.05	m3	0,0395	986.860	38.981
3.	Pasir Urug	M. 49	m3	0,0790	160.000	12.640
<b>Jumlah Harga Bahan</b>						<b>765.350</b>
<b>C</b>	<b>Peralatan</b>					
1.	Crane Truck Hydraulic	E. 06	jam	0,1986	618.800	122.894
<b>Jumlah Harga Peralatan</b>						<b>122.894</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>893.564</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>89.356</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - Buah (D + E)</b>					<b>982.920</b>

**LAMPRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : H.05  
 Macam pekerjaan : Guidepost  
 Kuantitas pekerjaan : 1 Buah  
 Satuan pengukuran : Buah  
 Harga Satuan : Rp 144.760

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0,1750	13.037	2.281
2.	Tukang	L. 02	orang/jam	-	13.037	-
3.	Mandor	L. 13	orang/jam	0,0175	14.286	250
<b>Jumlah Harga Tenaga Kerja</b>						<b>2.531</b>
<b>B</b>	<b>Bahan</b>					
1.	Concrete Making and Casting $f_c' = 20$ Mpa (K 225) Mechanically Transported within a radius of 100 m	F.02	m3	0,0236	1.123.910	26.552
2.	Besi Beton Polos	M. 11	kg	4,2820	11.950	51.170
3.	Cat Tembok Penutup	M. 17	kg	0,1800	86.000	15.480
<b>Jumlah Harga Bahan</b>						<b>93.202</b>
<b>C</b>	<b>Peralatan</b>					
1.	Dump Truck, 7 ton	E. 08	jam	0,0901	398.300	35.867
<b>Jumlah Harga Peralatan</b>						<b>35.867</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>131.601</b>
<b>E</b>	<b>Overhead &amp; Profit (10%x D)</b>					<b>13.160</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - Buah (D + E)</b>					<b>144.760</b>

**ANALISA PRODUKSIALAT**

Jenis Pekerjaan : Patok pengarah  
 Satuan Pembayaran : Buah

No.	Uraian	Kode	Koefisien	Satuan	Keterangan
<b>I</b>	<b>ASUMSI</b>				
1	Menggunakan cara manual				
2	Lokasi Pekerjaan : Sepanjang Jalan				
3	Bahan Dasar (patok beton cetak, dll) diangkut dengan truk ke lokasi pekerjaan				
4	Jarak rata-rata Base Camp ke lokasi pekerjaan	L	3,000		
5	Jam kerja efektif per-hari	Tk	7,000		
6	Faktor kehilangan bahan	Fh	1,050		
7	Tulangan praktis	Rc	125,00		
	Kadar Cat		0,280		
<b>II</b>	<b>URUTAN KERJA</b>				
1	Patok ditanam di tepi luar bahy jalan sesuai dengan gambar rencana dan di cat				
<b>III</b>	<b>PERHITUNGAN</b>				
<b>A</b>	<b>BAHAN</b>				
	Beton Fc' 20 Mpa = ( 0,15 x 0,15 x 1,00) x Fh		0,0236	m <sup>3</sup>	
	Baja Tulangan =		4,28	Kg	
	Cat = ( 0,15 x 0,60 x 2,00)		0,18	m <sup>2</sup>	
<b>B</b>	<b>ALAT</b>				
<b>1</b>	<b>Dump Truck, 3.5 ton</b>				
	Kapasitas 1 Kali Angkut	Cp	20,00	Buah	
	Faktor Efisiensi Alat	Fa	0,83		
	Waktu siklus				
	- Waktu memuat = atur, ikat, dll	T1	20,00	menit	
	- Waktu Angkut = ( 2 x L : 25 km/jam) x 60 menit	T2	48,24	menit	
	- Waktu Menurunkan = Rata-rata 1 menit / buah	T3	20,00	menit	
	- Lain-lain = Geser, Atur & tunggu	T4	1,45	menit	
		Ts.1	89,69	menit	
	Kap. Produksi / Jam $\frac{Cp \times Fa}{Ts : 60}$	Q1	11,10	Buah	
	Koefisien Alat / Buah 1 / Q1		0,0901	Jam	
<b>2</b>	Alat Bantu				
	- Pacul, Sekop & Linggis = 4 Buah		1,00	Ls	
	- Kereta Dorong = 1 Buah				
<b>C</b>	<b>TENAGA</b>				
	Produksi Pasang Patok Pengarah / Hari	Q1	11,10	buah/jam	
	Produksi / Hari	Qt	80,00	buah	
	Kebutuhan tenaga :				
	- Pekerja	P	2,00	orang	
	- Mandor	M	1,00	orang	
	Koefisien Tenaga / ton :				
	- Pekerja = (Tk x P) : Qt		0,1750	hari	
	0 = (Tk x T) : Qt		-	hari	
	- Mandor = (Tk x M) : Qt		0,0175	hari	

**ANALISA PRODUKSIALAT**

Jenis Pekerjaan : Pemasangan Box Culvert 100x100x120  
 Satuan Pembayaran : Buah

No.	Uraian	Kode	Koefisien	Satuan	Keterangan
<b>I</b>	<b>ASUMSI</b>				
1	Box culvert, Crane sudah siap di lokasi pekerjaan				
2	Jam Kerja Efektif per-hari	Tk	7,00	jam	
3	Tinggi crane termasuk hoist sudah memenuhi beban yang akan diangkat dan tinggi bebas yang diperlukan saat pelaksanaan				
4	Lokasi crane dapat menjangkau Box Culvert s/d lokasi pemasangan				
5	Posisi crane akan mudah berpindah untuk pelaksanaan pekerjaan				
6	Kehilangan waktu selama pemasangan alat sebelum dan sesudah pelaksanaan pekerjaan dimasukkan dalam masing-masing				
<b>II</b>	<b>URUTAN KERJA</b>				
1	Penempatan Crane dan Box Culvert di Lokasi Pemasangan				
2	Pemasangan kabel slink pada box culvert				
3	Crane mengangkat, swing dan penempatan Box Culvert sesuai rencana				
4	Setting posisi Box Culvert sampai pas posisi				
5	Jika pemasangan belum mencapai panjang design atau sesuai desain lanjutkan ke langkah No. 2 sampai Selesai				
<b>III</b>	<b>PERHITUNGAN</b>				
<b>A</b>	<b>BAHAN</b>				
<b>B</b>	<b>ALAT</b>				
1	<b>Crane Truck Hydraulic, 15 ton</b>				
	Kapasitas per-jam (kontinyu)	V	1,00	buah/jam	
	Faktor efisiensi alat	Fa	0,83		
	Waktu siklus setiap pemasangan				
	- Waktu pemasangan kabel slink pada Box Culvert	T1	7,00	menit	
	- Waktu diangkat, Swing 90 <sup>o</sup> , dan Penempatan	T2	2,50	menit	
	- Waktu swing balik, stand by untuk pemasangan berikutnya sambil lepas kabel slink	T3	1,00	menit	
		Ts.1	10,50	menit	
	Kap. Produksi / Jam	$\frac{V \times Fa \times 60}{Ts}$	4,74	buah/jam	
	Koefisien Alat / Buah	1 / Q1	0,2108	buah/jam	
<b>C</b>	<b>TENAGA</b>				
	Produksi Crane Truck Hydraulic, 15 ton	Q1	4,74	buah/jam	
	Produksi / Hari	Qt	40,00	buah	
	Kebutuhan tenaga :				
	- Pekerja	P	2,00	orang	
	- Tukang	T	1,00	orang	
	- Mandor	M	1,00	orang	
	Koefisien Tenaga / ton :				
	- Pekerja	= (Tk x P) : Qt	2,9518	hari	
	- Tukang	= (Tk x T) : Qt	1,4759	hari	
	- Mandor	= (Tk x M) : Qt	0,2952	hari	

**ANALISA PRODUKSIALAT**

Jenis Pekerjaan : Pemasangan U-Ditch  
 Satuan Pembayaran : Buah

No.	Uraian	Kode	Koefisien	Satuan	Keterangan
<b>I</b>	<b>ASUMSI</b>				
1	U-Ditch, Crane sudah siap di lokasi pekerjaan				
2	Jam Kerja Efektif per-hari	Tk	7,00	jam	
3	Tinggi Crane termasuk hoist pemegang pile driver sudah memenuhi beban yang akan diangkat dan tinggi bebas yang diperlukan saat pelaksanaan pekerjaan dimasukkan dalam masing-masing				
4	Lokasi crane dapat menjangkau U-Ditch s/d lokasi pemasangan				
5	Posisi crane akan mudah berpindah untuk pelaksanaan pekerjaan				
6	Kehilangan waktu selama pemasangan alat sebelum dan sesudah pelaksanaan pekerjaan dimasukkan dalam masing-masing				
<b>II</b>	<b>URUTAN KERJA</b>				
1	Penempatan Crane dan U-Ditch di Lokasi Pemasangan				
2	Pemasangan kabel slink pada U-ditch				
3	Crane mengangkat, swing dan penempatan U-ditch sesuai rencana				
4	Setting posisi U-Ditch sampai pas posisi				
5	Jika pemasangan belum mencapai panjang design atau sesuai desain lanjutkan ke langkah No. 2 sampai Selesai				
<b>III</b>	<b>PERHITUNGAN</b>				
<b>A</b>	<b>BAHAN</b>				
<b>B</b>	<b>ALAT</b>				
1	<b>Crane Truck Hydraulic, 15 ton</b>				
	Kapasitas per-jam (kontinyu)	V	1,00	buah/jam	
	Faktor efisiensi alat	Fa	0,83		
	Waktu siklus setiap pemasangan				
	- Waktu pemasangan kabel slink pada U-Ditch	T1	2,00	menit	
	- Waktu diangkat, Swing 90 <sup>o</sup> , dan Penempatan	T2	0,85	menit	
	- Waktu swing balik, stand by untuk pemasangan berikutnya sambil lepas kabel slink	T3	1,00	menit	
		Ts.1	3,85	menit	
	Kap. Produksi / Jam	$\frac{V \times Fa \times 60}{Ts}$	Q1	12,94	buah/jam
	Koefisien Alat / Buah	1 / Q1		0,0773	buah/jam
<b>C</b>	<b>TENAGA</b>				
	Produksi Crane Truck Hydraulic, 15 ton	Q1	12,94	buah/jam	
	Produksi / Hari	Qt	100,00	buah	
	Kebutuhan tenaga :				
	- Pekerja	P	2,00	orang	
	- Tukang	T	1,00	orang	
	- Mandor	M	1,00	orang	
	Koefisien Tenaga / ton :				
	- Pekerja	= (Tk x P) : Qt		0,1400	hari
	- Tukang	= (Tk x T) : Qt		0,0700	hari
	- Mandor	= (Tk x M) : Qt		0,0140	hari

**ANALISA PRODUKSIALAT**

Jenis Pekerjaan : Pemasangan Ruj (Dowel)  
 Satuan Pembayaran : m'

No.	Uraian	Kode	Koefisien	Satuan	Keterangan
<b>I</b>	<b>ASUMSI</b>				
1	Menggunakan alat berat (cara mekanik)				
2	Lokasi pekerjaan = Sepanjang Jalan				
3	Kondisi existing jalan = Sedang				
4	Jarak rata-rata Base Camp ke lokasi pekerjaan	L	1,000	km	
5	Jam kerja efektif per-hari	Tk	7,000	Jam	
6	Ukuran Lubang Tambalan				
	- Panjang Tambalan	Pjs	2,400	m	
	- Lebar Tambalan	Lbr	3,500	m	
	- Kedalaman Tambalan	Tg	0,300	m	
	- Volume Lubang	V. Lub	2,52	m3	
7	Dowel (mm) 32-450		6,32	Kg/m	
	Dia. Lubang Dowel	Dia. Lub	34,00	mm	
8	Berat Isi bahan - Sealant	D2	1,030	ton/m3	
9	Faktor Kehilangan Bahan	Fh	1,03	km	
<b>II</b>	<b>URUTAN KERJA</b>				
1	Penyiapan lubang untuk dowel untuk sambungan lama dan baru				
2	Pemasangan 1/2 panjang dowel dilanjutkan dengan grouting				
<b>III</b>	<b>PEMAKAIAN BAHAN, ALAT &amp; TENAGA</b>				
<b>A</b>	<b>BAHAN</b>				
1	Setiap dowel memerlukan =	n	10,80	Buah	
	Berat 1 Dowel = $((1/4 \times 22/7) \times \text{Dia. Dwl}^2) \times (\text{P. Dwl} \times 7856)$	Br	2,84	Kg	
	Bahan Grout Semen = $(22/7 \times 0,25) \times (\text{Dia. Lub}^2) \times (\text{P. Dwl})/2 \times \text{D2}$ (Bahan Epoxy)	Grout	0,73	lite r	
<b>B</b>	<b>ALAT</b>				
1	<b>Drilling Machine 3,32 HP, (Dia. 20-50 mm)</b>				
	Kapasitas pengeboran per jam	V	6,00	m/jam	
	Faktor efisiensi alat	Fa	0,83		
	Kapasitas Produksi / jam = $V \times \text{Fa} / 0,45$	Q1	11,07	Lubang	
	Koefisien alat / m' = $(1 : \text{Q1})$		<b>0,0904</b>	jam	
2	<b>Alat bantu</b>				
	- Pahat Manual				
	- Sekop				
	- Kuas				
	- Alat Suntik Grout (Tabung Flexible dengan Nozzel)				
<b>C</b>	<b>TENAGA</b>				
	Produksi Drilling Machine	Q1	11,07	Lubang	
	Produksi / hari = $\text{Tk} \times \text{Q1}$	Qt	77,47	Lubang/Hari	
	Kebutuhan tenaga :				
	- Pekerja	P	15,00	orang	
	- Mandor	M	1,00	orang	
	Koefisien Tenaga / ton :				
	- Pekerja = $(\text{Tk} \times \text{P}) / \text{Qt}$		<b>1,3554</b>		
	- Mandor = $(\text{Tk} \times \text{M}) / \text{Qt}$		<b>0,1355</b>		

卷末資料 6-2-2 積算(S4)



**MINISTRY OF PUBLIC WORKS AND HOUSING  
DIRECTORATE GENERAL OF WATER RESOURCES  
DIRECTORATE OF RIVER AND COAST  
RIVER BASIN ORGANIZATION FOR BRANTAS**

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**THE PROJECT FOR  
CAPACITY DEVELOPMENT OF MT. SEMERU  
VOLCANIC DISASTER MEASURES PLANNING**

**SUB-PROJECT PACKAGE S4  
TANGGUL PENGARAH HULU LEPRAK, TANGGUL  
LEPRAK 26-22, TANGGUL LEPRAK II D, TANGGUL  
KEBONDELI XVII 2021, KD LEPRAK 3, DD LEPRAK 2, DD  
LEPRAK 3, EMERGENCY DIKE**

**DRAFT ENGINEERING ESTIMATE**

**JICA Project Team**

*August 2024*

**SUMMARY OF  
ENGINEERING ESTIMATE COST**

**BALAI BESAR** : BALAI BESAR WILAYAH SUNGAI BRANTAS  
**SATUAN KERJA** : PELAKSANAAN JARINGAN SUMBER AIR BRANTAS  
**PPK** : SUNGAI DAN PANTAI  
**PEKERJAAN** : VOLCANIC DISASTER RISK REDUCTION SECTOR LOAN PROJECT - PACKAGE S4  
**LOKASI PEKERJAAN** : KABUPATEN LUMAJANG  
**TAHUN ANGGARAN** : 2024-2026

NO.	WORK ITEMS	TOTAL PRICE (Rp)	BOBOT (%)
I	PREPARATION WORKS	1,830,158,000	0.64%
II	IMPLEMENTATION OF CONSTRUCTION SAFETY MANAGEMENT SYSTEM (SMKK)	1,874,927,000	0.66%
III	DIKE LEPRAK UPPER DIVERSION	13,419,939,844	4.71%
IV	DIKE LEPRAK 26	39,411,503,961	13.82%
V	DIKE LEPRAK 25	30,721,494,766	10.77%
VI	DIKE LEPRAK 24	28,766,028,846	10.09%
VII	DIKE LEPRAK 23	27,235,354,049	9.55%
VIII	KD LEPRAK 3	16,702,611,171	5.86%
IX	DIKE LEPRAK XVII KEBONDELI 2021	27,819,383,564	9.76%
X	DIKE LEPRAK 22	17,551,997,903	6.16%
XI	DIKE LEPRAK II-D	15,756,346,579	5.53%
XII	EMERGENCY DIKE	7,559,452,243	2.65%
XIII	DD LEPRAK 2	29,838,675,459	10.46%
XIV	DD LEPRAK 3	26,659,624,880	9.35%
	Sub Total (Construction Cost)	285,147,498,265	100%
	Rounded corners right	285,147,400,000	

**SUMMARY OF WORK ITEM  
ENGINEERING ESTIMATE COST**

**BALAI BESAR  
SATUAN KERJA  
PPK  
PEKERJAAN  
LOKASI PEKERJAAN  
TAHUN ANGGARAN**

**BALAI BESAR WILAYAH SUNGAI BRANTAS  
PELAKSANA JARINGAN SUMBER AIR BRANTAS  
SUNGAIDAN PANTAI 1  
VOLCANIC DISASTER RISK REDUCTION SECTOR LOAN PROJECT - PACKAGE S4  
KABUPATEN LUMAJANG  
2024 - 2026**

NO.	WORK ITEMS	TOTAL COST (Rp.)	BOBOT (%)	REMAKS
<b>I</b>	<b>PREPARATION WORKS</b>	<b>1,830,158,000</b>	<b>0.64</b>	
<b>II</b>	<b>IMPLEMENTATION OF CONSTRUCTION SAFETY MANAGEMENT SYSTEM (SMKK)</b>	<b>1,874,927,000</b>	<b>0.66</b>	
<b>III</b>	<b>DIKE LEPRAK UPPER DIMENSION</b>			
A	EARTHWORKS	180,754,708	0.06	
B	CONCRETE WORK	13,239,185,136	4.64	
<b>IV</b>	<b>DIKE LEPRAK 26</b>			
A	EARTHWORKS	2,590,472,406	0.91	
B	CONCRETE WORK	36,821,031,554	12.91	
	<b>DIKE LEPRAK 25</b>			
A	EARTHWORKS	1,389,604,224	0.49	
B	CONCRETE WORK	29,331,890,541	10.29	
	<b>DIKE LEPRAK 24</b>			
A	EARTHWORKS	1,146,437,947	0.40	
B	CONCRETE WORK	27,619,590,899	9.69	
	<b>DIKE LEPRAK 23</b>			
A	EARTHWORKS	841,379,868	0.30	
B	CONCRETE WORK	26,393,974,181	9.26	
	<b>KD LEPRAK 3</b>			
A	EARTHWORKS	1,114,210,071	0.39	
B	RIVER WATERING & DEWATERING WORK	71,336,520	0.03	
C	CONCRETE WORK	14,910,987,660	5.23	
D	MAINTENANCE WORK & FINISHING	547,787,880	0.19	
	OTHER WORKS	58,289,040	0.02	
	<b>DIKE LEPRAK XVIKEBONDELI2021</b>			
	EARTHWORKS	1,522,613,837	0.53	
	CONCRETE WORK	26,296,769,727	9.22	
	<b>DIKE LEPRAK 22</b>			
	EARTHWORKS	1,791,876,108	0.63	
	CONCRETE WORK	15,760,121,795	5.53	
	<b>DIKE LEPRAK II-D</b>			
	EARTHWORKS	1,226,765,819	0.43	
	CONCRETE WORK	14,529,580,761	5.10	
	<b>EMERGENCY DIKE</b>			
	EARTHWORKS	248,065,834	0.09	
	CONCRETE WORK	7,311,386,409	2.56	
	<b>DD LEPRAK 2</b>			
	EARTHWORKS	4,968,038,736	1.74	
	RIVER WATERING & DEWATERING WORK	564,429,960	0.20	
	CONCRETE WORK	24,269,476,683	8.51	
	OTHER WORKS	36,730,080	0.01	
	<b>DD LEPRAK 3</b>			
	EARTHWORKS	3,374,441,567	1.18	
	RIVER WATERING & DEWATERING WORK	494,137,140	0.17	
	CONCRETE WORK	22,749,125,974	7.98	
	OTHER WORKS	41,920,200	0.01	
	<b>Sub Total (Construction Cost)</b>	<b>285,147,498,265</b>	<b>100.00</b>	
	<b>Rounded corners right</b>	<b>285,147,400,000</b>		

**ENGINEERING ESTIMATE COST**  
**VOLCANIC DISASTER RISK REDUCTION SECTOR LOAN PROJECT - PACKAGE S4**

ANALYSIS CODE	NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE (Rp)	TOTAL (Rp)	SUB TOTAL (Rp.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		<b>I PREPARATION WORKS</b>					<b>1,830,158,000</b>
A.01	1	Mobilization and Demobilization of Construction Equipment	Ls	1.00	1,124,000,000	1,124,000,000	
A.02	2	Project Facilities (Board of Directors)	Ls	1.00	706,158,000	706,158,000	
		<b>SUB TOTAL PREPARATION WORKS</b>					<b>1,830,158,000</b>
		<b>II IMPLEMENTATION OF CONSTRUCTION SAFETY MANAGEMENT SYSTEM (SMKK)</b>					<b>1,874,927,000</b>
B.01	1	Implementation of Construction Safety Management System (SMKK)	Ls	1.00	1,874,927,000	1,874,927,000	
		<b>III DIKE LEPRAK UPPER DIVERSION</b>					<b>13,419,939,844</b>
		<b>A EARTHWORKS</b>					<b>180,754,708</b>
E.01	1	Bowplank Installation	m'	260.00	63,330	16,465,800	
E.02	2	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	5,460.00	20,740	113,240,400	
E.03	3	Excavation Cross Profile	m	218.40	26,120	5,704,608	
E.05	4	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	5,372.50	8,440	45,343,900	
		<b>B CONCRETE WORK</b>					<b>13,239,185,136</b>
F.14	1	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	3,079.13	95,770	294,888,376	
F.17	2	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	3,079.13	4,460	13,732,924	
F.08	3	Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Stone	m3	9,435.29	828,710	7,819,122,491	
F.13	4	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	3,858.86	143,250	552,781,695	
F.15	5	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	6,937.99	96,260	667,851,014	
F.16	6	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	3,858.86	6,680	25,777,185	
F.03	7	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanical Transported radius 2000 m	m3	3,481.80	1,109,990	3,864,757,632	
F.18	8	Construction Joint Filler	m3	3.37	81,370	273,820	
		<b>Sub Total DIKE LEPRAK UPPER DIVERSION</b>					<b>13,419,939,844</b>
		<b>IV DIKE LEPRAK 26</b>					<b>39,411,503,961</b>
		<b>A EARTHWORKS</b>					<b>2,590,472,406</b>
E.01	1	Bowplank Installation	m'	1,200.00	63,330	75,996,000	
E.02	2	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	26,307.77	20,740	545,623,150	
E.03	3	Excavation Cross Profile	m	916.80	26,120	23,946,816	
E.05	4	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	230,439.15	8,440	1,944,906,440	
		<b>B CONCRETE WORK</b>					<b>36,821,031,554</b>
F.14	1	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	7,349.50	95,770	703,861,615	
F.17	2	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	7,349.50	4,460	32,778,770	
F.08	3	Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Stone	m3	9,395.16	828,710	7,785,860,972	
F.13	4	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	24,327.28	143,250	3,484,882,144	
F.15	5	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	31,676.78	96,260	3,049,206,362	
F.16	6	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	24,327.28	6,680	162,506,197	
F.03	7	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanical Transported radius 2000 m	m3	19,075.48	1,109,990	21,173,586,495	
F.19	8	Geotextile, Medium thickness (> 400 to < 800 gr), Manual	m2	11,100.00	38,590	428,349,000	
		<b>Sub Total DIKE LEPRAK 26</b>					<b>39,411,503,961</b>

ANALYSIS CODE	NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE (Rp)	TOTAL (Rp)	SUB TOTAL (Rp.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<b>V</b>	<b>DIKE LEPRAK 25</b>					<b>30,721,494,766</b>
	<b>A</b>	<b>EARTHWORKS</b>					<b>1,389,604,224</b>
E.01	1	Bowplank Installation	m'	996.58	63,330	63,113,411	
E.02	2	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	19,030.50	20,740	394,692,570	
E.03	3	Excavation Cross Profile	m	676.64	26,120	17,673,837	
E.05	4	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	108,308.58	8,440	914,124,406	
	<b>B</b>	<b>CONCRETE WORK</b>					<b>29,331,890,541</b>
F.14	1	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	3,637.50	95,770	348,363,375	
F.17	2	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	3,637.50	4,460	16,223,250	
F.08	3	Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Stone	m3	9,388.90	828,710	7,780,673,247	
F.13	4	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	18,655.50	143,250	2,672,400,375	
F.15	5	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	22,293.00	96,260	2,145,924,180	
F.16	6	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	18,655.50	6,680	124,618,740	
F.03	7	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanical Transported radius 2000 m	m3	14,432.62	1,109,990	16,020,058,324	
F.19	8	Geotextile, Medium thickness (> 400 to < 800 gr), Manual	m2	5,795.00	38,590	223,629,050	
		<b>Sub Total DIKE LEPRAK 25</b>					<b>30,721,494,766</b>
	<b>VI</b>	<b>DIKE LEPRAK 24</b>					<b>28,766,028,846</b>
	<b>A</b>	<b>EARTHWORKS</b>					<b>1,146,437,947</b>
E.01	1	Bowplank Installation	m'	945.40	63,330	59,872,182	
E.02	2	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	16,002.00	20,740	331,881,480	
E.03	3	Excavation Cross Profile	m	708.90	26,120	18,516,468	
E.05	4	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	87,223.68	8,440	736,167,817	
	<b>B</b>	<b>CONCRETE WORK</b>					<b>27,619,590,899</b>
F.14	1	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	7,199.74	95,770	689,519,339	
F.17	2	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	7,199.74	4,460	32,110,852	
F.08	3	Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Stone	m3	9,993.40	828,710	8,281,628,442	
F.13	4	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	15,948.00	143,250	2,284,551,000	
F.15	5	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	23,147.74	96,260	2,228,201,693	
F.16	6	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	15,948.00	6,680	106,532,640	
F.03	7	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanical Transported radius 2000 m	m3	12,336.72	1,109,990	13,693,633,058	
F.19	8	Geotextile, Medium thickness (> 400 to < 800 gr), Manual	m2	7,862.50	38,590	303,413,875	
		<b>Sub Total DIKE LEPRAK 24</b>					<b>28,766,028,846</b>
	<b>VII</b>	<b>DIKE LEPRAK 23</b>					<b>27,235,354,049</b>
	<b>A</b>	<b>EARTHWORKS</b>					<b>841,379,868</b>
E.01	1	Bowplank Installation	m'	650.00	63,330	41,164,500	
E.02	2	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	11,900.00	20,740	246,806,000	
E.03	3	Excavation Cross Profile	m	529.10	26,120	13,820,092	
E.05	4	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	61,579.05	8,440	519,727,214	
E.06	5	Backfill Sand (Material from Excavation, Mechanically)	m3	1,214.06	16,360	19,862,063	

ANALYSIS CODE	NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE (Rp)	TOTAL (Rp)	SUB TOTAL (Rp.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		<b>B CONCRETE WORK</b>					<b>26,393,974,181</b>
F.14	1	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	3,121.60	95,770	298,955,287	
F.17	2	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	3,121.60	4,460	13,922,320	
F.08	3	Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Stone	m3	11,154.98	828,710	9,244,239,332	
F.13	4	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	9,815.25	143,250	1,406,034,563	
F.15	5	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	12,936.85	96,260	1,245,300,834	
F.16	6	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	9,815.25	6,680	65,565,870	
F.03	7	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanical Transported radius 2000 m	m3	9,113.29	1,109,990	10,115,662,876	
F.18	8	Construction Joint Filler	m3	7.70	81,370	626,800	
F.09	9	1 kg Slab reinforcement for BjTP or BjTS diameter > 12 mm Semi-Mechanical method (cutting, bending and fitting)	Kg	198,532.18	15,100	2,997,835,901	
H.06	10	1 kg Achor Bolt	kg	36,134.41	23,030	832,175,398	
F.19	11	Geotextile, Medium thickness (> 400 to < 800 gr), Manual	m2	4,500.00	38,590	173,655,000	
		<b>Sub Total DIKE LEPRAK 23</b>					<b>27,235,354,049</b>
	<b>VIII</b>	<b>KD LEPRAK 3</b>					<b>16,702,611,171</b>
		<b>A EARTHWORKS</b>					<b>1,114,210,071</b>
E.01	1	Bowplank Installation	m'	749.82	63,330	47,485,911	
E.02	2	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	9,218.12	20,740	191,183,900	
E.03	3	Excavation Cross Profile	m	929.59	26,120	24,280,891	
E.05	4	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	71,989.50	8,440	607,591,398	
E.06	5	Backfill Sand (Material from Excavation, Mechanically)	m3	14,894.13	16,360	243,667,972	
		<b>B RIVER WATERING &amp; DEWATERING WORK</b>					<b>71,336,520</b>
E.06	1	Backfill Sand (Material from Excavation, Mechanically)	m3	87.00	16,360	1,423,320	
C.01	2	1 Piece of Sand Geobag Size 145 x 240 cm	Buah	140.00	468,500	65,590,000	
C.02	3	Hourly operation of a 5 KW diesel water pump with a maximum suction head of 3 m and a maximum discharge head of 10 m (capacity 10 L/s at a suction head of 1 m and a discharge head of 10 m)	Jam	70.00	61,760	4,323,200	
		<b>C CONCRETE WORK</b>					<b>14,910,987,660</b>
F.14	1	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	1,844.14	95,770	176,613,003	
F.17	2	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	1,844.14	4,460	8,224,851	
F.08	3	Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Stone	m3	9,869.45	828,710	8,178,909,183	
F.13	4	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	6,796.17	143,250	973,550,822	
F.15	5	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	8,640.30	96,260	831,715,597	
F.16	6	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	6,796.17	6,680	45,398,391	
F.03	7	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanical Transported radius 2000 m	m3	3,056.33	1,109,990	3,392,499,594	
F.01	8	Concrete Making and Casting fc' = 30 Mpa (K 350) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	1,010.85	1,289,590	1,303,579,537	
F.18	9	Construction Joint Filler	m3	6.10	81,370	496,682	
		<b>D MAINTENANCE WORK &amp; FINISHING</b>					<b>547,787,880</b>
G.01	1	Rip-Rap Boulder, Less Dense-Many Cavities, Height Difference 0-1 m & Mechanical Tidving	m3	1,642.05	333,600	547,787,880	
		<b>E OTHER WORKS</b>					<b>58,289,040</b>
H.01	1	Weep Hole	m	1,314.00	44,360	58,289,040	
		<b>Sub Total KD LEPRAK 3</b>					<b>16,702,611,171</b>

ANALYSIS CODE	NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE (Rp)	TOTAL (Rp)	SUB TOTAL (Rp.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<b>IX</b>	<b>DIKE LEPRAK XVII KEBONDELI 2021</b>					<b>27,819,383,564</b>
	<b>A</b>	<b>EARTHWORKS</b>					<b>1,522,613,837</b>
E.01	1	Bowplank Installation	m'	764.36	63,330	48,406,919	
E.02	2	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	25,139.00	20,740	521,382,912	
E.03	3	Excavation Cross Profile	m	366.52	26,120	9,573,502	
E.05	4	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	111,759.54	8,440	943,250,504	
	<b>B</b>	<b>CONCRETE WORK</b>					<b>26,296,769,727</b>
F.14	1	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	3,384.75	95,770	324,157,508	
F.17	2	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	3,384.75	4,460	15,095,985	
F.08	3	Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Stone	m3	7,771.39	828,710	6,440,231,796	
F.13	4	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	18,009.50	143,250	2,579,860,875	
F.15	5	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	21,394.25	96,260	2,059,410,505	
F.16	6	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	18,009.50	6,680	120,303,460	
F.03	7	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanical Transported radius 2000 m	m3	12,779.21	1,109,990	14,184,792,810	
F.19	8	Geotextile, Medium thickness (> 400 to < 800 gr), Manual	m2	14,846.25	38,590	572,916,788	
		<b>Sub Total DIKE LEPRAK XVII KEBONDELI 2021</b>					<b>27,819,383,564</b>
	<b>X</b>	<b>DIKE LEPRAK 22</b>					<b>17,551,997,903</b>
	<b>A</b>	<b>EARTHWORKS</b>					<b>1,791,876,108</b>
E.01	1	Bowplank Installation	m'	632.00	63,330	40,024,560	
E.02	2	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	21,410.29	20,740	444,049,458	
E.03	3	Excavation Cross Profile	m	1,368.00	26,120	35,732,160	
E.05	4	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	147,475.41	8,440	1,244,692,492	
E.06	5	Backfill Sand (Material from Excavation, Mechanically)	m3	1,673.44	16,360	27,377,438	
	<b>B</b>	<b>CONCRETE WORK</b>					<b>15,760,121,795</b>
F.03	1	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanical Transported radius 2000 m	m3	9,039.27	1,109,990	10,033,495,145	
F.08	2	Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Stone	m3	2,406.89	828,710	1,994,617,583	
F.13	3	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	14,205.39	143,250	2,034,921,938	
F.15	4	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	15,399.24	96,260	1,482,330,972	
F.16	5	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	14,205.39	6,680	94,891,997	
F.14	6	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	1,193.85	95,770	114,335,264	
F.17	7	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	1,193.85	4,460	5,324,583	
F.18	8	Construction Joint Filler	m3	2.51	81,370	204,314	
		<b>Sub Total DIKE LEPRAK 22</b>					<b>17,551,997,903</b>
	<b>XI</b>	<b>DIKE LEPRAK II-D</b>					<b>15,756,346,579</b>
	<b>A</b>	<b>EARTHWORKS</b>					<b>1,226,765,819</b>
E.01	1	Bowplank Installation	m'	1,658.86	63,330	105,055,604	
E.02	2	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	21,863.88	20,740	453,456,853	
E.03	3	Excavation Cross Profile	m	1,501.33	26,120	39,214,740	
E.05	4	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	74,530.64	8,440	629,038,623	

ANALYSIS CODE	NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE (Rp)	TOTAL (Rp)	SUB TOTAL (Rp.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		<b>B CONCRETE WORK</b>					<b>14,529,580,761</b>
F.03	1	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanical Transported radius 2000 m	m3	10,372.18	1,109,990	11,513,014,691	
F.13	2	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	12,253.00	143,250	1,755,242,250	
F.15	3	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	12,253.00	96,260	1,179,473,780	
F.16	4	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	12,253.00	6,680	81,850,040	
		<b>Sub Total DIKE LEPRAK I-D</b>					<b>15,756,346,579</b>
		<b>XII EMERGENCY DIKE</b>					<b>7,559,452,243</b>
		<b>A EARTHWORKS</b>					<b>248,065,834</b>
E.01	1	Bowplank Installation	m'	860.32	63,330	54,484,066	
E.02	2	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	3,928.04	20,740	81,467,645	
E.03	3	Excavation Cross Profile	m	174.20	26,120	4,550,104	
E.05	4	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	11,325.35	8,440	95,585,943	
E.06	5	Backfill Sand (Material from Excavation, Mechanically)	m3	732.16	16,360	11,978,076	
		<b>B CONCRETE WORK</b>					<b>7,311,386,409</b>
F.03	1	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanical Transported radius 2000 m	m3	3,845.35	1,109,990	4,268,300,047	
F.08	2	Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Stone	m3	2,062.50	828,710	1,709,214,375	
F.13	3	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	3,725.00	143,250	533,606,250	
F.15	4	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	5,846.30	96,260	562,764,838	
F.16	5	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	3,725.00	6,680	24,883,000	
F.14	6	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	2,121.30	95,770	203,156,901	
F.17	7	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	2,121.30	4,460	9,460,998	
		<b>Sub Total EMERGENCY DIKE</b>					<b>7,559,452,243</b>
		<b>XIII DD LEPRAK 2</b>					<b>29,838,675,459</b>
		<b>A EARTHWORKS</b>					<b>4,968,038,736</b>
E.01	1	Bowplank Installation	m'	852.61	63,330	53,996,045	
E.02	2	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	38,958.53	20,740	807,999,850	
E.03	3	Excavation Cross Profile	m	209.00	26,120	5,459,080	
E.05	4	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	446,876.25	8,440	3,771,635,571	
E.06	5	Backfill Sand (Material from Excavation, Mechanically)	m3	20,106.86	16,360	328,948,191	

ANALYSIS CODE	NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE (Rp)	TOTAL (Rp)	SUB TOTAL (Rp.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		<b>B RIVER WATERING &amp; DEWATERING WORK</b>					<b>564,429,960</b>
E.06	1	Backfill Sand (Material from Excavation, Mechanically)	m3	696.00	16,360	11,386,560	
C.01	2	1 Piece of Sand Geobag Size 145 x 240 cm	Buah	1,162.00	468,500	544,397,000	
C.02	3	Hourly operation of a 5 KW diesel water pump with a maximum suction head of 3 m and a maximum discharge head of 10 m (capacity 10 L/s at a suction head of 1 m and a discharge head of 10 m)	Jam	140.00	61,760	8,646,400	
		<b>C CONCRETE WORK</b>					<b>24,269,476,683</b>
F.03	1	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanical Transported radius 2000 m	m3	17,798.43	1,109,990	19,756,073,766	
F.13	2	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	18,328.23	143,250	2,625,519,050	
F.15	3	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	18,328.23	96,260	1,764,275,489	
F.16	4	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	18,328.23	6,680	122,432,581	
F.18	5	Construction Joint Filler	m3	14.45	81,370	1,175,797	
		<b>D OTHER WORKS</b>					<b>36,730,080</b>
H.01	1	Weep Hole	m	828.00	44,360	36,730,080	
		<b>Sub Total DD LEPRAK 2</b>					<b>29,838,675,459</b>
	<b>XIV</b>	<b>DD LEPRAK 3</b>					<b>26,659,624,880</b>
		<b>A EARTHWORKS</b>					<b>3,374,441,567</b>
E.01	1	Bowplank Installation	m'	1,656.50	63,330	104,906,145	
E.02	2	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	39,456.17	20,740	818,320,966	
E.03	3	Excavation Cross Profile	m	187.00	26,120	4,884,440	
E.05	4	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	288,176.25	8,440	2,432,207,550	
E.06	5	Backfill Sand (Material from Excavation, Mechanically)	m3	863.23	16,360	14,122,466	
		<b>B RIVER WATERING &amp; DEWATERING WORK</b>					<b>494,137,140</b>
E.06	1	Backfill Sand (Material from Excavation, Mechanically)	m3	609.00	16,360	9,963,240	
C.01	2	1 Piece of Sand Geobag Size 145 x 240 cm	Buah	1,015.00	468,500	475,527,500	
C.02	3	Hourly operation of a 5 KW diesel water pump with a maximum suction head of 3 m and a maximum discharge head of 10 m (capacity 10 L/s at a suction head of 1 m and a discharge head of 10 m)	Jam	140.00	61,760	8,646,400	
		<b>C CONCRETE WORK</b>					<b>22,749,125,974</b>
F.03	1	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanical Transported radius 2000 m	m3	18,246.83	1,109,990	20,253,803,439	
F.13	2	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	10,129.81	143,250	1,451,095,254	
F.15	3	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	10,129.81	96,260	975,095,491	
F.16	4	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	10,129.81	6,680	67,667,129	
F.18	5	Construction Joint Filler	m3	18.00	81,370	1,464,660	
		<b>D OTHER WORKS</b>					<b>41,920,200</b>
H.01	1	Weep Hole	m	945.00	44,360	41,920,200	
		<b>Sub Total DD LEPRAK 3</b>					<b>26,659,624,880</b>
<b>GRAND TOTAL CONSTRUCTION COST</b>							<b>285,147,498,265</b>

**SUMMARY OF WORK ANALYSIS OF UNIT PRICE  
(A H S P)**

No. Analisis	Uraian Pekerjaan	Satuan	Harga Satuan (Rp.)	Nomor Permen
<b>A</b>	<b>PREPARATDN WORKS</b>			
A.01	Mobilization and Demobilization of Construction Equipment	Ls	1,124,000,000	ANTEK
A.02	Project Facilities (Board of Directors)	Ls	706,158,000	U.1.3.b
A.03	Pembuatan Direksi Keet (Kantor)	m2	3,330,790	1.1.2.4
A.04	Pasangan 1 m Bouwplank	m'	63,330	U.1.2.1.d (a)
A.05	Stake Out Trase Infrastruktur Baru di Lapangan & Patok Kayu (Kaso 5/7) Panjang 1 m	m2	20,740	U.1.2.1. a. (a)
A.06	pasangan 1 m Profil Melintang Galian	m	26,120	U.1.2.1.b (a)
<b>B</b>	<b>IMPLEMENTATDN OF CONSTRUCTDN SAFETY MANAGEMENT SYSTEM (SMKK)</b>			
B.01	Implementation of Construction Safety Management System (SMKK)	Ls	1,874,927,000	
<b>C</b>	<b>RIVER WATERING &amp; DEWATERING WORK</b>			
C.01	1 Piece of Sand Geobag Size 145 x 240 cm	Buah	468,500	U.2.1.c (a)
C.02	Hourly operation of a 5 KW diesel water pump with a maximum suction head of 3 m and a maximum discharge head of 10 m (capacity 10 L/s at a suction head of 1 m and a discharge head of 10 m)	Jam	61,760	U.2.2.b (a)
<b>D</b>	<b>PEKERJAAN PEMBONGKARAN</b>			
D.01	Demolition with RDB, Loading of Demolition Materials (Rock f > 25 cm) and Transport, (mechanically, transported to the disposal area with a distance of up to 500 m)	m3	53,760	A.3.01.2a.3
<b>E</b>	<b>EARTHWORKS</b>			
E.01	Bowplank Installation	m'	63,330	U.1.2.1.d (a)
E.02	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	20,740	U.1.2.1. a. (a)
E.03	Excavation Cross Profile	m	26,120	U.1.2.1.b (a)
E.04	Mechanical Sand Excavation (transported to disposal area, distance 0 m to 500 m)	m3	19,520	ANTEK
E.05	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	8,440	ANTEK
E.06	Backfill Sand (Material from Excavation, Mechanically)	m3	16,360	ANTEK
<b>F</b>	<b>CONCRETE WORK</b>			
F.01	Concrete Making and Casting f'c = 30 Mpa (K 350) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	1,289,590	ANTEK
F.02	Concrete Making and Casting f'c = 20 Mpa (K 225) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	1,123,910	ANTEK
F.03	Concrete Making and Casting f'c = 20 Mpa (K 225) Mechanical Transported radius 2000 m	m3	1,109,990	ANTEK
F.04	Concrete Making and Casting f'c = 15 Mpa (K 175) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	1,060,070	ANTEK
F.05	Concrete Making and Casting f'c = 10 Mpa (K 125) Mechanical Transported radius 2000 m	m3	986,860	ANTEK
F.06	Manufacturing and Casting of 1 m3 of low quality concrete f'c = 10 Mpa; W/C = 0,700 Semi Mechanical	m3	959,310	A.3.04.1
F.07	Cyclops Concrete 60% Concrete f'c 15 Mpa: 40% Stone, with Concrete Pump (CP)	m3	842,630	ANTEK
F.08	Cyclops Concrete 60% Concrete f'c 15 Mpa: 40% Stone	m3	828,710	U.4.9.c
F.09	1 kg Slab reinforcement for BjTP or BjTS diameter > 12 mm Semi-Mechanical method (cutting, bending and fitting)	Kg	15,100	U.4.6.a.2 (a)
F.10	1 m2 Exposed Formwork for Concrete Floor Slabs with Multiflex 18 mm (TP), JaTm 0.60 m	m2	127,830	A.1.03.2b.2
F.11	1 m2 Regular Concrete Floor Formwork with Multiflex 12 mm or 18 mm (TP)	m2	88,660	A.1.03.2b.1
F.12	1 m2 Concrete Floor Formwork Scaffolding with 5/7 cm Rafters 4.00 m high, JaTm 0.60 m	m2	117,400	A.1.03.2b.4
F.13	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	143,250	A.1.03.2f.2
F.14	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	95,770	A.1.03.2f.1
F.15	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	96,260	A.1.03.2f.4
F.16	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	6,680	A.1.03.2i.2
F.17	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	4,460	A.1.03.2i.1
F.18	Construction Joint Filler	m3	81,370	A.2.02.5d.1
F.19	Geotextile, Medium thickness (> 400 to < 800 gr), Manual	m2	38,590	A.1.02.5b.2
<b>G</b>	<b>MAINTENANCE WORK &amp; FINISHING</b>			
G.01	Rip-Rap Boulder, Less Dense-Many Cavities, Height Difference 0-1 m & Mechanical Tidying	m3	333,600	A.1.02.4a.2.b
G.02	Aanstamping for building construction	m3	515,790	2.2.2.1.1
G.03	1 m2 Plesteran t = 2,00 cm, dengan Mortar Tipe S (12,50 Mpa)	m2	38,590	A.1.02.3b.13
G.04	Painting 2 m2 of new wall (1 layer of plaster, 1 layer of base coat, 2 layers of top coat)	m2	43,070	3.8.10
<b>H</b>	<b>OTHER WORKS</b>			
H.01	Weep Hole	m	44,360	A.2.02.5d.3
H.02	Dowel Bar	buah	58,250	1.29
H.03	Box Culvert 100 x 100 x 120 cm	Buah	4,398,840	A.3.09.2b.3.b
H.04	U-Ditch 50 x 60 x 120 cm	Buah	1,044,960	A.3.09.2a.1.b
H.05	Guidepost	Buah	144,760	O.30
H.06	1 kg Anchor Bolt	kg	23,030	2.3.1.2

1. a.

AHSP menggunakan :  
Permen PUPR No 8 tahun 2023

1	Jam kerja efektif dalam 1 hari	7.00	jam	
2	Jam kerja efektif dalam 1 bulan	25.00	hari	
3	Asuransi, Pajak, dsb. untuk Peralatan	0.20	% x Harga Pokok Alat	
4	Suku bunga (I)	11.00	%	
5	Biaya Umum dan Keuntungan (over head & profit)	10.00	%	Catatan Overhead dikalikan 10% agar Kontraktor tidak membanting harga terlalu jauh
6	Kurs 1 US\$	07-May-24 Rp16,075.00		Sumber : <a href="https://www.bi.go.id/id/statistik/informasi-kurs/transaksi-bi/default.aspx">https://www.bi.go.id/id/statistik/informasi-kurs/transaksi-bi/default.aspx</a>
	1 zak semen	50.00	kg	

Perubahan Permen no 28 tahun 2016 - Permen no 1 tahun 2022  
analisa alat biaya operasi per jam  
koef pekerjaan

**DAFTAR STANDAR HARGA SATUAN DASAR (SHSD)  
UPAH KERJA**

No.	Tenaga Kerja	Kode	Satuan	Upah Kerja (Rp)
1.	Pekerja	L. 01	orang/hari	91,259
2.	Tukang	L. 02	orang/hari	91,259
3.	Tukang Batu	L. 03	orang/hari	91,259
4.	Tukang Besi	L. 04	orang/hari	91,259
5.	Tukang Beton	L. 05	orang/hari	91,259
6.	Tukang Cat	L. 06	orang/hari	91,259
7.	Tukang Kayu	L. 07	orang/hari	91,259
8.	Kepala Tukang	L. 8	orang/hari	95,000
9.	Kepala Tukang Batu	L. 9	orang/hari	95,000
10.	Kepala Tukang Besi	L. 10	orang/hari	95,000
11.	Kepala Tukang Cat	L. 11	orang/hari	95,000
12.	Kepala Tukang Kayu	L. 12	orang/hari	95,000
13.	Mandor	L. 13	orang/hari	100,000
14.	Operator	L. 14	orang/hari	91,259
15.	Operator Alat Berat	L. 15	orang/hari	100,000
16.	Operator Pompa	L. 16	orang/hari	100,000
17.	Assisten Operator	L. 17	orang/hari	91,259
18.	Sopir	L. 18	orang/hari	100,000

**DAFTAR STANDAR HARGA SATUAN DASAR (SHSD)  
BAHAN BANGUNAN**

No.	Jenis Bahan/Material	Kode	Satuan	Harga Satuan (Rp)
1.	Air	M. 01	liter	50
2.	Ampelas/kertas gosok	M. 2	lembar	1,700
3.	APAR (Alat Pemadam Api Ringan)	M. 3	Buah	537,500
4.	Asbes Gelombang	M. 4	lembar	101,000
5.	Bahan Bakar Pertalite (non subsidi)	M. 5	liter	10,000
6.	Bahan Bakar Solar (industri)	M. 6	liter	21,100
7.	Batu Belah	M. 7	m <sup>3</sup>	240,000
8.	Batu Kali	M. 8	m <sup>3</sup>	240,000
9.	Benang Jahit Geotekstil	M. 9	m	12,000
10.	Bendera K3 (Safety Flag)	M. 10	Buah	58,900
11.	Besi Beton Polos	M. 11	kg	11,950
12.	Besi Beton Uilir	M. 12	kg	13,000
13.	Besi Dowel	M. 13	Kg	11,950
14.	Box Culvert 100.100.120	M. 14	Buah	3,584,892
15.	Cat Dinding/Plafon	M. 15	kg	86,000
16.	Cat Tembok Dasar	M. 16	kg	27,000
17.	Cat Tembok Penutup	M. 17	kg	86,000
18.	CCTV Outdoor	M. 18	Unit	1,399,000
19.	Concrete Additive	M. 19	kg	31,000
20.	Frame besi kaca nako	M. 20	daun	550,000
21.	Geotextile Non Woven 200gr	M. 21	m <sup>2</sup>	12,500
22.	Geotextile Non Woven 500gr	M. 22	m <sup>2</sup>	29,100
23.	GRC 6 mm	M. 23	lembar	154,500
24.	Helm Pelindung (Safety Helmet)	M. 24	Buah	51,500
25.	Ijuk	M. 25	kg	13,390
26.	Jaring Pengaman (Safety Net)	M. 26	m	6,130
27.	Jas Hujan (Raincoat)	M. 27	Set	242,000
28.	Joint filler, t = 20 mm	M. 28	m <sup>3</sup>	65,900
29.	Joint sealant	M. 29	kg	33,480

30.	Kaca Bening 5 mm	M. 30	m <sup>2</sup>	221,450
31.	Kaso 4/6 cm	M. 31	m <sup>3</sup>	2,811,900
32.	Kaso 5/7 cm	M. 32	m <sup>3</sup>	2,811,900
33.	Kawat Ikat Beton (Bendrat)	M. 33	kg	21,000
34.	Kayu Dolken	M. 34	batang	29,820
35.	Kerikil Beton	M. 35	m <sup>3</sup>	290,000
36.	Kerucut Lalu Lintas (Rubber Cone)	M. 36	Buah	36,050
37.	Minyak bekisting	M. 37	liter	26,400
38.	Multipleks, 18 mm	M. 38	lembar	207,300
39.	Paku 1 cm - 2,5 cm	M. 39	kg	20,000
40.	Paku 5 cm dan 7 cm	M. 40	kg	20,000
41.	Paku Asbes	M. 41	kg	38,000
42.	Paku Biasa	M. 42	kg	28,000
43.	Paku Payung	M. 43	Buah	6,500
44.	Papan Informasi K3	M. 44	Buah	1,988,600
45.	Papan kayu bekisting	M. 45	m <sup>3</sup>	2,686,000
46.	Papan Kayu Kelas III	M. 46	m <sup>3</sup>	2,595,600
47.	Pasir Beton	M. 47	m <sup>3</sup>	200,000
48.	Pasir Pasang	M. 48	m <sup>3</sup>	200,000
49.	Pasir Urug	M. 49	m <sup>3</sup>	160,000
50.	Pelat Rambu	M. 50	Buah	
51.	Pelindung Jatuh (Fall Arrester)	M. 51	Set	616,000
52.	Pelindung Mata (Goggles, Spectacles)	M. 52	Set	206,000
53.	Pelindung Pernapasan dan Mulut (Masker)	M. 53	Buah	51,500
54.	Pelindung Telinga (Ear Plus, Ear Nuff)	M. 54	Set	51,500
55.	Pelumas	M. 55	liter	42,000
56.	Pembatas Area (Restricted Area)	M. 56	Ls	1,500,000
57.	Pintu double teakwood rangka kayu	M. 57	m <sup>2</sup>	670,000
58.	Penunjang Seluruh Tubuh (Full Body Harne)	M. 58	Buah	103,000
59.	Pipa PVC dia. 2"	M. 59	m'	22,285
60.	Pompa Air Diesel 5 kW, Q = 10 l/s	M. 60	Unit	2,250,000
61.	Poster Proyek	M. 61	Lembar	37,000
62.	Profil kaca	M. 62	m'	75,000
63.	Rambu Informasi	M. 63	Buah	128,750
64.	Rambu Jalur Evakuasi	M. 64	Buah	128,750
65.	Rambu Kewajiban	M. 65	Buah	128,750
66.	Rambu Larangan	M. 66	Buah	128,750
67.	Rambu Pekerjaan Sementara	M. 67	Buah	128,750
68.	Rambu Peringatan	M. 68	Buah	128,750
69.	Rambu Petunjuk	M. 69	Buah	128,750
70.	Rompi Keselamatan (Safety Vest)	M. 70	Buah	154,500
71.	Sarung Tangan (Safety Gloves)	M. 71	Set	5,150
72.	Semen Grouting (Epoxy)	M. 72	liter	38,000
73.	Semen Portland	M. 73	kg	1,523
74.	Semen Portland 50 kg	M. 74	zak	82,000
75.	Seng gelombang	M. 75	lembar	80,000
76.	Sepatu Keselamatan (Safety Shoes)	M. 76	set	257,500
77.	Sewa Lahan	M. 77	Ha - Bulan	1,333,333
78.	Sewa pasir	M. 78	m <sup>3</sup>	56,000
79.	Sirine	M. 79	Set	361,000
80.	Sirtu	M. 80	m <sup>3</sup>	175,000
81.	Spanduk / Banner Proyek	M. 81	Lembar	121,000
82.	Tali Keselamatan (Life Line)	M. 82	m	31,056
83.	Tali rafia/plastik	M. 83	m	60
84.	Tanah Timbunan/urug	M. 84	m <sup>3</sup>	160,000
85.	Tongkat Pengatur Lalu Lintas (Warning Lig	M. 85	Buah	57,000
86.	Triplek, tebal 4 mm	M. 86	lembar	76,100
87.	U-Ditch 50 x 60 x 120, t = 6,00 cm	M. 87	Buah	856,509

**DAFTAR STANDAR HARGA SATUAN DASAR (SHSD)  
PENGUNAAN PERALATAN KONSTRUKSIPER JAM**

No.	Jenis Bahan/Material	Kode	Satuan	Harga Satuan (Rp)
1.	Agitator Truck, 8 m3	E. 01	jam	1,096,000
2.	Batching Plant, 60 m3/jam	E. 02	jam	1,019,600
3.	Bor Listrik (Portable) 300 Watt	E. 03	jam	27,300
4.	Concrete Pump Trailer, 60 m3/jam	E. 04	jam	630,300
5.	Concrete Vibrator	E. 05	jam	54,000
6.	Crane Truck Hydraulic	E. 06	jam	618,800
7.	Drilling Machine 3,32 HP, (Dia. 20-50 mm)	E. 07	jam	38,000
8.	Dump Truck, 7 ton	E. 08	jam	398,300
9.	Excavator, 150-135 HP	E. 09	jam	897,200
10.	Excavator Breaker	E. 010	jam	743,200
11.	Grouting Pump 0,50-1,5 m3/jam, 25 Bar	E. 11	jam	34,200
12.	Diesel Generator, 2 kVA	E. 12	jam	36,200
13.	Mesin Jahit Geotekstil	E. 13	jam	28,200
14.	bar bender	E. 14	Hari	70,000
15.	bar cutter	E. 15	Hari	70,000
16.	Mesin Stamper	E. 16	jam	46,200
17.	Molen, 0.35 m3	E. 17	jam	42,200
18.	Pemotong Kain / Geotekstil	E. 18	jam	27,300
19.	Pompa Air	E. 19	jam	91,000
20.	Tackle / Tripod	E. 20	jam	200,000
21.	Theodolite Digital	E. 21	hari	350,000
22.	Waterpass Digital	E. 22	hari	200,000
23.	Wheel Loader, 1.0-1.6 m3	E. 23	jam	491,000
24.	Alat Bantu	E. 24	jam	1,000
25.	Linggis	E. 25	buah	90,000
26.	Palu Batu (Godam)	E. 26	buah	37,000
27.	Pahat Beton	E. 27	buah	25,000

No	Uraian	Skema	Tempo	Tempo	Tempo	Tempo	Tempo	Tempo	Tempo	Tempo	Tempo	Tempo	Tempo	Tempo	Tempo
<b>A. URAIAN PERALATAN</b>															
1	Aksi Bedakan		Agar@Track Soil@	Bedak@Banc.0	Heri@ank(bedak)	Compass@DD	Garasi@Banc	Cover@Vibrase	Over@Track@Hydrak	Dilling@Kline@32					Damp@Track@7mm
2	MBr@Tyr		00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
3	Bereng		26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000
4	Expansi		8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000
5	Act@Dac		5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
6	Kapasitas@Kard		175000000	338000000	2200000	2200000	2200000	2200000	2200000	2200000	2200000	2200000	2200000	2200000	2200000
<b>B. URAIAN</b>															
1	Traktor@Sik@Beng		1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
2	Upr@C@B@eng@S@ng		1428571	1428571	1428571	1428571	1428571	1428571	1428571	1428571	1428571	1428571	1428571	1428571	1428571
3	Upr@C@B@eng@S@ng		1000000	1000000	1000000	1000000	1000000	1000000	1000000	1000000	1000000	1000000	1000000	1000000	1000000
4	B@n@B@er@S@ar@C@o@v@e@r@B		2100000	2100000	2100000	2100000	2100000	2100000	2100000	2100000	2100000	2100000	2100000	2100000	2100000
5	M@v@e@l@K@am		4200000	4200000	4200000	4200000	4200000	4200000	4200000	4200000	4200000	4200000	4200000	4200000	4200000
6	Av@n@s@p@k@e@l@ar@h@n		020	020	020	020	020	020	020	020	020	020	020	020	020
7	Av@n@s@p@k@e@l@ar@h@n		020	020	020	020	020	020	020	020	020	020	020	020	020
8	IP@S@p@r@k@e@l@ar@h@n		020	020	020	020	020	020	020	020	020	020	020	020	020
<b>C. KAWASIH PERALATAN</b>															
1	Nil@Sk@M@=10%SB		380000000	380000000	2200000	2200000	2200000	2200000	2200000	2200000	2200000	2200000	2200000	2200000	2200000
2	B@w@Ag@n@M@k@l		02706	02706	04482	04482	02706	02706	02706	02706	02706	02706	02706	02706	02706
3	B@h@r@B@ng@l		23340570	41348555	4039	4039	28780113	18000007	10714408	20885007	7326408	0002849			
4	B@n@B@er@B@n@n@M@v@e@l		175013	38000	022	022	24337	145743	8800	178077	6181	00714			
5	B@n@B@er@B@n@n@M@v@e@l		20524884	41688455	4081	4081	20100000	21000000	1088225	20800000	776740	0000000			
<b>D. KAWASIH PERALATAN</b>															
1	B@n@B@er		7080000	3548000	-	-	1860000	2880000	1100000	2530000	-	2530000	-	2530000	-
2	B@n@B@er		4100000	2080000	-	-	1100000	1678000	67700	1470000	-	1470000	-	1470000	-
3	B@n@B@er		24054388	4704400	300	300	300000	2602000	98000	2400078	7202	2400078	7202	2400078	7202
4	B@n@B@er		7880100	1028000	902	902	1000000	700000	280000	8013000	247000	8013000	247000	8013000	247000
5	C@w@e		1428571	1428571	1428571	1428571	1428571	1428571	1428571	1428571	1428571	1428571	1428571	1428571	1428571
6	P@n@n@Q@u@n		1300000	1300000	1300000	1300000	1300000	1300000	1300000	1300000	1300000	1300000	1300000	1300000	1300000
7	M@v@e@l		8800000	02274008	2730000	2730000	2730000	2730000	2730000	2730000	2730000	2730000	2730000	2730000	2730000
<b>E. Total Elemen Sama Awal</b>															
			1,090,000,000	1,019,000,000	27,276,40	27,276,40	271,300,00	680,800,00	54,000,76	618,800,46	88,000,44	618,800,46	88,000,44	618,800,46	88,000,44
<b>F. Total Elemen Sama Akhir dan Jadian</b>															
			1,090,000,000	1,019,000,000	27,276,40	27,276,40	271,300,00	680,800,00	54,000,76	618,800,46	88,000,44	618,800,46	88,000,44	618,800,46	88,000,44





**DAFTAR HARGA ALAT BERAT BARU 2024**

<b>No.</b>	<b>Jenis Bahan/Material</b>	<b>Satuan</b>	<b>Harga Satuan (Rp)</b>
1.	Agitator Truck, 8 m3	Buah	1,753,134,000
2.	Batching Plant, 60 m3/jam	Buah	3,396,000,000
3.	Bor Listrik (Portable) 300 Watt	Buah	
4.	Compressor 4000-6500 L/M	Buah	
5.	Concrete Pump Trailer, 60 m3/jam	Buah	1,637,361,000
6.	Concrete Vibrator	Buah	
7.	Crane Truck Hydraulic	Buah	1,780,770,000
8.	Dump Truck, 7 ton	Buah	567,138,630
9.	Excavator, 150-135 HP	Buah	2,575,200,000
10.	Excavator Breaker	Buah	2,575,200,000
11.		Buah	
12.	Grouting Pump 0,50-1,5 m3/jam, 25 Bar	Buah	
13.	Diesel Generator, 2 kVA	Buah	
14.	Mesin Jahit Geotekstil	Buah	
15.	Mesin Pembengkok Besi	Buah	
16.	Mesin Pemotong Besi	Buah	
17.	Mesin Stamper	Buah	
18.	Molen, 0.35 m3	Buah	
19.	Pompa Air	Buah	
20.	Pemotong Kain / Geotextile	Buah	240,000
21.	#REF!	Buah	891,450,000
22.	Wheel Loader, 1.0-1.6 m3	Buah	532,659,200

**LAMPIRAN**  
**REKAPITULASIANALISIS HARGA SATUAN PEKERJAAN**  
**( A H S P )**

No. Analisis	Uraian Pekerjaan	Satuan	Harga Satuan (Rp)
<b>A</b>	<b>PREPARATION WORKS</b>		
A.01	Mobilization and Demobilization of Construction Equipment	Ls	1,124,000,000
A.02	Project Facilities (Board of Directors)	Ls	706,158,000
A.03	Pembuatan Direksi Keet (Kantor)	m2	3,330,790
A.04	Pasangan 1 m Bouwplank	m'	63,330
A.05	Stake Out Trase Infrastruktur Baru di Lapangan & Patok Kayu (Kaso 5/7) Pa	m2	20,740
A.06	pasangan 1 m Profil Melintang Galian	m	26,120
A.08	Penyelenggaraan Sistem Manajemen Keselamatan Konstruksi (SMKK)	Ls	1,805,747,000

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : A.01  
 Macam pekerjaan : Mobilization and Demobilization of Construction Equipment  
 Kuantitas pekerjaan : 1 Ls  
 Satuan pengukuran : Ls  
 Harga Satuan : Rp 1,124,000,000

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Mobilisasi</b>					
	<i>Dengan Lowbed Trailer</i>					
1.	Excavator Standar 135-150 HP		unit	12.00	25,000,000	300,000,000
2.	Batching Plant, 60 m <sup>3</sup> /jam		unit	2.00	25,000,000	50,000,000
3.	Wheel Loader		unit	7.00	25,000,000	175,000,000
	<i>Tanpa Lowbed Trailer</i>					
1.	Agitator Truck, 8 m <sup>3</sup>		unit	14.00	1,000,000	14,000,000
2.	Dump Truck, 7 ton		unit	21.00	1,000,000	21,000,000
3.	Crane Truck Hydraulic		unit	2.00	1,000,000	2,000,000
<b>B</b>	<b>Demobilisasi</b>					
	<i>Dengan Lowbed Trailer</i>					
1.	Excavator Standar 135-150 HP		unit	12.00	25,000,000	300,000,000
2.	Batching Plant, 60 m <sup>3</sup> /jam		unit	2.00	25,000,000	50,000,000
3.	Wheel Loader		unit	7.00	25,000,000	175,000,000
	<i>Tanpa Lowbed Trailer</i>					
1.	Agitator Truck, 8 m <sup>3</sup>		unit	14.00	1,000,000	14,000,000
2.	Dump Truck, 7 ton		unit	21.00	1,000,000	21,000,000
3.	Crane Truck Hydraulic		unit	2.00	1,000,000	2,000,000
<b>B</b>	<b>Jumlah</b>					<b>1,124,000,000</b>
<b>C</b>	<b>Harga Satuan Pekerjaan</b>					<b>1,124,000,000</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : A.02  
 Macam pekerjaan : Project Facilities (Board of Directors)  
 Kuantitas pekerjaan : 1 Ls  
 Satuan pengukuran : Ls  
 Harga Satuan : Rp 706,158,000

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah Harga (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
<b>Jumlah Harga Tenaga Kerja</b>						-
<b>B</b>	<b>Bahan Pakai habis</b>					
	1. Pembuatan Direksi Keet (Kantor)	A.03	m2	200.00	3,330,790	666,158,000
	2. Sewa Lahan		m2	30.00	1,333,333	40,000,000
<b>Jumlah Harga Bahan Pakai habis</b>						<b>706,158,000</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						-
<b>D</b>	<b>Jumlah (A + B + C)</b>					706,158,000
<b>F</b>	<b>Harga Satuan Pekerjaan per - Ls (D)</b>					<b>706,158,000</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : A.03  
 Macam pekerjaan : Pembuatan Direksi Keet (Kantor)  
 Kuantitas pekerjaan : 1 m2  
 Satuan pengukuran : m2  
 Harga Satuan : Rp 3,330,790

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah Harga (Rp)
<b>A Tenaga Kerja</b>						
1.	Pekerja	L. 01	orang/hari	1.20	91,259	109,511
2.	Tukang Batu	L. 03	orang/hari	0.40	91,259	36,504
3.	Kepala Tukang Batu	L. 9	orang/hari	0.04	95,000	3,800
4.	Mandor	L. 13	orang/hari	0.12	100,000	12,000
<b>Jumlah Harga Tenaga Kerja</b>						<b>161,814</b>
<b>B Bahan</b>						
1.	Kaso 5/7 cm	M. 32	m3	0.35	2,811,900	984,165
2.	Triplek, tebal 4 mm	M. 86	lembar	1.00	76,100	76,100
3.	Pasangan batu kosong (Aanstamping)	G.02	m3	0.17	515,790	87,684
4.	GRC 6 mm	M. 23	lembar	1.24	154,500	191,580
5.	Paku biasa	M. 42	kg	0.75	28,000	21,000
6.	Asbes gelombang	M. 4	lembar	0.30	101,000	30,300
7.	Paku asbes	M. 41	kg	0.10	38,000	3,800
8.	Floor lantai (beton lantai kerja)	F.06	m3	0.15	959,310	143,897
9.	Pintu double teakwood rangka kayu	M. 57	m2	0.10	670,000	67,000
10.	Frame besi kaca nako	M. 20	daun	1.00	550,000	550,000
11.	Cat dinding/plafon	G.04	m2	16.50	43,070	710,655
<b>Jumlah Harga Bahan</b>						<b>2,866,181</b>
<b>C Peralatan</b>						
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D Jumlah (A + B + C)</b>						<b>3,027,995</b>
<b>E Overhead &amp; Profit (10% x D)</b>						<b>302,799</b>
<b>F Harga Satuan Pekerjaan per - m2 (D + E)</b>						<b>3,330,790</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : A.04  
 Macam pekerjaan : Pasangan 1 m Bouwplank  
 Kuantitas pekerjaan : 1 m'  
 Satuan pengukuran : m'  
 Harga Satuan : Rp 63,330

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.012	91,259	1,095
2.	Tukang kayu	L. 07	orang/hari	0.006	91,259	548
3.	Kepala tukang	L. 8	orang/hari	0.001	95,000	57
4.	Mandor	L. 13	orang/hari	0.001	100,000	120
<b>Jumlah Harga Tenaga Kerja</b>						<b>1,820</b>
<b>B</b>	<b>Bahan</b>					
1.	Kaso 5/7 cm	M. 32	m3	0.013	2,811,900	36,555
2.	Paku 1 cm - 2,5 cm	M. 39	kg	0.020	20,000	400
3.	Papan kayu bekisting	M. 45	m3	0.007	2,686,000	18,802
<b>Jumlah Harga Bahan</b>						<b>55,757</b>
<b>C</b>	<b>Peralatan</b>					
1.	Waterpass Digital	E. 22	hari	0.006	200,000	1,200
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>57,576</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>5,758</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m' (D + E)</b>					<b>63,330</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : A.05  
 Macam pekerjaan : Stake Out Trase Infrastruktur Baru di Lapangan & Patok Kayu (Kaso  
 : 5/7) Panjang 1 m  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 20,740

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.010	91,259	876
2.	Tukang kayu	L. 07	orang/hari	0.005	91,259	438
3.	Kepala tukang	L. 8	orang/hari	0.005	95,000	456
4.	Mandor	L. 13	orang/hari	0.001	100,000	96
<b>Jumlah Harga Tenaga Kerja</b>						<b>1,866</b>
<b>B</b>	<b>Bahan</b>					
1.	Kaso 5/7 cm	M. 32	m3	0.004	2,811,900	9,842
2.	Paku Payung	M. 43	Buah	1.100	6,500	7,150
<b>Jumlah Harga Bahan</b>						<b>16,992</b>
<b>C</b>	<b>Peralatan</b>					
1.	Waterpass Digital	E. 22	hari	0.005	200,000	960
2.	Theodolite Digital	E. 21	hari	0.005	350,000	1,680
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>18,858</b>
<b>E</b>	<b>Overhead &amp; Profit (10%x D)</b>					<b>1,886</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m2 (D + E)</b>					<b>20,740</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : A.06  
 Macam pekerjaan : pemasangan 1 m Profil Melintang Galian  
 Kuantitas pekerjaan : 1 m  
 Satuan pengukuran : m  
 Harga Satuan : Rp 26,120

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.007	91,259	657
2.	Tukang kayu	L. 07	orang/hari	0.004	91,259	329
3.	Kepala tukang	L. 8	orang/hari	0.0004	95,000	34
4.	Mandor	L. 13	orang/hari	0.001	100,000	72
<b>Jumlah Harga Tenaga Kerja</b>						<b>1,092</b>
<b>B</b>	<b>Bahan</b>					
1.	Kaso 4/6 cm	M. 31	m3	0.003	2,811,900	7,030
2.	Papan Kayu Kelas III	M. 46	m3	0.004	2,595,600	10,902
3.	Paku 5 cm dan 7 cm	M. 40	kg	0.200	20,000	4,000
<b>Jumlah Harga Bahan</b>						<b>21,931</b>
<b>C</b>	<b>Peralatan</b>					
1.	Waterpass Digital	E. 22	hari	0.0036	200,000	720
<b>Jumlah Harga Peralatan</b>						<b>720</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>23,743</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>2,374</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m (D + E)</b>					<b>26,120</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : A.07  
 Macam pekerjaan : Patok Kayu (Kaso 5/7) Panjang 1 m  
 Kuantitas pekerjaan : 1 Buah  
 Satuan pengukuran : Buah  
 Harga Satuan : Rp 22,010

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.012	91,259	1,095
2.	Tukang kayu	L. 07	orang/hari	0.006	91,259	548
3.	Kepala tukang	L. 8	orang/hari	0.001	95,000	57
4.	Mandor	L. 13	orang/hari	0.001	100,000	120
<b>Jumlah Harga Tenaga Kerja</b>						<b>1,820</b>
<b>B</b>	<b>Bahan</b>					
1.	Kaso 5/7 cm	M. 32	m3	0.004	2,811,900	9,842
2.	Paku Payung	M. 43	Buah	1.100	6,500	7,150
<b>Jumlah Harga Bahan</b>						<b>16,992</b>
<b>C</b>	<b>Peralatan</b>					
1.	Waterpass Digital	E. 22	hari	0.006	200,000	1,200
<b>Jumlah Harga Peralatan</b>						<b>1,200</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>20,011</b>
<b>E</b>	<b>Overhead &amp; Profit (10%x D)</b>					<b>2,001</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - Buah (D + E)</b>					<b>22,010</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : A.08  
 Macam pekerjaan : Penyelenggaraan Sistem Manajemen Keselamatan Konstruksi (SMKK)  
 Kuantitas pekerjaan : 1 Ls  
 Satuan pengukuran : Ls  
 Harga Satuan : Rp 1,805,747,000

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah Harga (Rp)
<b>A Penyiapan Dokumen Penerapan SMKK</b>						
1.	Pembuatan Dokumen SMKK (RKK, RMPK,		Set	20.00	150,000	3,000,000
2.	Pembuatan Prosedur dan Instruksi Kerja		Set	4.00	150,000	600,000
3.	Penyusunan Laporan Penerapan SMKK		Set	4.00	150,000	600,000
<b>B Sosialisasi, Promosi dan Pelatihan</b>						
1.	Induksi Keselamatan Konstruksi (Safety Induction);		Org	110.00	50,000	5,500,000
2.	Pengarahan Keselamatan Konstruksi (Safety Briefing);		Org	110.00	15,000	1,650,000
3.	Pertemuan mengenai keselamatan (Safety		Org	100.00	10,000	1,000,000
4.	Patroli keselamatan;		Durasi	288.00	200,000	57,600,000
5.	Pelatihan Keselamatan Konstruksi;					
	- P3K		Org	100.00	65,000	6,500,000
	- Bekerja di ketinggian		Org	100.00	65,000	6,500,000
	- Analisis keselamatan pekerjaan		Org	100.00	65,000	6,500,000
	- Perilaku berbasis keselamatan (Budaya K3)		Org	100.00	65,000	6,500,000
6.	Simulasi Keselamatan Konstruksi;		Org	100.00	65,000	6,500,000
7.	Spanduk / Banner Proyek		Lembar	20.00	121,000	2,420,000
8.	Poster Proyek		Lb	20.00	50,000	1,000,000
9.	Papan Informasi K3		Buah	15.00	1,988,600	29,829,000
<b>C Alat Pelindung Kerja (APK) dan Alat Pelindung Diri (APD)</b>						
1.	Alat Pelindung Kerja (APK)					
	Jaring Pengaman (Safety Net)		m	300.00	6,130	1,839,000
	Tali Keselamatan (Life Line)		m	300.00	31,056	9,316,650
	Pembatas Area (Restricted Area)		Ls	1.00	1,500,000	1,500,000
	Pelindung Jatuh (Fall Arrester)		Set	30.00	616,000	18,480,000
2.	Alat Pelindung Diri (APD)					
	Helm Pelindung (Safety Helmet)		Buah	130.00	51,500	6,695,000
	Pelindung Mata (Goggles, Spectacles)		Set	20.00	206,000	4,120,000
	Pelindung Telinga (Ear Plus, Ear Nuff)		Set	60.00	51,500	3,090,000
	Pelindung Pernapasan dan Mulut (Masker)		Buah	1,440.00	51,500	74,160,000
	Sarung Tangan (Safety Gloves)		Set	400.00	5,150	2,060,000
	Sepatu Keselamatan (Safety Shoes)		set	260.00	257,500	66,950,000
	Penunjang Seluruh Tubuh (Full Body Harness)		Buah	20.00	103,000	2,060,000
	Rompi Keselamatan (Safety Vest)		Buah	130.00	154,500	20,085,000
	Jas Hujan (Raincoat)		Set	100.00	242,000	24,200,000
<b>D Asuransi dan Perizinan</b>						
1.	BPJS Ketenagakerjaan dan Kesehatan Kerja		Ls	1.00	206,000,000	206,000,000
<b>E Personel K3 Konstruksi</b>						
1.	Ahli K3 Konstruksi (S1, AHLI MADYA, 3 TAHUN)		OB	24.00	23,844,500	572,268,000
2.	Petugas K3 Konstruksi		OB	72.00	2,281,469	164,265,768
3.	Petugas Pengatur Lalu Lintas (Flagman)		OB	144.00	2,281,469	328,531,536
4.	Tenaga Medis (Dokter)		OK	8.00	1,600,000	12,800,000
5.	Petugas Paramedis		OK	8.00	750,000	6,000,000
<b>F Fasilitas, Sarana, Prasarana dan Alat Kesehatan</b>						

1.	Peralatan P3K (Kotak P3K, Tandu, Obat Luka,	set	3.00	4,000,000	12,000,000
<b>G Rambu-Rambu yang Diperlukan</b>					
1.	Rambu Petunjuk	Buah	10.00	128,750	1,287,500
2.	Rambu Larangan	Buah	10.00	128,750	1,287,500
3.	Rambu Peringatan	Buah	10.00	128,750	1,287,500
4.	Rambu Kewajiban	Buah	10.00	128,750	1,287,500
5.	Rambu Informasi	Buah	10.00	128,750	1,287,500
6.	Rambu Pekerjaan Sementara	Buah	10.00	128,750	1,287,500
7.	Rambu Jalur Evakuasi	Buah	10.00	128,750	1,287,500
8.	Tongkat Pengatur Lalu Lintas (Warning Lights Stick)	Buah	10.00	57,000	570,000
9.	Kerucut Lalu Lintas (Rubber Cone)	Buah	20.00	36,050	721,000
<b>H Konsultasi dengan Ahli Terkait Keselamatan Konstruksi</b>					
1.	Ahli Struktur	Kegiatan	2.00	17,760,000	35,520,000
2.	Ahli Bendungan	Kegiatan	2.00	17,760,000	35,520,000
3.	Ahli Lingkungan	Kegiatan	2.00	17,760,000	35,520,000
<b>I Kegiatan dan peralatan terkait dengan pengendalian risiko Keselamatan Konstruksi</b>					
1.	APAR (Alat Pemadam Api Ringan)	Buah	10.00	537,500	5,375,000
2.	Sirine	Set	5.00	361,000	1,805,000
3.	Bendera K3 (Safety Flag)	Buah	10.00	58,900	589,000
4.	Lampu darurat (emergency lamp)	Bh	10.00	200,000	2,000,000
5.	CCTV Outdoor	Unit	5.00	1,399,000	6,995,000
<b>J</b>	<b>Harga Satuan Pekerjaan</b>				<b>1,805,747,000</b>

**LAMPIRAN**  
**ANALISA HARGA SATUAN PEKERJAAN**  
**(AHSPK)**

No. : A.01 (2)  
 Jenis Pekerjaan : Mobilisasi dan Demobilisasi Peralatan Konstruksi  
 Harga Satuan : Rp 1,197,611,100  
 Satuan : LS

A. Mob - Demob : Surabaya - Lumajang 180 km  
 Harga Mob-Demob 25,000,000  
 Dimensi Trailer 29 m<sup>2</sup> Harga Vendor

No.	Alat	Satuan	Volume	Keterangan dimensi Alat (m <sup>2</sup> /unit)	Jumlah Trailer	Rute	Biaya Mob-demob (Rp)	Jumlah (Rp)
<b>I</b>	<b>PERALATAN</b>							
	Menggunakan Trailer							
1.	Excavator Standar 135-150 HP	unit	12	26.60	12	2	25,000,000	600,000,000
2.	Batching Plant, 60 m <sup>3</sup> /jam	unit	2	100.00	3	2	25,000,000	173,611,111
3.	Wheel Loader	unit	7	26.60	7	2	25,000,000	350,000,000
	Total				22			
No.	Alat	Satuan	Volume	Keterangan dimensi Alat (m <sup>2</sup> /unit)	Jumlah Trailer	Rute	Biaya Mob-demob (Rp)	Jumlah (Rp)
	Tanpa Menggunakan Trailer							
1.	Agitator Truck, 8 m <sup>3</sup>	unit	14	-	-	2	1,000,000	28,000,000
2.	Dump Truck, 7 ton	unit	21	-	-	2	1,000,000	42,000,000
3.	Crane Truck Hydraulic	unit	2	-	-	2	1,000,000	4,000,000
4.	Concrete Pump	unit	8			2		-
5.	Concrete Vibrator	unit	36			2		-
6.	Mesin Stamper	unit	16			2		-
7.	Pompa Air	unit	2			2		-
8.	Pemotong Besi	unit	1			2		-
9.	Pembengkok Besi	unit	1			2		-
10.	Drilling Machine	unit	1			2		-
	<b>Biaya langsung (Sub Total I)</b>							1,197,611,111
<b>V</b>	<b>HARGA SATUAN PEKERJAAN PEMBULATAN (Rp. / LS)</b>							<b>1,197,611,100</b>

**LAMPIRAN**  
**REKAPITULASIANALISIS HARGA SATUAN PEKERJAAN**  
**( A H S P )**

<b>No. Analisis</b>	<b>Uraian Pekerjaan</b>	<b>Satuan</b>	<b>Harga Satuan (Rp)</b>
<b>B</b>	<b>IMPLEMENTATIDN OF CONSTRUCTIDN SAFETY MANAGEMENT SYSTEM (SMKK)</b>		
B.01	Implementation of Construction Safety Management System (SMKK)	Ls	1,874,927,000

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : B.01  
 Macam pekerjaan : Implementation of Construction Safety Management System (SMKK)  
 Kuantitas pekerjaan : 1 Ls  
 Satuan pengukuran : Ls  
 Harga Satuan : Rp 1,874,927,000

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah Harga (Rp)
<b>A Penyiapan Dokumen Penerapan SMKK</b>						
1.	Pembuatan Dokumen SMKK (RKK, RMPK,		Set	20.00	150,000	3,000,000
2.	Pembuatan Prosedur dan Instruksi Kerja		Set	4.00	150,000	600,000
3.	Penyusunan Laporan Penerapan SMKK		Set	4.00	150,000	600,000
<b>B Sosialisasi, Promosi dan Pelatihan</b>						
1.	Induksi Keselamatan Konstruksi (Safety Induction);		Org	160.00	50,000	8,000,000
2.	Pengarahan Keselamatan Konstruksi (Safety Briefing);		Org	160.00	15,000	2,400,000
3.	Pertemuan mengenai keselamatan (Safety		Org	150.00	10,000	1,500,000
4.	Patroli keselamatan;		Durasi	288.00	200,000	57,600,000
5.	Pelatihan Keselamatan Konstruksi;					
	- P3K		Org	150.00	65,000	9,750,000
	- Bekerja di ketinggian		Org	150.00	65,000	9,750,000
	- Analisis keselamatan pekerjaan		Org	150.00	65,000	9,750,000
	- Perilaku berbasis keselamatan (Budaya K3)		Org	150.00	65,000	9,750,000
6.	Simulasi Keselamatan Konstruksi;		Org	150.00	65,000	9,750,000
7.	Spanduk / Banner Proyek		Lembar	20.00	121,000	2,420,000
8.	Poster Proyek		Lb	20.00	50,000	1,000,000
9.	Papan Informasi K3		Buah	15.00	1,988,600	29,829,000
<b>C Alat Pelindung Kerja (APK) dan Alat Pelindung Diri (APD)</b>						
1.	Alat Pelindung Kerja (APK)					
	Jaring Pengaman (Safety Net)		m	300.00	6,130	1,839,000
	Tali Keselamatan (Life Line)		m	300.00	31,056	9,316,650
	Pembatas Area (Restricted Area)		Ls	1.00	1,500,000	1,500,000
	Pelindung Jatuh (Fall Arrester)		Set	30.00	616,000	18,480,000
2.	Alat Pelindung Diri (APD)					
	Helm Pelindung (Safety Helmet)		Buah	180.00	51,500	9,270,000
	Pelindung Mata (Goggles, Spectacles)		Set	20.00	206,000	4,120,000
	Pelindung Telinga (Ear Plus, Ear Nuff)		Set	60.00	51,500	3,090,000
	Pelindung Pernapasan dan Mulut (Masker)		Buah	1,440.00	51,500	74,160,000
	Sarung Tangan (Safety Gloves)		Set	600.00	5,150	3,090,000
	Sepatu Keselamatan (Safety Shoes)		set	360.00	257,500	92,700,000
	Penunjang Seluruh Tubuh (Full Body Harness)		Buah	20.00	103,000	2,060,000
	Rompi Keselamatan (Safety Vest)		Buah	180.00	154,500	27,810,000
	Jas Hujan (Raincoat)		Set	150.00	242,000	36,300,000
<b>D Asuransi dan Perizinan</b>						
1.	BPJS Ketenagakerjaan dan Kesehatan Kerja		Ls	1.00	206,000,000	206,000,000
<b>E Personel K3 Konstruksi</b>						
1.	Ahli K3 Konstruksi (S1, AHLI MADYA, 3 TAHUN)		OB	24.00	23,844,500	572,268,000
2.	Petugas K3 Konstruksi		OB	72.00	2,281,469	164,265,768
3.	Petugas Pengatur Lalu Lintas (Flagman)		OB	144.00	2,281,469	328,531,536
4.	Tenaga Medis (Dokter)		OK	8.00	1,600,000	12,800,000
5.	Petugas Paramedis		OK	8.00	750,000	6,000,000
<b>F Fasilitas, Sarana, Prasarana dan Alat Kesehatan</b>						
1.	Peralatan P3K (Kotak P3K, Tandu, Obat Luka,		set	3.00	4,000,000	12,000,000

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah Harga (Rp)
<b>G</b>	<b>Rambu-Rambu yang Diperlukan</b>					
1.	Rambu Petunjuk		Buah	10.00	128,750	1,287,500
2.	Rambu Larangan		Buah	10.00	128,750	1,287,500
3.	Rambu Peringatan		Buah	10.00	128,750	1,287,500
4.	Rambu Kewajiban		Buah	10.00	128,750	1,287,500
5.	Rambu Informasi		Buah	10.00	128,750	1,287,500
6.	Rambu Pekerjaan Sementara		Buah	10.00	128,750	1,287,500
7.	Rambu Jalur Evakuasi		Buah	10.00	128,750	1,287,500
8.	Tongkat Pengatur Lalu Lintas (Warning Lights Stick)		Buah	10.00	57,000	570,000
9.	Kerucut Lalu Lintas (Rubber Cone)		Buah	20.00	36,050	721,000
<b>H</b>	<b>Konsultasi dengan Ahli Terkait Keselamatan Konstruksi</b>					
1.	Ahli Struktur		Kegiatan	2.00	17,760,000	35,520,000
2.	Ahli SDA		Kegiatan	2.00	17,760,000	35,520,000
3.	Ahli Lingkungan		Kegiatan	2.00	17,760,000	35,520,000
<b>I</b>	<b>Kegiatan dan peralatan terkait dengan pengendalian risiko Keselamatan Konstruksi</b>					
1.	APAR (Alat Pemadam Api Ringan)		Buah	10.00	537,500	5,375,000
2.	Sirine		Set	5.00	361,000	1,805,000
3.	Bendera K3 (Safety Flag)		Buah	10.00	58,900	589,000
4.	Lampu darurat (emergency lamp)		Bh	10.00	200,000	2,000,000
5.	CCTV Outdoor		Unit	5.00	1,399,000	6,995,000
<b>J</b>	<b>Harga Satuan Pekerjaan</b>					<b>1,874,927,000</b>

**LAMPIRAN**  
**REKAPITULASIANALISIS HARGA SATUAN PEKERJAAN**  
**( A H S P )**

No. Analisis	Uraian Pekerjaan	Satuan	Harga Satuan (Rp)	Referensi
<b>C</b>	<b>RIVER WATERING &amp; DEWATERING WORK</b>			
C.01	1 Piece of Sand Geobag Size 145 x 240 cm	Buah	468,500	
C.02	Hourly operation of a 5 KW diesel water pump with a maximum suction head	Jam	61,760	

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : C.01  
 Macam pekerjaan : 1 Piece of Sand Geobag Size 145 x 240 cm  
 Kuantitas pekerjaan : 1 Buah  
 Satuan pengukuran : Buah  
 Harga Satuan : Rp 468,500

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.1800	91,259	16,427
2.	Tukang	L. 02	orang/hari	0.0600	91,259	5,476
3.	Mandor	L. 13	orang/hari	0.0180	100,000	1,800
<b>Jumlah Harga Tenaga Kerja</b>						<b>23,702</b>
<b>B</b>	<b>Bahan</b>					
1.	Geotextile Non Woven 500gr	M. 22	m2	7.5000	29,100	218,250
2.	Tali rafia/plastik	M. 83	m	3.2000	60	192
3.	Pasir Urug	M. 49	m3	0.4200	-	-
<b>Jumlah Harga Bahan</b>						<b>218,442</b>
<b>C</b>	<b>Peralatan</b>					
1.	Pemotong Kain / Geotekstil	E. 18	Hari	0.9420	191,100	180,016
2.	Mesin Jahit Geotekstil	E. 13	Hari	0.0190	197,400	3,751
<b>Jumlah Harga Peralatan</b>						<b>183,767</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>425,911</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>42,591</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - Buah (D + E)</b>					<b>468,500</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : C.02  
 Macam pekerjaan : Hourly operation of a 5 KW diesel water pump with a maximum suction head of 3 m and a maximum discharge head of 10 m (capacity 10 L/s at a suction head of 1 m and a discharge head of 10 m)  
 Kuantitas pekerjaan : 1 Jam  
 Satuan pengukuran : Jam  
 Harga Satuan : Rp 61,760

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
<b>Jumlah Harga Tenaga Kerja</b>						-
<b>B</b>	<b>Bahan</b>					
<b>Jumlah Harga Bahan</b>						-
<b>C</b>	<b>Peralatan</b>					
1.	Pompa Air	E. 19	jam	0,62	91,000	56,147
<b>Jumlah Harga Peralatan</b>						<b>56,147</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					56,147
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					5,615
<b>F</b>	<b>Harga Satuan Pekerjaan per - Jam (D + E)</b>					<b>61,760</b>

**LAMPIRAN**  
**REKAPITULASI ANALISIS HARGA SATUAN PEKERJAAN**  
**(A HSP)**

No. Analisis	Uraian Pekerjaan	Satuan	Harga Satuan (Rp)
<b>D</b>	<b>PEKERJAAN PEMBONGKARAN</b>		
D.01	Demolition with RDB, Loading of Demolition Materials (Rock f >25 cm) and Trans	m3	53,760

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : D.01  
 Macam pekerjaan : Demolition with RDB, Loading of Demolition Materials (Rock  $\phi$  >25 cm) and Transport, (mechanically, transported to the disposal area with a distance of up to 500 m)  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 53,760.00

No.	Uraian	Kode	Satuan	Volume	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0.027	13,037	348
2.	Mandor	L. 13	orang/jam	0.0027	14,286	38
<b>Jumlah Harga Tenaga Kerja</b>						<b>386</b>
<b>B</b>	<b>Bahan</b>					
<b>Jumlah Harga Bahan</b>						<b>-</b>
<b>C</b>	<b>Peralatan</b>					
1.	Excavator Breaker	E. 010	jam	0.0267	743,200	19,818
2.	Excavator, 150-135 HP	E. 09	jam	0.0112	897,200	10,033
3.	Dump Truck, 7 ton	E. 08	jam	0.0468	398,300	18,636
<b>Jumlah Harga Peralatan</b>						<b>48,487</b>
<b>D</b>	<b>Jumlah (A +B +C)</b>					<b>48,873</b>
<b>E</b>	<b>Overhead &amp; Profit (10%ox D)</b>					<b>4,887</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>3</sup> (D +E)</b>					<b>53,760</b>

**ANALISA PRODUKSIALAT**

Jenis Pekerjaan

: Membongkar dengan RDB, Muat Hasil Bongkar (Batu  $\phi > 25$  cm) dan Angkut (secara mekanis, diangkut ke disposal area dengan jarak sampai 500 m)

No.	Uraian	Kode	Koefisien	Satuan	Keterangan
<b>I</b>	<b>ASUMSI</b>				
1.	Jam Kerja efektif per hari	Tk	7.00	jam	
2.	Faktor konversi material batu asli (masif) ke lepas	Fk	1.65		Tabel A.1
3.	Ukuran maksimum batu 100 cm				
4.	Pelaksanaan Pembongkaran dan Pemuatan Batu Keras $\phi > 25$ cm dengan RDB + Excavator		9.22	m <sup>3</sup> /jam	
<b>II</b>	<b>PERHITUNGAN</b>				
<b>1.</b>	<b>BAHAN :</b>				
	Tidak ada bahan yang diperlukan				
<b>2.</b>	<b>ALAT :</b>				
a	<b>Excavator Breaker</b>				
	Kapasitas Produksi Membongkar (Memecah Pasangan Batu)	Q1	74.55	m <sup>3</sup> /jam	Batu Lunak
	Faktor Efisiensi Alat	Fa	0.83		Kondisi Baik
	Kapasitas Produksi / jam : $V \times Fa / Fk$	Q1'	37.50	m <sup>3</sup> /jam	
	Koefisien Alat / m3 : $1 / Q1'$		0.03	jam	
b	<b>Pemuatan Material ke DT</b>				
	<b>Excavator, 150-135 HP</b>				
	Kapasitas Bucket	V	0.80	m3	
	Faktor Bucket	Fb	1.00		Tabel a.10
	Faktor Efisiensi Alat	Fa	0.83	-	Kondisi Baik
	Waktu Siklus	Ts1		menit	
	Mengeruk material dari Stoc Swing + Muat ke DT	T.1	0.30	menit	Tabel 10
		Ts.1'	0.30	menit	
	Kapasitas Produksi / jam = $(V \times Fb \times Fa \times 60) / (Ts.1 \times Fv \times Fk)$	Q2	89.43	m <sup>3</sup> /jam	Fv = Faktor Konvers
	Koefisien Alat / m3 = $1 / Q2$		0.011	jam	
c	<b>Pengangkutan Material ke Disposal Area</b>				
	<b>Dump Truck, 7 ton</b>				
	Jarak dari lokasi penggalian ke tempat lainnya	L	0.50	km	jarak rencana posisi
	Kapasitas Bak	V	6.07	m3	1.35 - 1.65
	Faktor efisiensi alat	Fa	0.83		Kondisi Baik
	Kecepatan rata-rata bermuatan	V1	20.00	km/jam	Menanjak & Menurun
	Kecepatan rata-rata kosong	V2	30.00	km/jam	Menanjak & Menurun
	Faktor konversi bahan	Fk	1.65		Tabel A.1
	<b>Pengangkutan ke disposal area</b>				
	Waktu siklus	Ts.2			
	- Waktu memuat = $(V / Q2) \times 60$	T1	4.07	menit	
	- Waktu tempuh isi = $(L / V1) \times 60$	T2	1.50	menit	
	- Waktu tempuh kosong = $(L / V2) \times 60$	T3	1.00	menit	
	- Waktu lain-lain	T4	2.00	menit	
		Ts.2'	8.57	menit	
	Kapasitas Produksi / jam = $(V \times Fa \times 60) / (Ts.2' \times Fk)$	Q3	21.37	m <sup>3</sup> /jam	
	Koefisien alat / m3 = $(1 : Q3)$		0.0468	jam	
<b>3.</b>	<b>TENAGA :</b>				
a	<b>Produksi : Excavator Breaker</b>				
	Produksi / hari = $Tk \times Q1'$	Q1'	37.50	m3/jam	
		Qt	262.51	m3	
	Kebutuhan Tenaga Kerja				
	Pekerja	P	1.00		
	Mandor	M	0.10		
	Koefisien Tenaga Kerja / m3				
	Pekerja $(Tk \times P) / Qt$		0.0267		
	Mandor $(Tk \times M) / Qt$		0.0027		

**LAMPIRAN**  
**REKAPITULASIANALISIS HARGA SATUAN PEKERJAAN**  
**( A H S P )**

No. Analisis	Uraian Pekerjaan	Satuan	Harga Satuan (Rp)
<b>E</b>	<b>EARTHWORKS</b>		
E.01	Bowplank Installation	m'	63,330
E.02	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	20,740
E.03	Excavation Cross Profile	m	26,120
E.04	Mechanical Sand Excavation (transported to disposal area, distance 0 m to 500 m)	m3	19,520
E.05	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	8,440
E.06	Backfill Sand (Material from Excavation, Mechanically)	m3	16,360

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : E.01  
 Macam pekerjaan : Bowplank Installation  
 Kuantitas pekerjaan : 1 m'  
 Satuan pengukuran : m'  
 Harga Satuan : Rp 63,330

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.012	91,259	1,095
2.	Tukang kayu	L. 07	orang/hari	0.006	91,259	548
3.	Kepala tukang	L. 8	orang/hari	0.001	95,000	57
4.	Mandor	L. 13	orang/hari	0.001	100,000	120
<b>Jumlah Harga Tenaga Kerja</b>						<b>1,820</b>
<b>B</b>	<b>Bahan</b>					
1.	Kaso 5/7 cm	M. 32	m3	0.013	2,811,900	36,555
2.	Paku 1 cm - 2,5 cm	M. 39	kg	0.020	20,000	400
3.	Papan kayu bekisting	M. 45	m3	0.007	2,686,000	18,802
<b>Jumlah Harga Bahan</b>						<b>55,757</b>
<b>C</b>	<b>Peralatan</b>					
1.	Waterpass Digital	E. 22	hari	0.006	200,000	1,200
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>57,576</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>5,758</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m' (D + E)</b>					<b>63,330</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : E.02  
 Macam pekerjaan : Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7)  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 20,740

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.010	91,259	876
2.	Tukang kayu	L. 07	orang/hari	0.005	91,259	438
3.	Kepala tukang	L. 8	orang/hari	0.005	95,000	456
4.	Mandor	L. 13	orang/hari	0.001	100,000	96
<b>Jumlah Harga Tenaga Kerja</b>						<b>1,866</b>
<b>B</b>	<b>Bahan</b>					
1.	Kaso 5/7 cm	M. 32	m3	0.004	2,811,900	9,842
2.	Paku Payung	M. 43	Buah	1.100	6,500	7,150
<b>Jumlah Harga Bahan</b>						<b>16,992</b>
<b>C</b>	<b>Peralatan</b>					
1.	Waterpass Digital	E. 22	hari	0.005	200,000	960
2.	Theodolite Digital	E. 21	hari	0.005	350,000	1,680
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>18,858</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>1,886</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>2</sup> (D + E)</b>					<b>20,740</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : E.03  
 Macam pekerjaan : Excavation Cross Profile  
 Kuantitas pekerjaan : 1 m  
 Satuan pengukuran : m  
 Harga Satuan : Rp 26,120

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.007	91,259	657
2.	Tukang kayu	L. 07	orang/hari	0.004	91,259	329
3.	Kepala tukang	L. 8	orang/hari	0.000	95,000	34
4.	Mandor	L. 13	orang/hari	0.0007	100,000	72
<b>Jumlah Harga Tenaga Kerja</b>						<b>1,092</b>
<b>B</b>	<b>Bahan</b>					
1.	Kaso 4/6 cm	M. 31	m3	0.003	2,811,900	7,030
2.	Papan Kayu Kelas III	M. 46	m3	0.004	2,595,600	10,902
3.	Paku 5 cm dan 7 cm	M. 40	kg	0.200	20,000	4,000
<b>Jumlah Harga Bahan</b>						<b>21,931</b>
<b>C</b>	<b>Peralatan</b>					
1.	Waterpass Digital	E. 22	hari	0.004	200,000	720
<b>Jumlah Harga Peralatan</b>						<b>720</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>23,743</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>2,374</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m (D + E)</b>					<b>26,120</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : E.04  
 Macam pekerjaan : Mechanical Sand Excavation (transported to disposal area, distance 0 m to 500 m)  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 19,520

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0.0166	13,037	216
2.	Mandor	L. 13	orang/jam	0.0017	14,286	24
<b>Jumlah Harga Tenaga Kerja</b>						<b>240</b>
<b>B</b>	<b>Bahan</b>					
<b>Jumlah Harga Bahan</b>						<b>-</b>
<b>C</b>	<b>Peralatan</b>					
1.	Excavator, 150-135 HP	E. 09	jam	0.0083	897,200	7,432
2.	Dump Truck, 7 ton	E. 08	jam	0.0253	398,300	10,079
<b>Jumlah Harga Peralatan</b>						<b>17,510</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>17,750</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>1,775</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>3</sup> (D + E)</b>					<b>19,520</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : E.05  
 Macam pekerjaan : Mechanical Sand Excavation (excavated material is dumped nearby)  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 8,440

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0.0166	13,037	216
2.	Mandor	L. 13	orang/jam	0.0017	14,286	24
<b>Jumlah Harga Tenaga Kerja</b>						<b>240</b>
<b>B</b>	<b>Bahan</b>					
<b>Jumlah Harga Bahan</b>						<b>-</b>
<b>C</b>	<b>Peralatan</b>					
1.	Excavator, 150-135 HP	E. 09	jam	0.0083	897,200	7,432
<b>Jumlah Harga Peralatan</b>						<b>7,432</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>7,671</b>
<b>E</b>	<b>Overhead &amp; Profit (10%<math>\times</math> D)</b>					<b>767</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>3</sup> (D + E)</b>					<b>8,440</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : E.06  
 Macam pekerjaan : Backfill Sand (Material from Excavation, Mechanically)  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 16,360

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0.0166	13,037	216
2.	Mandor	L. 13	orang/jam	0.0017	14,286	24
<b>Jumlah Harga Tenaga Kerja</b>						<b>240</b>
<b>B</b>	<b>Bahan</b>					
<b>Jumlah Harga Bahan</b>						<b>-</b>
<b>C</b>	<b>Peralatan</b>					
	a. Hasil Galian					
1.	Excavator, 150-135 HP	E. 09	jam	0.0083	897,200	7,432
2.	Dump Truck, 7 ton	E. 08	jam	0.0181	398,300	7,199
<b>Jumlah Harga Peralatan</b>						<b>14,631</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>14,870</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>1,487</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>3</sup> (D + E)</b>					<b>16,360</b>

**ANALISA PRODUKSIALAT**

Jenis Pekerjaan

: Galian Pasir

(secara mekanis, diangkut ke disposal area dengan jarak sampai 500 m)

No.	Uraian	Kode	Koefisien	Satuan	Keterangan
<b>I</b>	<b>ASUMSI</b>				
1.	Menggunakan alat berat (cara mekanis)				
2.	Pekerjaan meliputi penggalian dan pengangkutan ke disposal area				
3.	Perataan di lokasi disposal				
4.	Waktu jam kerja efektif	Tk	7.00	jam	
<b>II</b>	<b>URUTAN KERJA</b>				
1.	Menentukan batas-batas galian				
2.	Penggalian dilakukan dengan menggunakan Excavator sekaligus memuat material hasil galian ke dalam Dump Truck				
3.	Dump Truck mengangkut material hasil galian - Ke disposal area	L1	0.50	km	
<b>III</b>	<b>PERHITUNGAN</b>				
<b>1.</b>	<b>BAHAN :</b> Tidak ada bahan yang diperlukan				
<b>2.</b>	<b>ALAT :</b> <b>Excavator, 150-135 HP</b>				
	Kapasitas Bucket	V	0.80	m3	
	Faktor Bucket	Fb	1.00	-	kondisi sedang
	Faktor efisiensi alat	Fa	0.83	-	kondisi baik
	Faktor konversi galian	Fv	0.90	-	Normal
	Faktor konversi bahan (asli-lepas)	Fk	1.00	-	Pasir asli
	Waktu siklus	Ts			
	- Waktu mengeruk material, swing+muat ke DT	T1	0.37	menit	Ringan, 180°, DT
		Ts	0.37	menit	
	Kapasitas Produksi / jam = $(V \times Fb \times Fa \times 60) / (Ts \times Fk \times Fv)$	Q1	120.73	m3	
	Koefisien alat / m3 = $(1 : Q1)$		0.0083	jam	
	<b>Dump Truck, 7 ton</b>				
	Kapasitas bak	V	5.00	m3	
	Berat volume bahan (lepas)	D	1.40	ton/m3	berat jenis pasir
	Faktor efisiensi alat	Fa	0.83	-	kondisi baik
	Kecepatan rata-rata bermuatan	V1	20.00	km/jam	menanjak menurun
	Kecepatan rata-rata kosong	V2	30.00	km/jam	menanjak menurun
	Faktor konversi bahan	Fk	1.00	-	normal
	<b>Pengangkutan ke spoil bank</b>				
	Waktu siklus	Ts			
	- Waktu tempuh isi = $(L1 / V1) \times 60$	T2	1.50	menit	
	- Waktu tempuh kosong = $(L1 / V2) \times 60$	T3	1.00	menit	
	- Waktu lain-lain	T4	2.00	menit	
		Ts	4.50	menit	
	Kapasitas Produksi / jam = $(V \times Fa \times 60) / (D \times Ts \times Fk)$	Q2	39.52	m3	
	Koefisien alat / m3 = $(1 : Q2)$		0.0253	jam	
<b>3.</b>	<b>TENAGA :</b>				
	<b>Produksi menentukan : Excavator</b>				
	Produksi / hari = $Tk \times Q1$	Q1	120.73	m3/jam	
		Qt	845.09	m3/jam	
	Kebutuhan tenaga :				
	- Mandor	M	0.20		
	- Pekerja	PT	2.00		
	Koefisien :				
	- Mandor = $(Tk \times M) : Qt$		0.0017	jam	
	- Pekerja = $(Tk \times M) : Qt$		0.0166	jam	

**ANALISA PRODUKSIALAT**

**Jenis Pekerjaan : Galian Pasir**  
**(secara mekanis, hasil galian ditaruh disekitar)**

No.	Uraian	Kode	Koefisien	Satuan	Keterangan
<b>I</b>	<b>ASUMSI</b>				
1.	Menggunakan alat berat (cara mekanis)				
2.	Waktu jam kerja efektif	Tk	7.00	jam	
<b>II</b>	<b>URUTAN KERJA</b>				
1.	Menentukan Kap. Bucket, V, Fa, Fv (kedalaman galian)				
2.	Menghitung waktu siklus untuk memuat material di hasil galian				
3.	Menghitung kap. Produksi untuk menentukan besaran koefisien alat				
<b>III</b>	<b>PERHITUNGAN</b>				
<b>1.</b>	<b>BAHAN :</b>				
	Tidak ada bahan yang diperlukan				
<b>2.</b>	<b>ALAT :</b>				
	<b>Excavator, 150-135 HP</b>				
	Kapasitas Bucket	V	0.80	m3	
	Faktor Bucket	Fb	1.00	-	kondisi sedang
	Faktor efisien alat	Fa	0.83	-	kondisi baik
	Faktor konversi galian	Fv	0.90	-	Normal
	Faktor konversi bahan (asli-lepas)	Fk	1.00	-	Pasir asli
	Waktu siklus	Ts			
	- Waktu mengeruk material, swing+muat ke DT	T1	0.37	menit	Ringan,180 <sup>o</sup> ,DT
		Ts	0.37	menit	
	$Kapasitas\ Produksi\ /jam = (V \times Fb \times Fa \times 60) / (Ts \times Fk \times Fv)$	Q1	120.73	m3	
	$Koefisien\ alat\ / m3 = (1 : Q1)$		0.0083	jam	
<b>3.</b>	<b>TENAGA :</b>				
	<b>Produksi menentukan : Excavator</b>	Q1	120.73	m3/jam	
	Produksi / hari = Tk x Q1	Qt	845.09	m3/jam	
	Kebutuhan tenaga :				
	- Mandor	M	0.20		
	- Pekerja	P	2.00		
	Koefisien :				
	- Mandor = (Tk x M) : Qt		0.0017	jam	
	- Pekerja = (Tk x P) : Qt		0.0166	jam	

**ANALISA PRODUKSIALAT**

Jenis Pekerjaan

: Timbunan Pasir Kembali  
(Material dari hasil galian)

Satuan Pembayaran

: m3

No.	Uraian	Kode	Koefisien	Satuan	Keterangan
<b>I</b>	<b>ASUMSI</b>				
1.	Menggunakan alat berat (cara mekanis)				
2.	Pekerjaan meliputi penimbunan, penghamparan danperapihan				
3.	Waktu jam kerja efektif	Tk	7.00	jam	
<b>II</b>	<b>URUTAN KERJA</b>				
1.	Material timbunan diambil dari bekas galian dengan Excavator dan memuat ke dalam Dum Truck	L	0.50	km	
2.	Dump truck mengangkut pasir ke area timbunan				
3.	Material disebar dengan Excavator				
<b>III</b>	<b>PERHITUNGAN</b>				
1.	<b>Excavator, 150-135 HP</b>				
	Kapasitas Bucket	V	0.80	m3	
	Faktor Bucket	Fb	1.00		kondisi sedang
	Faktor efisien alat	Fa	0.83		kondisi baik
	Faktor konversi galian	Fv	0.90		Normal
	Faktor konversi bahan	Fk	1.00	-	Pasir asli
	Waktu siklus	Ts			
	waktu standar (menggali-swing-muat-swing kembali)	Ts1	0.37	menit	
	Kapasitas Produksi / jam	Q1	120.73	m3	
	Koefisien alat / m3 = (1 : Q1)		0.0083	jam	
2.	<b>Dump Truck, 7 ton</b>				
	Kapasitas bak	V	5.00	ton/m3	
	Berat volume bahan	D	1.40	ton/m3	
	Faktor efisiensi alat	Fa	0.83	-	kondisi baik sekali
	Kecepatan rata-rata bermuatan	V1	20.00	km/jam	menanjak-menurun
	Kecepatan rata-rata kosong	V2	30.00	km/jam	tabel 8
	<b>Pengangkutan</b>				
	Waktu siklus	Ts			
	- Waktu tempuh isi	T1	1.50	menit	
	- Waktu tempuh kosong	T2	1.00	menit	
	- Waktu lain-lain (waktu = (penumpahan & ambil posisi siap dimuat kembali)	T3	2.00	menit	1,25 - 1,65 menit
		Ts	4.50	menit	
	Kapasitas Produksi / jam	Q2	55.33	m3	
	Koefisien alat / m3 = (1 : Q2)		0.0181	jam	
3.	<b>Mesin Stamper</b>				
	Kecepatan lintasan rata-rata pematatan	V	1.00	km/jam	
	Faktor efisiensi alat	Fa	0.83	m	
	Tebal pematatan	t	0.20	m	
	Lebar telapak	Lbr	0.50	m	
	Jumlah lapisan	N	1.00	m	
	Banyak Tumbukan	n	6.00	tumbukan	
	Kapasitas Produksi / jam	Q5	13.83	m3	
	Koefisien alat / m3 = (1 : Q5)		0.0723	Jam	
3.	<b>TENAGA :</b>				
	<b>Produksi menentukan : Excavator</b>				
	Produksi / hari = Tk x Excavator, 150-135 HP	Excavator, 150-135 HP	120.73	m3/jam	
		Qt	845.09		
	Kebutuhan tenaga :				
	- Mandor	M	0.20		
	- Pekerja	P	2.00		
	- Tukang	T	1.00		
	Koefisien :				
	- Mandor = (Tk x M) : Qt		0.0017	jam	
	- Pekerja = (Tk x P) : Qt		0.0166	jam	
	- Tukang = (Tk x T) : Qt		0.0083	jam	

**LAMPIRAN**  
**REKAPITULASIANALISIS HARGA SATUAN PEKERJAAN**  
**( A H S P )**

No. Analisis	Uraian Pekerjaan	Satuan	Harga Satuan (Rp)
<b>F</b>	<b>CONCRETE WORK</b>		
F.01	Concrete Making and Casting $f_c' = 30$ Mpa (K 350) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	1,289,590
F.02	Concrete Making and Casting $f_c' = 20$ Mpa (K 225) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	1,123,910
F.03	Concrete Making and Casting $f_c' = 20$ Mpa (K 225) Mechanical Transported radius 2000 m	m3	1,109,990
F.04	Concrete Making and Casting $f_c' = 15$ Mpa (K 175) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	1,060,070
F.05	Concrete Making and Casting $f_c' = 10$ Mpa (K 125) Mechanical Transported radius 2000 m	m3	986,860
F.06	Manufacturing and Casting of 1 m3 of low quality concrete $f_c' = 10$ Mpa; W/C = 0.700 Semi Mechanical	m3	959,310
F.07	Cyclops Concrete 60% Concrete $f_c' = 15$ Mpa: 40% Stone, with Concrete Pump (CP)	m3	842,630
F.08	Cyclops Concrete 60% Concrete $f_c' = 15$ Mpa: 40% Stone	m3	828,710
F.09	1 kg Slab reinforcement for BjTP or BjTS diameter > 12 mm Semi-Mechanical m	Kg	15,100
F.10	1 m2 Exposed Formwork for Concrete Floor Slabs with Multiflex 18 mm (TP), JaTm 0.60 m	m2	127,830
F.11	1 m2 Regular Concrete Floor Formwork with Multiflex 12 mm or 18 mm (TP)	m2	88,660
F.12	1 m2 Concrete Floor Formwork Scaffolding with 5/7 cm Rafters 4.00 m high, JaTm 0.60 m	m2	117,400
F.13	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	143,250
F.14	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	95,770
F.15	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50	m2	96,260
F.16	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	6,680
F.17	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	4,460
F.18	Construction Joint Filler	m3	81,370
F.19	Geotextile, Medium thickness (> 400 to < 800 gr), Manual	m2	38,590

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.01  
 Concrete Making and Casting  $f_c' = 30$  Mpa (K 350)  
 Macam pekerjaan : Mechanically Transported within a radius of 2000 m with a  
 Concrete Pump (CP)  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 1,289,590

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0.7028	13,037	9,163
2.	Tukang Batu	L. 03	orang/jam	0.1406	13,037	1,833
3.	Kepala Tukang Batu	L. 9	orang/jam	0.0141	13,571	191
4.	Mandor	L. 13	orang/jam	0.0703	14,286	1,004
<b>Jumlah Harga Tenaga Kerja</b>						<b>12,190</b>
<b>B</b>	<b>Bahan</b>					
1.	Semen Portland	M. 73	kg	457.00	1,523	695,783
2.	Pasir Beton	M. 47	m3	681.00	141	95,781
3.	Kerikil Beton	M. 35	m3	1,009.00	226	228,067
4.	Air	M. 01	liter	202.00	-	-
<b>Jumlah Harga Bahan</b>						<b>1,019,630</b>
<b>C</b>	<b>Peralatan</b>					
1.	Wheel Loader, 1.0-1.6 m3	E. 23	jam	0.0155	491,000	7,608
2.	Batching Plant, 60 m3/jam	E. 02	jam	0.0201	1,019,600	20,474
3.	Agitator Truck, 8 m3	E. 01	jam	0.0819	1,096,000	89,789
4.	Concrete Pump Trailer, 60 m3/jam	E. 04	jam	0.0201	630,300	12,657
5.	Concrete Vibrator	E. 05	jam	0.1854	54,000	10,009
<b>Jumlah Harga Peralatan</b>						<b>140,536</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>1,172,356</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>117,236</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m3 (D + E)</b>					<b>1,289,590</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.02  
 Concrete making and Casting  $f_c = 20 \text{ mpa}$  (K 225)  
 Macam pekerjaan : Mechanically Transported within a radius of 2000 m with a  
 Concrete Pump (CP)  
 Kuantitas pekerjaan :  $1 \text{ m}^3$   
 Satuan pengukuran :  $\text{m}^3$   
 Harga Satuan : Rp 1,123,910

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0.7028	13,037	9,163
2.	Tukang Batu	L. 03	orang/jam	0.1406	13,037	1,833
3.	Kepala Tukang Batu	L. 9	orang/jam	0.0141	13,571	191
4.	Mandor	L. 13	orang/jam	0.0703	14,286	1,004
<b>Jumlah Harga Tenaga Kerja</b>						<b>12,190</b>
<b>B</b>	<b>Bahan</b>					
1.	Semen Portland	M. 73	kg	348.00	1,523	529,830
2.	Pasir Beton	M. 47	m <sup>3</sup>	790.00	141	111,111
3.	Kerikil Beton	M. 35	m <sup>3</sup>	1,009.00	226	228,067
4.	Air	M. 01	liter	202.00	-	-
<b>Jumlah Harga Bahan</b>						<b>869,008</b>
<b>C</b>	<b>Peralatan</b>					
1.	Wheel Loader, 1.0-1.6 m <sup>3</sup>	E. 23	jam	0.0155	491,000	7,608
2.	Batching Plant, 60 m <sup>3</sup> /jam	E. 02	jam	0.0201	1,019,600	20,474
3.	Agitator Truck, 8 m <sup>3</sup>	E. 01	jam	0.0819	1,096,000	89,789
4.	Concrete Pump Trailer, 60 m <sup>3</sup> /jam	E. 04	jam	0.0201	630,300	12,657
5.	Concrete Vibrator	E. 05	jam	0.1854	54,000	10,009
<b>Jumlah Harga Peralatan</b>						<b>140,536</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>1,021,734</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>102,173</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>3</sup> (D + E)</b>					<b>1,123,910</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.03  
 Macam pekerjaan : Concrete Making and Casting  $f_c' = 20$  Mpa (K 225)  
 : Mechanical Transported radius 2000 m  
 Kuantitas pekerjaan :  $1 \text{ m}^3$   
 Satuan pengukuran :  $\text{m}^3$   
 Harga Satuan : Rp 1,109,990

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0.7028	13,037	9,163
2.	Tukang Batu	L. 03	orang/jam	0.1406	13,037	1,833
3.	Kepala Tukang Batu	L. 9	orang/jam	0.0141	13,571	191
4.	Mandor	L. 13	orang/jam	0.0703	14,286	1,004
<b>Jumlah Harga Tenaga Kerja</b>						<b>12,190</b>
<b>B</b>	<b>Bahan</b>					
1.	Semen Portland	M. 73	kg	348.00	1,523	529,830
2.	Pasir Beton	M. 47	m <sup>3</sup>	790.00	141	111,111
3.	Kerikil Beton	M. 35	m <sup>3</sup>	1,009.00	226	228,067
4.	Air	M. 01	liter	202.00	-	-
<b>Jumlah Harga Bahan</b>						<b>869,008</b>
<b>C</b>	<b>Peralatan</b>					
1.	Wheel Loader, 1.0-1.6 m <sup>3</sup>	E. 23	jam	0.0155	491,000	7,608
2.	Batching Plant, 60 m <sup>3</sup> /jam	E. 02	jam	0.0201	1,019,600	20,474
3.	Agitator Truck, 8 m <sup>3</sup>	E. 01	jam	0.0819	1,096,000	89,789
4.	Concrete Vibrator	E. 05	jam	0.1854	54,000	10,009
<b>Jumlah Harga Peralatan</b>						<b>127,880</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>1,009,077</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>100,908</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>3</sup> (D + E)</b>					<b>1,109,990</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.04  
 Concrete Making and Casting  $f_c' = 15$  Mpa (K 175)  
 Macam pekerjaan : Mechanically Transported within a radius of 2000 m with a  
 Concrete Pump (CP)  
 Kuantitas pekerjaan :  $1 \text{ m}^3$   
 Satuan pengukuran :  $\text{m}^3$   
 Harga Satuan : Rp 1,060,070

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0.7028	13,037	9,163
2.	Tukang Batu	L. 03	orang/jam	0.1406	13,037	1,833
3.	Kepala Tukang Batu	L. 9	orang/jam	0.0141	13,571	191
4.	Mandor	L. 13	orang/jam	0.0703	14,286	1,004
<b>Jumlah Harga Tenaga Kerja</b>						<b>12,190</b>
<b>B</b>	<b>Bahan</b>					
1.	Semen Portland	M. 73	kg	306.00	1,523	465,885
2.	Pasir Beton	M. 47	m <sup>3</sup>	832.00	141	117,018
3.	Kerikil Beton	M. 35	m <sup>3</sup>	1,009.00	226	228,067
4.	Air	M. 01	liter	202.00	-	-
<b>Jumlah Harga Bahan</b>						<b>810,970</b>
<b>C</b>	<b>Peralatan</b>					
1.	Wheel Loader, 1.0-1.6 m <sup>3</sup>	E. 23	jam	0.0155	491,000	7,608
2.	Batching Plant, 60 m <sup>3</sup> /jam	E. 02	jam	0.0201	1,019,600	20,474
3.	Agitator Truck, 8 m <sup>3</sup>	E. 01	jam	0.0819	1,096,000	89,789
4.	Concrete Pump Trailer, 60 m <sup>3</sup> /jam	E. 04	jam	0.0201	630,300	12,657
5.	Concrete Vibrator	E. 05	jam	0.1854	54,000	10,009
<b>Jumlah Harga Peralatan</b>						<b>140,536</b>
<b>F</b>	<b>Jumlah (A + B + C)</b>					<b>963,696</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x F)</b>					<b>96,370</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - 1 m<sup>3</sup> (F + E)</b>					<b>1,060,070</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.05  
 Macam pekerjaan : Concrete Making and Casting  $f_c' = 10$  Mpa (K 125)  
 : Mechanical Transported radius 2000 m  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 986,860

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0.7028	13,037	9,163
2.	Tukang Batu	L. 03	orang/jam	0.1406	13,037	1,833
3.	Kepala Tukang Batu	L. 9	orang/jam	0.0141	13,571	191
4.	Mandor	L. 13	orang/jam	0.0703	14,286	1,004
<b>Jumlah Harga Tenaga Kerja</b>						<b>12,190</b>
<b>B</b>	<b>Bahan</b>					
1.	Semen Portland	M. 73	kg	267.00	1,523	406,508
2.	Pasir Beton	M. 47	m3	871.00	141	122,504
3.	Kerikil Beton	M. 35	m3	1,009.00	226	228,067
4.	Air	M. 01	liter	202.00	-	-
<b>Jumlah Harga Bahan</b>						<b>757,078</b>
<b>C</b>	<b>Peralatan</b>					
1.	Wheel Loader, 1.0-1.6 m3	E. 23	jam	0.0155	491,000	7,608
2.	Batching Plant, 60 m3/jam	E. 02	jam	0.0201	1,019,600	20,474
3.	Agitator Truck, 8 m3	E. 01	jam	0.0819	1,096,000	89,789
4.	Concrete Vibrator	E. 05	jam	0.1854	54,000	10,009
<b>Jumlah Harga Peralatan</b>						<b>127,880</b>
<b>F</b>	<b>Jumlah (A + B + C)</b>					<b>897,147</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x F)</b>					<b>89,715</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - 1 m3 (F + E)</b>					<b>986,860</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.06  
 Macam pekerjaan : Manufacturing and Casting of 1 m<sup>3</sup> of low quality concrete fc' = 10 Mpa; W/C = 0.700 Semi Mechanical  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 959,310

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	1.0000	91,259	91,259
2.	Tukang Batu	L. 03	orang/hari	0.2500	91,259	22,815
3.	Kepala Tukang Batu	L. 9	orang/hari	0.0250	95,000	2,375
4.	Mandor	L. 13	orang/hari	0.1000	100,000	10,000
<b>Jumlah Harga Tenaga Kerja</b>						<b>126,448</b>
<b>B</b>	<b>Bahan</b>					
1.	Semen Portland	M. 73	kg	279.0000	1,523	424,778
2.	Pasir Beton	M. 47	m <sup>3</sup>	0.6236	200,000	124,714
3.	Kerikil Beton	M. 35	m <sup>3</sup>	0.6733	290,000	195,267
4.	Air	M. 01	liter	195.0000	-	-
<b>Jumlah Harga Bahan</b>						<b>744,758</b>
<b>C</b>	<b>Peralatan</b>					
1.	Molen, 0.35 m <sup>3</sup>	E. 17	jam	0.0211	42,200	889
<b>Jumlah Harga Peralatan</b>						<b>889</b>
<b>F</b>	<b>Jumlah (A + B + C)</b>					<b>872,096</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x F)</b>					<b>87,210</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - 1 m<sup>3</sup> (F + E)</b>					<b>959,310</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.07  
 Macam pekerjaan : Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Stone,  
 with Concrete Pump (CP)  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 842,630

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0.7028	13,037	9,163
2.	Tukang Batu	L. 03	orang/jam	0.1406	13,037	1,833
3.	Kepala Tukang Batu	L. 9	orang/jam	0.0141	13,571	191
4.	Mandor	L. 13	orang/jam	0.0703	14,286	1,004
<b>Jumlah Harga Tenaga Kerja</b>						<b>12,190</b>
<b>B</b>	<b>Bahan</b>					
1.	Batu Belah	M. 7	m3	0.528	240,000	126,720
1.	Semen Portland	M. 73	kg	183.60	1,523	279,531
2.	Pasir Beton	M. 47	m3	499.20	141	70,211
3.	Kerikil Beton	M. 35	m3	605.40	226	136,840
4.	Air	M. 01	liter	121.20	-	-
<b>Jumlah Harga Bahan</b>						<b>613,302</b>
<b>C</b>	<b>Peralatan</b>					
1.	Wheel Loader, 1.0-1.6 m3	E. 23	jam	0.0155	491,000	7,608
2.	Batching Plant, 60 m3/jam	E. 02	jam	0.0201	1,019,600	20,474
3.	Agitator Truck, 8 m3	E. 01	jam	0.0819	1,096,000	89,789
4.	Concrete Pump Trailer, 60 m3/jam	E. 04	jam	0.0201	630,300	12,657
5.	Concrete Vibrator	E. 05	jam	0.1854	54,000	10,009
<b>Jumlah Harga Peralatan</b>						<b>140,536</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>766,028</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>76,603</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m3 (D + E)</b>					<b>842,630</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.08  
 Macam pekerjaan : Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Stone

Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 828,710

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0.7028	13,037	9,163
2.	Tukang Batu	L. 03	orang/jam	0.1406	13,037	1,833
3.	Kepala Tukang Batu	L. 9	orang/jam	0.0141	13,571	191
4.	Mandor	L. 13	orang/jam	0.0703	14,286	1,004
<b>Jumlah Harga Tenaga Kerja</b>						<b>12,190</b>
<b>B</b>	<b>Bahan</b>					
1.	Batu Belah	M. 7	m3	0.528	240,000	126,720
1.	Semen Portland	M. 73	kg	183.60	1,523	279,531
2.	Pasir Beton	M. 47	m3	499.20	141	70,211
3.	Kerikil Beton	M. 35	m3	605.40	226	136,840
4.	Air	M. 01	liter	121.20	-	-
<b>Jumlah Harga Bahan</b>						<b>613,302</b>
<b>C</b>	<b>Peralatan</b>					
1.	Wheel Loader, 1.0-1.6 m3	E. 23	jam	0.0155	491,000	7,608
2.	Batching Plant, 60 m3/jam	E. 02	jam	0.0201	1,019,600	20,474
3.	Agitator Truck, 8 m3	E. 01	jam	0.0819	1,096,000	89,789
4.	Concrete Vibrator	E. 05	jam	0.1854	54,000	10,009
<b>Jumlah Harga Peralatan</b>						<b>127,880</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>753,372</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>75,337</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m3 (D + E)</b>					<b>828,710</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.09  
 Macam pekerjaan : 1 kg Slab reinforcement for BjTP or BjTS diameter > 12 mm  
 : Semi-Mechanical method (cutting, bending and fitting)  
 Kuantitas pekerjaan : 1 Kg  
 Satuan pengukuran : Kg  
 Harga Satuan : Rp 15,100

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.00080	91,259	73
2.	Tukang Besi	L. 04	orang/hari	0.00040	91,259	37
3.	Kepala Tukang Besi	L. 10	orang/hari	0.00004	95,000	4
4.	Mandor	L. 13	orang/hari	0.00008	100,000	8
<b>Jumlah Harga Tenaga Kerja</b>						<b>121</b>
<b>B</b>	<b>Bahan</b>					
1.	Besi Beton Ulir	M. 12	kg	1.020	13,000	13,260
2.	Kawat Ikat Beton (Bendrat)	M. 33	kg	0.015	21,000	315
<b>Jumlah Harga Bahan</b>						<b>13,575</b>
<b>C</b>	<b>Peralatan</b>					
1.	bar bender	E. 14	Hari	0.0002	70,000	14
2.	bar cutter	E. 15	Hari	0.0002	70,000	14
<b>Jumlah Harga Peralatan</b>						<b>28</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>13,724</b>
<b>E</b>	<b>Overhead &amp; Profit (10%x D)</b>					<b>1,372</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - 1 Kg (D + E)</b>					<b>15,100</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.10  
 Macam pekerjaan : 1 m<sup>2</sup> Exposed Formwork for Concrete Floor Slabs with  
 Multiflex 18 mm (TP), JaTm 0.60 m  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 127,830

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.3000	91,259	27,378
2.	Tukang Kayu	L. 07	orang/hari	0.3000	91,259	27,378
3.	Kepala Tukang Kayu	L. 12	orang/hari	0.0300	95,000	2,850
4.	Mandor	L. 13	orang/hari	0.0300	100,000	3,000
<b>Jumlah Harga Tenaga Kerja</b>						<b>60,605</b>
<b>B</b>	<b>Bahan</b>					
1.	Multipleks, 18 mm	M. 38	lembar	0.1280	207,300	26,534
2.	Kaso 5/7 cm	M. 32	m <sup>3</sup>	0.0060	2,811,900	16,871
3.	Paku 5 cm dan 7 cm	M. 40	kg	0.2800	20,000	5,600
4.	Minyak bekisting	M. 37	liter	0.2500	26,400	6,600
<b>Jumlah Harga Bahan</b>						<b>55,606</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>116,211</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>11,621</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>2</sup> (D + E)</b>					<b>127,830</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.11  
 Macam pekerjaan : 1 m<sup>2</sup> Regular Concrete Floor Formwork with Multiflex 12 mm or 18 mm (TP)  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 88,660

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.2000	91,259	18,252
2.	Tukang Kayu	L. 07	orang/hari	0.1000	91,259	9,126
3.	Kepala Tukang Kayu	L. 12	orang/hari	0.0100	95,000	950
4.	Mandor	L. 13	orang/hari	0.0200	100,000	2,000
<b>Jumlah Harga Tenaga Kerja</b>						<b>30,328</b>
<b>B</b>	<b>Bahan</b>					
1.	Multipleks, 18 mm	M. 38	lembar	0.1280	207,300	26,534
2.	Kaso 5/7 cm	M. 32	m <sup>3</sup>	0.0050	2,811,900	14,060
3.	Paku 5 cm dan 7 cm	M. 40	kg	0.2200	20,000	4,400
4.	Minyak bekisting	M. 37	liter	0.2000	26,400	5,280
<b>Jumlah Harga Bahan</b>						<b>50,274</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>80,602</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>8,060</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>2</sup> (D + E)</b>					<b>88,660</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.12  
 Macam pekerjaan : 1 m<sup>2</sup> Concrete Floor Formwork Scaffolding with 5/7 cm Rafters 4.00 m high, JaTm 0.60 m  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 117,400

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.3000	91,259	27,378
2.	Tukang Kayu	L. 07	orang/hari	0.1500	91,259	13,689
3.	Kepala Tukang Kayu	L. 12	orang/hari	0.0150	95,000	1,425
4.	Mandor	L. 13	orang/hari	0.0300	100,000	3,000
<b>Jumlah Harga Tenaga Kerja</b>						<b>45,491</b>
<b>B</b>	<b>Bahan</b>					
1.	Kaso 5/7 cm	M. 32	m <sup>3</sup>	0.0200	2,811,900	56,238
2.	Paku 5 cm dan 7 cm	M. 40	kg	0.2500	20,000	5,000
<b>Jumlah Harga Bahan</b>						<b>61,238</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>106,729</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>10,673</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>2</sup> (D + E)</b>					<b>117,400</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.13  
 Macam pekerjaan : 1 m<sup>2</sup> Exposed Concrete Wall Formwork with 18 mm Multiflex  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 143,250

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.3600	91,259	32,853
2.	Tukang Kayu	L. 07	orang/hari	0.3600	91,259	32,853
3.	Kepala Tukang Kayu	L. 12	orang/hari	0.0360	95,000	3,420
4.	Mandor	L. 13	orang/hari	0.0360	100,000	3,600
<b>Jumlah Harga Tenaga Kerja</b>						<b>72,726</b>
<b>B</b>	<b>Bahan</b>					
1.	Multipleks, 18 mm	M. 38	lembar	0.1280	207,300	26,534
2.	Kaso 5/7 cm	M. 32	m <sup>3</sup>	0.0070	2,811,900	19,683
3.	Paku 5 cm dan 7 cm	M. 40	kg	0.3000	20,000	6,000
4.	Minyak bekisting	M. 37	liter	0.2000	26,400	5,280
<b>Jumlah Harga Bahan</b>						<b>57,498</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>130,224</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>13,022</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>2</sup> (D + E)</b>					<b>143,250</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.14  
 Macam pekerjaan : 1 m<sup>2</sup> Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 95,770

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.2400	91,259	21,902
2.	Tukang Kayu	L. 07	orang/hari	0.1200	91,259	10,951
3.	Kepala Tukang Kayu	L. 12	orang/hari	0.0120	95,000	1,140
4.	Mandor	L. 13	orang/hari	0.0240	100,000	2,400
<b>Jumlah Harga Tenaga Kerja</b>						<b>36,393</b>
<b>B</b>	<b>Bahan</b>					
1.	Multipleks, 18 mm	M. 38	lembar	0.1280	207,300	26,534
2.	Kaso 5/7 cm	M. 32	m <sup>3</sup>	0.0050	2,811,900	14,060
3.	Paku 5 cm dan 7 cm	M. 40	kg	0.2400	20,000	4,800
4.	Minyak bekisting	M. 37	liter	0.2000	26,400	5,280
<b>Jumlah Harga Bahan</b>						<b>50,674</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>87,067</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>8,707</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>2</sup> (D + E)</b>					<b>95,770</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.15  
 Macam pekerjaan : 1 m<sup>2</sup> Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 96,260

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.360	91,259	32,853
2.	Tukang Kayu	L. 07	orang/hari	0.180	91,259	16,427
3.	Kepala Tukang Kayu	L. 12	orang/hari	0.018	95,000	1,710
4.	Mandor	L. 13	orang/hari	0.036	100,000	3,600
<b>Jumlah Harga Tenaga Kerja</b>						<b>54,590</b>
<b>B</b>	<b>Bahan</b>					
1.	Kaso 5/7 cm	M. 32	m <sup>3</sup>	0.010	2,811,900	28,119
2.	Paku 5 cm dan 7 cm	M. 40	kg	0.240	20,000	4,800
<b>Jumlah Harga Bahan</b>						<b>32,919</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>87,509</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>8,751</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>2</sup> (D + E)</b>					<b>96,260</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.16  
 Macam pekerjaan : Carefully dismantle 1 m2 of Formwork and Scaffolding  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 6,680

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.0600	91,259	5,476
2.	Mandor	L. 13	orang/hari	0.0060	100,000	600
<b>Jumlah Harga Tenaga Kerja</b>						<b>6,076</b>
<b>B</b>	<b>Bahan</b>					
<b>Jumlah Harga Bahan</b>						<b>-</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>6,076</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>608</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m2 (D + E)</b>					<b>6,680</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.17  
 Macam pekerjaan : Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 4,460

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.0400	91,259	3,650
2.	Mandor	L. 13	orang/hari	0.0040	100,000	400
<b>Jumlah Harga Tenaga Kerja</b>						<b>4,050</b>
<b>B</b>	<b>Bahan</b>					
<b>Jumlah Harga Bahan</b>						<b>-</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>4,050</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>405</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m2 (D + E)</b>					<b>4,460</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.18  
 Macam pekerjaan : Construction Joint Filler  
 Kuantitas pekerjaan : 1 m3  
 Satuan pengukuran : m3  
 Harga Satuan : Rp 81,370

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.0460	91,259	4,198
2.	Tukang	L. 02	orang/hari	0.0230	91,259	2,099
3.	Mandor	L. 13	orang/hari	0.0046	100,000	460
<b>Jumlah Harga Tenaga Kerja</b>						<b>6,757</b>
<b>B</b>	<b>Bahan</b>					
1.	Joint Filler, t = 20 mm	M. 28	m3	1.0200	65,900	67,218
<b>Jumlah Harga Bahan</b>						<b>67,218</b>
<b>C</b>	<b>Peralatan</b>					
1.	Grouting Pump 0,50-1,5 m3/jam, 25 Bar	E. 11	Hari	0.0230	-	-
2.	Diesel Generator, 2 kVA	E. 12	Hari	0.0230	-	-
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>73,975</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>7,397</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m3 (D + E)</b>					<b>81,370</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : F.19  
 Macam pekerjaan : Geotextile, Medium thickness (> 400 to < 800 gr), Manual  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 38,590

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.0160	91,259	1,460
2.	Tukang	L. 02	orang/hari	0.0032	91,259	292
3.	Mandor	L. 13	orang/hari	0.0016	100,000	160
<b>Jumlah Harga Tenaga Kerja</b>						<b>1,912</b>
<b>B</b>	<b>Bahan</b>					
1.	Geotextile Non Woven 500gr	M. 22	m2	1.140	29,100	33,174
<b>Jumlah Harga Bahan</b>						<b>33,174</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>35,086</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>3,509</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m2 (D + E)</b>					<b>38,590</b>

**ANALISA PRODUKSIALAT**
**Jenis Pekerjaan : Beton**  
**Satuan Pembayaran : m3**

No.	Uraian	Kode	Koefisien	Satuan	Keterangan
<b>I</b>	<b>ASUMSI</b>				
1	Jam Kerja Efektif per Hari	Tk	7.00	Jam	
2	Penggunaan loader untuk pengisian silo semen, pasir agregat				
3	Jarak angkut antara 35 m sampai 50 m (maksimum)				
4	Berat isi estimasi untuk :				
	a PC	PC	1.28	ton/m <sup>3</sup>	
	b Pasir Beton	PB	1.37	ton/m <sup>3</sup>	
	c Pasir	Ps	1.25	ton/m <sup>3</sup>	
	d Kerikil Beton	KB	1.26	ton/m <sup>3</sup>	
	e Tanah	T	1.16	ton/m <sup>3</sup>	
<b>II</b>	<b>URUTAN KERJA</b>				
1	Wheel Loader memuat Semen, Pasir dan Agregat ke Conveyor Silo Batching Plant (BP) beton				
2	BP mencampur, mengaduk dan menuangkan campuran beton ke Truck Mixer yang kemudian diangkut ke Lokasi Pekerjaan				
3	Di lokasi pekerjaan campuran beton dimasukkan ke Pompa Beton yang dipompakan ke lokasi pengecoran pada jarak horizontal 100 m atau sampai ketinggian 50 m pakai pompa beton Pemadatan beton menggunakan vibrator beton dan finishing elevasi permukaan beton dibantu tenaga kerja T + P				
<b>III</b>	<b>PERHITUNGAN</b>				
<b>A</b>	<b>ALAT</b>				
<b>1</b>	<b>Wheel Loader, 1.0-1.6 m3</b>				
	Kapasitas bucket	V	1.62	m3	
	Faktor bucket	Fb	1.00		kondisi mudah
	Faktor efisiensi alat	Fa	0.83		kondisi baik sekali
	Waktu Siklus :				
	- Waktu tetap (Z) = Waktu mengisi + putar + menumpuk	T.1	0.55	menit	V-Loading
	- Waktu mengisi material Bahan baku campuran beton dari SP	T.2	0.35	menit	
	- Waktu Variabel				
	- Mundur Kosong = 1 x 10 m / 15 km/jam	T.4	0.04	menit	kembali ke posisi se
	- Maju Kosong = 1 x 25 m / 15 km/jam	T.5	0.10	menit	
	- Mundur Isi = 1 x 10 m / 15 km/jam	T.6	0.06	menit	
	- Maju Isi = 1 x 10 m / 15 km/jam	T.7	0.15	menit	
		Ts.1	1.25	menit	
	Kapasitas Produksi / jam = $\frac{(V \times Fa \times 60)}{Ts}$	Q1	64.54	m3/jam	
	Koefisien alat/m3 = (1 : Q1)		0.0155	jam	
<b>2</b>	<b>Batching Plant, 60 m3/jam</b>				
	Kapasitas produksi alat	V	60.00	m3	
	Faktor Efisiensi alat	Fa	0.83		
	Kapasitas Produksi / jam = V x Fa	Q2	49.80	m3/jam	
	Koefisien alat/m3 = (1 : Q2)		0.0201	jam	
<b>3</b>	<b>Agitator Truck, 8 m3</b>				
	Kapasitas mixer	V	8.00	m3	
	Faktor Efisiensi alat	Fa	0.83		
	Jarak batching plant - lokasi	L	2.00	km	
	Kecepatan rata-rata isi	v1	20.00	km/jam	
	Kecepatan rata-rata kosong	v2	30.00	km/jam	
	Waktu siklus	Ts			
	- Waktu antri =	T1	5.00	menit	
	- Waktu muat = (V : Q2) x 60	T2	9.64	menit	

No.	Uraian	Kode	Koefisien	Satuan	Keterangan
	- Waktu tempuh isi = $(L : v1) \times 60$ - Waktu tempuh kosong = $(L : v2) \times 60$ - Waktu Doking menuangkan ke pompa beton	T3 T4 T5 Ts.2	6.00 4.00 8.00 32.64	menit menit menit menit	
	Kapasitas Produksi / jam = $\frac{V \times Fa \times 60}{Ts.2}$	Q3	12.21	m3/jam	
	Koefisien alat/m3 = $(1 : Q3)$		<b>0.0819</b>	jam	
<b>4</b>	<b>Concrete Pump Trailer, 60 m3/jam</b>				
	Kapasitas alat	V	60.00	m3	
	Faktor efisiensi alat	Fa	0.83		
	Kapasitas Produksi / jam = $V \times Fa$	Q4	49.80	m3	
	Koefisien alat/m3 =		<b>0.0201</b>	jam	
<b>5</b>	<b>Concrete Vibrator</b>				
	Kapasitas alat	Cp	6.50	m3/jam	
	Faktor efisiensi alat	Fa	0.83		
	Kapasitas Produksi / jam = $Cp \times Fa$	Q5	5.40	m3	
	Koefisien alat/m3		<b>0.1854</b>	jam	
<b>B</b>	<b>TENAGA</b>				
	<b>Produksi : Batching Plant, 60 m3/jam</b>	Q2	49.80	m3/jam	
	Produksi / hari				
	Kebutuhan tenaga :				
	- Pekerja	P	3.00	orang	
	- Mandor	M	0.30	orang	
	Koefisien :				
	- Pekerja = $(Tk \times P) : Q2$		0.4217	jam	
	- Mandor = $(Tk \times M) : Q2$		0.0422	jam	
	<b>Produksi : Concrete Pump Trailer</b>	Q4	49.80	m3/jam	
	Produksi / hari				
	Kebutuhan tenaga :				
	- Pekerja	P	2.00	orang	
	- Tukang	T	1.00	orang	
	- Mandor	M	0.20	orang	
	Koefisien :				
	- Pekerja = $(Tk \times P) : Q4$		0.2811	jam	
	- Tukang = $(Tk \times T) : Q4$		0.1406	jam	
	- Mandor = $(Tk \times M) : Q4$		0.02811	jam	

**LAMPIRAN**  
**REKAPITULASIANALISIS HARGA SATUAN PEKERJAAN**  
**( A H S P )**

No. Analisis	Uraian Pekerjaan	Satuan	Harga Satuan (Rp)
<b>G</b>	<b>MAINTENANCE WORK &amp; FINISHING</b>		
G.01	Rip-Rap Boulder, Less Dense-Many Cavities, Height Difference 0-1 m & Mechanical Tidying	m3	333,600
G.02	Aanstamping for building construction	m3	515,790
G.03	1 m2 Plesteran t = 2,00 cm, dengan Mortar Tipe S (12,50 Mpa)	m2	58,020
G.04	Painting 2 m2 of new wall (1 layer of plaster, 1 layer of base coat, 2	m2	43,070

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : G.01  
 Macam pekerjaan : Rip-Rap Boulder, Less Dense-Many Cavities, Height Difference 0-1 m & Mechanical Tidying  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 333,600

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0.0325	13,037	424
2.	Tukang batu	L. 03	orang/jam	0.0163	13,037	212
3.	Mandor	L. 13	orang/jam	0.0033	14,286	46
<b>Jumlah Harga Tenaga Kerja</b>						<b>683</b>
<b>B</b>	<b>Bahan</b>					
1.	Batu Kali	M. 8	m3	1.200	240,000	288,000
<b>Jumlah Harga Bahan</b>						<b>288,000</b>
<b>C</b>	<b>Peralatan</b>					
1.	Excavator, 150-135 HP	E. 09	jam	0.016	897,200	14,593
<b>Jumlah Harga Peralatan</b>						<b>14,593</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>303,276</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>30,328</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m3 (D + E)</b>					<b>333,600</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : G.02  
 Macam pekerjaan : Aanstamping for building construction  
 Kuantitas pekerjaan : 1 m<sup>3</sup>  
 Satuan pengukuran : m<sup>3</sup>  
 Harga Satuan : Rp 515,790

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.7800	91,259	71,182
2.	Tukang batu	L. 03	orang/hari	0.3900	91,259	35,591
3.	Kepala Tukang	L. 8	orang/hari	0.0390	95,000	3,705
4.	Mandor	L. 13	orang/hari	0.0130	100,000	1,300
<b>Jumlah Harga Tenaga Kerja</b>						<b>111,778</b>
<b>B</b>	<b>Bahan</b>					
1.	Batu Belah	M. 7	m3	1.200	240,000	288,000
2.	Pasir Urug	M. 49	m3	0.432	160,000	69,120
<b>Jumlah Harga Bahan</b>						<b>357,120</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>468,898</b>
<b>E</b>	<b>Overhead &amp; Profit (10%<math>\times</math> D)</b>					<b>46,890</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m3 (D + E)</b>					<b>515,790</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : G.03  
 Macam pekerjaan : 1 m<sup>2</sup> Plesteran t = 2,00 cm, dengan Mortar Tipe S (12,50 Mpa)  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 58,020

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.1600	91,259	14,601
2.	Tukang batu	L. 03	orang/hari	0.1600	91,259	14,601
3.	Kepala tukang	L. 8	orang/hari	0.0160	-	-
4.	Mandor	L. 13	orang/hari	0.0160	100,000	1,600
<b>Jumlah Harga Tenaga Kerja</b>						<b>30,803</b>
<b>B</b>	<b>Bahan</b>					
1.	Semen Portland	M. 73	kg	10.3680	1,523	15,785
2.	Pasir Pasang	M. 48	m <sup>3</sup>	0.0308	200,000	6,160
<b>Jumlah Harga Bahan</b>						<b>21,945</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>52,748</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>5,275</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m<sup>2</sup> (D + E)</b>					<b>58,020</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : G.04  
 Macam pekerjaan : Painting 2 m2 of new wall (1 layer of plaster, 1 layer of base co  
 Kuantitas pekerjaan : 1 m<sup>2</sup>  
 Satuan pengukuran : m<sup>2</sup>  
 Harga Satuan : Rp 43,070

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.0667	91,259	6,087
2.	Tukang Cat	L. 06	orang/hari	0.0667	91,259	6,087
3.	Kepala Tukang Cat	L. 11	orang/hari	0.0067	-	-
4.	Mandor	L. 13	orang/hari	0.0022	100,000	220
<b>Jumlah Harga Tenaga Kerja</b>						<b>12,394</b>
<b>B</b>	<b>Bahan</b>					
1.	Cat Tembok Dasar	M. 16	kg	0.1000	27,000	2,700
2.	Cat Tembok Penutup	M. 17	kg	0.2600	86,000	22,360
<b>Jumlah Harga Bahan</b>						<b>25,060</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>37,454</b>
<b>E</b>	<b>Overhead &amp; Profit (15%<math>\times</math> D)</b>					<b>5,618</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m2 (D + E)</b>					<b>43,070</b>

**ANALISA PRODUKSIALAT**

Jenis Pekerjaan

: Finishing /Perapihan

No.	Uraian	Kode	Koefisien	Satuan	Keterangan
<b>I</b>	<b>ASUMSI</b>				
1.	Waktu jam kerja efektif	Tk	7.00	jam	
2.	Faktor konversi volume	Fk	1.70		Batuan Keras
<b>II</b>	<b>URUTAN KERJA</b>				
1.	Pembentukan profil dan perapihan (paprasan) oleh Excavator				
2.	Sisa pemotongan dibuang bebas				
3.	Penataan dan Perapihan batuan boulder oleh Exca				
<b>III</b>	<b>PERHITUNGAN</b>				
<b>1.</b>	<b>BAHAN :</b>				
	Tidak ada bahan yang diperlukan				
<b>2.</b>	<b>ALAT :</b>				
	<b>Excavator, 150-135 HP</b>				
	Kapasitas Bucket	V	0.80	m3	
	Faktor Bucket	Fb	1.00	-	kondisi sedang
	Faktor efisien alat	Fa	0.83	-	kondisi baik
	Faktor konversi galian	Fv	0.90	-	Normal
	Faktor konversi bahan (asli-lepas)	Fk	1.00	-	Pasir asli
	Waktu siklus	Ts			
	- Waktu memotong sesuai profil melintang	T1	0.55		
	- Waktu mengangkat kembali	T2	0.17	menit	Ringan,180°,DT
		Ts	0.72	menit	
	Kapasitas Produksi / jam = $(V \times Fb \times Fa \times 60) / (Ts \times Fk \times Fv)$	Q1	61.48	m3	
	Koefisien alat / m3 = $(1 : Q1)$		0.0163	jam	
<b>3.</b>	<b>TENAGA :</b>				
	<b>Produksi menentukan : Excavator</b>	Q1	61.48	m3/jam	
	Produksi / hari = $Tk \times Q1$	Qt	430.37	m3/jam	
	Kebutuhan tenaga :				
	- Mandor	M	0.20		
	- Pekerja	P	2.00		
	- Tukang	T	1.00		
	Koefisien :				
	- Mandor = $(Tk \times M) : Qt$		0.0033	jam	
	- Pekerja = $(Tk \times P) : Qt$		0.0325	jam	
	- Tukang = $(Tk \times T) : Qt$		0.0163	jam	

**LAMPIRAN**  
**REKAPITULASIANALISIS HARGA SATUAN PEKERJAAN**  
**( A H S P )**

<b>No. Analisis</b>	<b>Uraian Pekerjaan</b>	<b>Satuan</b>	<b>Harga Satuan (Rp)</b>
<b>H</b>	<b>OTHER WORKS</b>		
H.01	Weep Hole	m	44,360
H.02	Dowel Bar	buah	58,250
H.03	Box Culvert 100 x 100 x 120 cm	Buah	4,398,840
H.04	U-Ditch 50 x 60 x 120 cm	Buah	1,044,960
H.05	Guidepost	Buah	144,760
H.06	Achor Bolt	Kg	23,030

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : H.01  
 Macam pekerjaan : Weep Hole  
 Kuantitas pekerjaan : 1 m  
 Satuan pengukuran : m  
 Harga Satuan : Rp 44,360

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.0100	91,259	913
2.	Mandor	L. 13	orang/hari	0.0010	100,000	100
<b>Jumlah Harga Tenaga Kerja</b>						<b>1,013</b>
<b>B</b>	<b>Bahan</b>					
1.	Pipa PVC dia. 2"	M. 59	m'	1.0500	22,285	23,399
2.	Ijuk	M. 25	kg	0.6774	13,390	9,070
3.	Kerikil Beton	M. 35	m3	0.0236	290,000	6,844
<b>Jumlah Harga Bahan</b>						<b>39,314</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>40,326</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>4,033</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - m (D + E)</b>					<b>44,360</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : H.02  
 Macam pekerjaan : Dowel Bar  
 Kuantitas pekerjaan : 1 buah  
 Satuan pengukuran : buah  
 Harga Satuan : Rp 58,250

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	1.3554	13,037	17,671
2.	Mandor	L. 13	orang/jam	0.0904	14,286	1,291
<b>Jumlah Harga Tenaga Kerja</b>						<b>18,961</b>
<b>B</b>	<b>Bahan</b>					
1.	Besi Dowel	M. 13	Kg	2.8443	11,950	33,990
2.	Semen Grouting (Epoxy)	M. 72	liter	0.7300	-	-
<b>Jumlah Harga Bahan</b>						<b>33,990</b>
<b>C</b>	<b>Peralatan</b>					
1.	Drilling Machine 3,32 HP, (Dia. 20-50 mm)	E. 07	jam	0.0904	-	-
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>52,951</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>5,295</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - buah (D + E)</b>					<b>58,250</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : H.03  
 Macam pekerjaan : Box Culvert 100 x 100 x 120 cm  
 Kuantitas pekerjaan : 1 Buah  
 Satuan pengukuran : Buah  
 Harga Satuan : Rp 4,398,840

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0.3500	13,037	4,563
2.	Tukang	L. 02	orang/jam	0.1750	13,037	2,281
3.	Mandor	L. 13	orang/jam	0.0350	14,286	500
<b>Jumlah Harga Tenaga Kerja</b>						<b>7,344</b>
<b>B</b>	<b>Bahan</b>					
1.	Box Culvert 100.100.120	M. 14	Buah	1.0000	3,584,892	3,584,892
2.	Concrete Making and Casting fc' = 10 Mp	F.05	m3	0.2650	986,860	261,518
3.	Pasir Urug	M. 49	m3	0.0920	160,000	14,720
<b>Jumlah Harga Bahan</b>						<b>3,861,129</b>
<b>C</b>	<b>Peralatan</b>					
1.	Crane Truck Hydraulic	E. 06	jam	0.2108	618,800	130,470
<b>Jumlah Harga Peralatan</b>						<b>130,470</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>3,998,944</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>399,894</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - Buah (D + E)</b>					<b>4,398,840</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : H.04  
 Macam pekerjaan : U-Ditch 50 x 60 x 120 cm  
 Kuantitas pekerjaan : 1 Buah  
 Satuan pengukuran : Buah  
 Harga Satuan : Rp 1,044,960

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0.1400	13,037	1,825
2.	Tukang	L. 02	orang/jam	0.0700	13,037	913
3.	Mandor	L. 13	orang/jam	0.0140	14,286	200
<b>Jumlah Harga Tenaga Kerja</b>						<b>2,938</b>
<b>B</b>	<b>Bahan</b>					
1.	U-Ditch 50 x 60 x 120, t = 6,00 cm	M. 87	Buah	1.0000	856,509	856,509
2.	Concrete Making and Casting fc' = 10 Mp	F.05	m3	0.0400	986,860	39,474
3.	Pasir Urug	M. 49	m3	0.0200	160,000	3,200
<b>Jumlah Harga Bahan</b>						<b>899,184</b>
<b>C</b>	<b>Peralatan</b>					
1.	Crane Truck Hydraulic	E. 06	jam	0.0773	618,800	47,839
<b>Jumlah Harga Peralatan</b>						<b>47,839</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>949,960</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>94,996</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - Buah (D + E)</b>					<b>1,044,960</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : H.05  
 Macam pekerjaan : Guidepost  
 Kuantitas pekerjaan : 1 Buah  
 Satuan pengukuran : Buah  
 Harga Satuan : Rp 144,760

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/jam	0.1750	13,037	2,281
2.	Tukang	L. 02	orang/jam	-	13,037	-
3.	Mandor	L. 13	orang/jam	0.0175	14,286	250
<b>Jumlah Harga Tenaga Kerja</b>						<b>2,531</b>
<b>B</b>	<b>Bahan</b>					
1.	Concrete Making and Casting fc' = 20 Mp	F.02	m3	0.0236	1,123,910	26,552
2.	Besi Beton Polos	M. 11	kg	4.2820	11,950	51,170
3.	Cat Tembok Penutup	M. 17	kg	0.1800	86,000	15,480
<b>Jumlah Harga Bahan</b>						<b>93,202</b>
<b>C</b>	<b>Peralatan</b>					
1.	Dump Truck, 7 ton	E. 08	jam	0.0901	398,300	35,867
<b>Jumlah Harga Peralatan</b>						<b>35,867</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>131,601</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>13,160</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - Buah (D + E)</b>					<b>144,760</b>

**LAMPIRAN**  
**ANALISIS HARGA SATUAN PEKERJAAN**  
**(AHSP)**

No. : H.06  
 Macam pekerjaan : Achor Bolt  
 Kuantitas pekerjaan : kg  
 Satuan pengukuran : Kg  
 Harga Satuan : Rp 23,030

No.	Uraian	Kode	Satuan	Koefisien	Harga Satuan (Rp)	Jumlah (Rp)
<b>A</b>	<b>Tenaga Kerja</b>					
1.	Pekerja	L. 01	orang/hari	0.0406	91,259	3,705
2.	Tukang	L. 02	orang/hari	0.0406	91,259	3,705
3.	Kepala Tukang	L. 8	orang/hari	0.0041	95,000	390

4.	Mandor	L. 13	orang/hari	0.0014	100,000	140
<b>Jumlah Harga Tenaga Kerja</b>						<b>7,940</b>
<b>B</b>	<b>Bahan</b>					
1.	1 kg Achor Bolt	H.06	kg	1.0000	13,000	13,000
<b>Jumlah Harga Bahan</b>						<b>13,000</b>
<b>C</b>	<b>Peralatan</b>					
<b>Jumlah Harga Peralatan</b>						<b>-</b>
<b>D</b>	<b>Jumlah (A + B + C)</b>					<b>20,940</b>
<b>E</b>	<b>Overhead &amp; Profit (10% x D)</b>					<b>2,094</b>
<b>F</b>	<b>Harga Satuan Pekerjaan per - Kg (D + E)</b>					<b>23,030</b>

**ANALISA PRODUKSIALAT**

Jenis Pekerjaan : Patok pengarah  
 Satuan Pembayaran : Buah

No.	Uraian	Kode	Koefisien	Satuan	Keterangan
<b>I</b>	<b>ASUMSI</b>				
1	Menggunakan cara manual				
2	Lokasi Pekerjaan : Sepanjang Jalan				
3	Bahan Dasar (patok beton cetak, dll) diangkut dengan truk ke lokasi pekerjaan				
4	Jarak rata-rata Base Camp ke lokasi pekerjaan	L	3.000		
5	Jam kerja efektif per-hari	Tk	7.000		
6	Faktor kehilangan bahan	Fh	1.050		
7	Tulangan praktis	Rc	125.00		
	Kadar Cat		0.280		
<b>II</b>	<b>URUTAN KERJA</b>				
1	Patok ditanam di tepi luar bahy jalan sesuai dengan gambar dan di cat				
<b>III</b>	<b>PERHITUNGAN</b>				
<b>A</b>	<b>BAHAN</b>				
	Beton Fc' 20 Mpa = ( 0,15 x 0,15 x 1,00) x Fh		0.0236	m <sup>3</sup>	
	Baja Tulangan =		4.28	Kg	
	Cat = ( 0,15 x 0,60 x 2,00)		0.18	m <sup>2</sup>	
<b>B</b>	<b>ALAT</b>				
1	<b>Dump Truck, 3.5 ton</b>				
	Kapasitas 1 Kali Angkut	Cp	20.00	Buah	
	Faktor Efisiensi Alat	Fa	0.83		
	Waktu siklus				
	- Waktu memuat = atur, ikat, dll	T1	20.00	menit	
	- Waktu Angkut = ( 2 x L : 25 km/jam) x 60 menit	T2	48.24	menit	
	- Waktu Menurunkan = Rata-rata 1 menit / buah	T3	20.00	menit	
	- Lain-lain = Geser, Atur & tunggu	T4	1.45	menit	
		Ts.1	89.69	menit	
	Kap. Produksi / Jam $\frac{Cp \times Fa}{Ts : 60}$	Q1	11.10	Buah	
	Koefisien Alat / Buah 1 / Q1		0.0901	Jam	
2	Alat Bantu				
	- Pacul, Sekop & Linggis = 4 Buah		1.00	Ls	
	- Kereta Dorong = 1 Buah				
<b>C</b>	<b>TENAGA</b>				
	Produksi Pasang Patok Pengarah / Hari	Q1	11.10	buah/jam	
	Produksi / Hari	Qt	80.00	buah	
	Kebutuhan tenaga :				
	- Pekerja	P	2.00	orang	
	- Mandor	M	1.00	orang	
	Koefisien Tenaga / ton :				
	- Pekerja = (Tk x P) : Qt		0.1750	hari	
	0 = (Tk x T) : Qt		-	hari	
	- Mandor = (Tk x M) : Qt		0.0175	hari	

**ANALISA PRODUKSIALAT**

Jenis Pekerjaan : Pemasangan Box Culvert  
 Satuan Pembayaran : Buah

No.	Uraian	Kode	Koefisien	Satuan	Keterangan
<b>I</b>	<b>ASUMSI</b>				
1	Box culvert, Crane sudah siap di lokasi pekerjaan				
2	Jam Kerja Efektif per-hari	Tk	7.00	jam	
3	Tinggi crane termasuk hoist sudah memenuhi beban yang akan diangkat dan tinggi bebas yang diperlukan saat pelaksanaan				
4	Lokasi crane dapat menjangkau Box Culvert s/d lokasi pemasangan				
5	Posisi crane akan mudah berpindah untuk pelaksanaan pekerjaan				
6	Kehilangan waktu selama pemasangan alat sebelum dan sesudah pelaksanaan pekerjaan dimasukkan dalam masing-masing				
<b>II</b>	<b>URUTAN KERJA</b>				
1	Penempatan Crane dan Box Culvert di Lokasi Pemasangan				
2	Pemasangan kabel slink pada box culvert				
3	Crane mengangkat, swing dan penempatan Box Culvert sesuai rencana				
4	Setting posisi Box Culvert sampai pas posisi				
5	Jika pemasangan belum mencapai panjang design atau sesuai desain lanjutkan ke langkah No. 2 sampai Selesai				
<b>III</b>	<b>PERHITUNGAN</b>				
<b>A</b>	<b>BAHAN</b>				
<b>B</b>	<b>ALAT</b>				
1	<b>Crane Truck Hydraulic, 15 ton</b>				
	Kapasitas per-jam (kontinyu)	V	1.00	buah/jam	
	Faktor efisiensi alat	Fa	0.83		
	Waktu siklus setiap pemasangan				
	- Waktu pemasangan kabel slink pada Box Culvert	T1	7.00	menit	
	- Waktu diangkat, Swing 90 <sup>0</sup> , dan Penempatan	T2	2.50	menit	
	- Waktu swing balik, stand by untuk pemasangan berikutnya sambil lepas kabel slink	T3	1.00	menit	
		Ts.1	10.50	menit	
	Kap. Produksi / Jam	Q1	4.74	buah/jam	
	$\frac{V \times Fa \times 60}{Ts}$				
	Koefisien Alat / Buah		0.2108	buah/jam	
	$1 / Q1$				
<b>C</b>	<b>TENAGA</b>				
	Produksi Crane Truck Hydraulic, 15 ton	Q1	4.74	buah/jam	
	Produksi / Hari	Qt	40.00	buah	
	Kebutuhan tenaga :				
	- Pekerja	P	2.00	orang	
	- Tukang	T	1.00	orang	
	- Mandor	M	1.00	orang	
	Koefisien Tenaga / ton :				
	- Pekerja = (Tk x P) : Qt		0.3500	hari	
	- Tukang = (Tk x T) : Qt		0.1750	hari	
	- Mandor = (Tk x M) : Qt		0.0350	hari	

**ANALISA PRODUKSIALAT**

Jenis Pekerjaan : Pemasangan U-Ditch  
 Satuan Pembayaran : Buah

No.	Uraian	Kode	Koefisien	Satuan	Keterangan
<b>I</b>	<b>ASUMSI</b>				
1	U-Ditch, Crane sudah siap di lokasi pekerjaan				
2	Jam Kerja Efektif per-hari	Tk	7.00	jam	
3	Tinggi Crane termasuk hoist pemegang pile driver sudah memenuhi beban yang akan diangkat dan tinggi bebas yang diperlukan saat pelaksanaan pekerjaan dimasukkan dalam masing-masing				
4	Lokasi crane dapat menjangkau U-Ditch s/d lokasi pemasangan				
5	Posisi crane akan mudah berpindah untuk pelaksanaan pekerjaan				
6	Kehilangan waktu selama pemasangan alat sebelum dan sesudah pelaksanaan pekerjaan dimasukkan dalam masing-masing				
<b>II</b>	<b>URUTAN KERJA</b>				
1	Penempatan Crane dan U-Ditch di Lokasi Pemasangan				
2	Pemasangan kabel slink pada U-ditch				
3	Crane mengangkat, swing dan penempatan U-ditch sesuai rencana				
4	Setting posisi U-Ditch sampai pas posisi				
5	Jika pemasangan belum mencapai panjang design atau sesuai desain lanjutkan ke langkah No. 2 sampai Selesai				
<b>III</b>	<b>PERHITUNGAN</b>				
<b>A</b>	<b>BAHAN</b>				
<b>B</b>	<b>ALAT</b>				
1	<b>Crane Truck Hydraulic, 15 ton</b>				
	Kapasitas per-jam (kontinyu)	V	1.00	buah/jam	
	Faktor efisiensi alat	Fa	0.83		
	Waktu siklus setiap pemasangan				
	- Waktu pemasangan kabel slink pada U-Ditch	T1	2.00	menit	
	- Waktu diangkat, Swing 90 <sup>0</sup> , dan Penempatan	T2	0.85	menit	
	- Waktu swing balik, stand by untuk pemasangan berikutnya sambil lepas kabel slink	T3	1.00	menit	
		Ts.1	3.85	menit	
	Kap. Produksi / Jam	Q1	12.94	buah/jam	
	$\frac{V \times Fa \times 60}{Ts}$				
	Koefisien Alat / Buah		0.0773	buah/jam	
	$1 / Q1$				
<b>C</b>	<b>TENAGA</b>				
	Produksi Crane Truck Hydraulic, 15 ton	Q1	12.94	buah/jam	
	Produksi / Hari	Qt	100.00	buah	
	Kebutuhan tenaga :				
	- Pekerja	P	2.00	orang	
	- Tukang	T	1.00	orang	
	- Mandor	M	1.00	orang	
	Koefisien Tenaga / ton :				
	- Pekerja = (Tk x P) : Qt		0.1400	jam	
	- Tukang = (Tk x T) : Qt		0.0700	jam	
	- Mandor = (Tk x M) : Qt		0.0140	jam	

**ANALISA PRODUKSIALAT**
**Jenis Pekerjaan** : Pemasangan Ruji (Dowel)  
**Satuan Pembayaran** : m'

No.	Uraian	Kode	Koefisien	Satuan	Keterangan
<b>I</b>	<b>ASUMSI</b>				
1	Menggunakan alat berat (cara mekanik)				
2	Lokasi pekerjaan = Sepanjang Jalan				
3	Kondisi existing jalan = Sedang				
4	Jarak rata-rata Base Camp ke lokasi pekerjaan	L	1.000	km	
5	Jam kerja efektif per-hari	Tk	7.000	Jam	
6	Ukuran Lubang Tambalan				
	- Panjang Tambalan	Pjs	2.400	m	
	- Lebar Tambalan	Lbr	3.500	m	
	- Kedalaman Tambalan	Tg	0.300	m	
	- Volume Lubang	V. Lub	2.52	m <sup>3</sup>	
7	Dowel (mm) 32-450		6.32	Kg/m	
	Dia. Lubang Dowel	Dia. Lub	34.00	mm	
8	Berat Isi bahan - Sealant	D2	1.030	ton/m <sup>3</sup>	
9	Faktor Kehilangan Bahan	Fh	1.03	km	
<b>II</b>	<b>URUTAN KERJA</b>				
1	Penyiapan lubang untuk dowel untuk sambungan lama dan baru				
2	Pemasangan 1/2 panjang dowel dilanjutkan dengan grouting				
<b>III</b>	<b>PEMAKAIAN BAHAN, ALAT &amp; TENAGA</b>				
<b>A</b>	<b>BAHAN</b>				
1	Setiap dowel memerlukan =	n	10.80	Buah	
	Berat 1 Dowel = $((1/4 \times 22/7) \times \text{Dia. Dwl}^2) \times (\text{P. Dwl} \times 7856)$	Brt	2.84	Kg	
	Bahan Grout Semen = $(22/7 \times 0,25) \times (\text{Dia. Lub}^2) \times (\text{P. Dwl})/2 \times \text{D2}$ (Bahan Epoxy)	Grout	0.73	liter	
<b>B</b>	<b>ALAT</b>				
1	<b>Drilling Machine 3,32 HP, (Dia. 20-50 mm)</b>				
	Kapasitas pengeboran per jam	V	6.00	m/jam	
	Faktor efisiensi alat	Fa	0.83		
	Kapasitas Produksi / jam = $V \times \text{Fa} / 0,45$	Q1	11.07	Lubang	
	Koefisien alat / m' = $(1 : \text{Q1})$		0.0904	jam	
2	<b>Alat bantu</b>				
	- Pahat Manual				
	- Sekop				
	- Kuas				
	- Alat Suntik Grout (Tabung Flexible dengan Nozzel)				
<b>C</b>	<b>TENAGA</b>				
	Produksi Drilling Machine	Q1	11.07	Lubang	
	Produksi / hari = $\text{Tk} \times \text{Q1}$	Qt	77.47	Lubang/Hari	
	Kebutuhan tenaga :				
	- Pekerja	P	15.00	orang	
	- Mandor	M	1.00	orang	
	Koefisien Tenaga / ton :				
	- Pekerja = $(\text{Tk} \times \text{P}) / \text{Qt}$		1.3554		
	- Mandor = $(\text{Tk} \times \text{M}) / \text{Qt}$		0.0904		

Sifat	Metode Uji	Satuan	Kelas Geotekstil <sup>(a, b)</sup>					
			Kelas 1		Kelas 2		Kelas 3	
			Elongasi < 50% <sup>(c)</sup>	Elongasi ≥ 50% <sup>(c)</sup>	Elongasi < 50% <sup>(c)</sup>	Elongasi ≥ 50% <sup>(c)</sup>	Elongasi < 50% <sup>(c)</sup>	Elongasi ≥ 50% <sup>(c)</sup>
Kuat Grab ( <i>Grab Strength</i> )	ASTM D 4632 RSNI M-01-2005	N	1400	900	1100	700	800	500
Kuat Sambungan Kellman <sup>(d)</sup> ( <i>Sewn Seam Strength</i> )	ASTM D 4632 RSNI M-01-2005	N	1260	810	990	630	720	450
Kuat Sobek ( <i>Tear Strength</i> )	ASTM D 4533 SNI 08-4644-1998	N	500	350	400 <sup>(e)</sup>	250	300	180
Kuat Tusuk ( <i>Puncture Strength</i> )	ASTM D 6241 ISO 12236:2006	N	2750	1925	2200	1375	1650	990

**Catatan:**

<sup>a</sup> Kondisi saat pemasangan umumnya menentukan kelas geotekstil yang dibutuhkan. Kelas 1 dikhususkan untuk kondisi yang parah dimana potensi terjadinya kerusakan geotekstil lebih tinggi, sedangkan Kelas 2 dan Kelas 3 adalah untuk kondisi yang tidak terlalu parah.

<sup>b</sup> Semua nilai syarat kekuatan menunjukkan Nilai Gulungan Rata-rata Minimum dalam arah utama terlemah.

<sup>c</sup> Ditentukan berdasarkan ASTM D 4632 atau RSNI M-01-2005.

<sup>d</sup> Jika dibutuhkan sambungan keliman (*sewn seam*).

<sup>e</sup> Nilai Gulungan Rata-rata Minimum kuat sobek yang dibutuhkan untuk geotekstil filamen tunggal teranyam (*woven monofilamen geotextile*) adalah 250 N.

Table 2, Persyaratan Kekuatan Geotekstil (AASHTO M 288-06)

**Keterangan :**

- elongasi < 50% digunakan untuk **woven geotextile**.
- elongasi ≥ 50% digunakan untuk **non woven geotextile**.

[Apa itu Geotekstil Kelas 1, Geotextile Kelas 2, dan Geotextile Kelas 3 ? \(pandu-equator.com\)](http://pandu-equator.com)

	Alat dengan Tekanan Permukaan Rendah ( <i>Low Ground Pressure</i> ) ≤ 25 kPa (3.6 psi)	Alat dengan Tekanan Permukaan Sedang ( <i>Medium Ground Pressure</i> ) 25 kPa – 50 kPa (3.6 psi – 7.3 psi)	Alat dengan Tekanan Permukaan Tinggi ( <i>High Ground Pressure</i> ) > 50 kPa (> 7.3 psi)
Tanah dasar telah dibersihkan dari halangan kecuali rumput, kayu, daun dan sisa ranting kayu. Permukaan halus dan rata sehingga lubang/gundukan tidak lebih dalam/tinggi dari 450 mm. Lubang yang lebih besar dari ukuran tersebut harus ditutup. Alternatif lain, lantai kerja dapat digunakan.	Rendah (Kelas 3)	Sedang (Kelas 2)	Tinggi (Kelas 1)
Tanah dasar telah dibersihkan dari halangan yang lebih besar dari cabang kayu dan batu yang berukuran kecil sampai sedang. Batang dan pangkal/akar pohon harus dipindahkan atau ditutup sebagian dengan lantai kerja. Lubang/gundukan tidak boleh lebih dalam/tinggi dari 450 mm. Lubang yang lebih besar dari ukuran tersebut harus ditutup.	Sedang (Kelas 2)	Tinggi (Kelas 1)	Sangat Tinggi (Kelas 1+)
Diperlukan persiapan lokasi secara minimal. Pohon dapat ditumbangkan, dipotong-potong dan ditinggalkan di tempat. Pangkal/akar pohon harus dipotong dan tidak boleh lebih dari 150 mm diatas tanah dasar. Geotekstil dapat dipasang langsung diatas cabang pohon, pangkal/akar pohon, lubang besar dan tonjolan, saluran dan bolder. Ranting, pangkal/akar, lubang besar dan tonjolan, alur air dan bongkah batu. Benda-benda harus dipindahkan hanya jika penempatan geotekstil dan bahan penutup akan berpengaruh terhadap permukaan akhir jalan.	Tinggi (Kelas 1)	Sangat Tinggi (Kelas 1+)	Tidak Direkomendasikan

**Catatan:**

Syarat derajat daya bertahan (*survivability*) merupakan fungsi dari kondisi tanah dasar, peralatan konstruksi dan tebal penghamparan. Sifat-sifat geotekstil Kelas 1, 2 and 3 ditunjukkan pada Kelas 1+ sifat-sifatnya lebih tinggi dari Kelas 1, tetapi belum terdefinisikan sampai saat ini dan **jika digunakan harus disyaratkan oleh Pembeli.**

Rekomendasi tersebut adalah untuk tebal penghamparan awal antara 150 - 300 mm. Untuk tebal penghamparan awal lainnya:

- 300 - 450 mm: kurangi syarat daya bertahan sebesar satu tingkat
- 450 - 600 mm: kurangi syarat daya bertahan sebesar dua tingkat
- 600 mm: kurangi syarat daya bertahan sebesar tiga tingkat

Untuk teknik konstruksi khusus, seperti pembuatan alur awal (*prerutting*), tingkatkan syarat daya bertahan geotekstil sebesar satu tingkat. Penghamparan awal bahan penutup yang terlalu tebal dapat menyebabkan keruntuhan daya dukung tanah dasar yang lunak.

Table 1, Syarat Derajat Daya Bertahan (*Survivability*), AASHTO M 288-06