

**The Republic of Indonesia
Directorate General of Water Resources
Ministry of Public Works**

**The Project for Capacity Development
of Mt. Semeru Volcanic Disaster
Structural Measure Planning
in The Republic of Indonesia**

**Project Completion Report
Annex (7) Final Report
Appendix Volume 2**

Feburuary 2025

Japan International Cooperation Agency (JICA)

Yachiyo Engineering Co., Ltd.

Appendix

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Appendix 6-1-1 Quantity Calculation (S2)



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

**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**

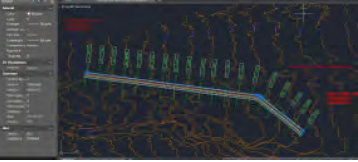
**DRAFT
QUANTITY CALCULATION**

JICA Project Team

August 2024

Curah Lengkong Dike Summary Bill of Quantity

No.	Description	Unit	Volume
A	PREPARATION WORK		
1	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	17.922,39
2	1 m Excavation Cross Profile	m	261,00
3	Bowplank Installation	m	1.800,00
B	DYKE WORK		
1	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanical Transported radius 2000 m	m3	12.599,85
2	Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Split Stone	m3	8.560,45
3	Concrete Making and Casting fc' = 10 Mpa (K 125) Mechanical Transported radius 2000 m	m3	380,00
4	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	19.969,00
5	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	25.783,00
6	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	19.969,00
7	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	5.814,00
8	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	5.814,00
9	Mechanical Sand Excavation (excavated material is dumped nearby)	m3	36.785,08
10	Geotextile, Medium thickness (> 400 to < 800 gr), Manual	m2	15.300,00

Name Structure : : Curah Lengkong Dike						
Type of work : BowPlank						
No.	Description	Calculation	Volume	Unit	Drawing reference	
1	Dike Length = Installed in =	900,00 2,00	<i>m</i> side	1.800,00	m	
			BowPlank Total Volume =	1.800,00	m'	

Name Structure : : Curah Lengkok Dike
 Type of work : Sand Excavation

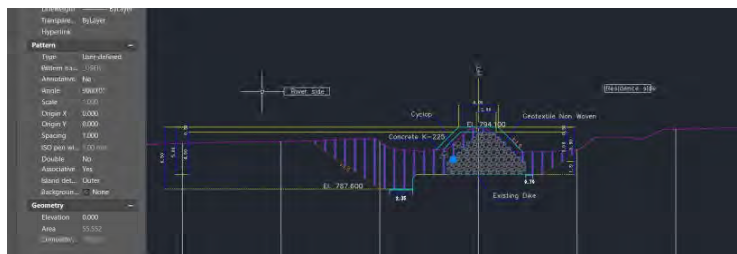
No.	Description	Calculation	Volume	Unit
1	0+000			
	Area	40,99		
	Length	50,000		
		$V = (40,99) / 2 \times 50,00$	1.024,78	m ³



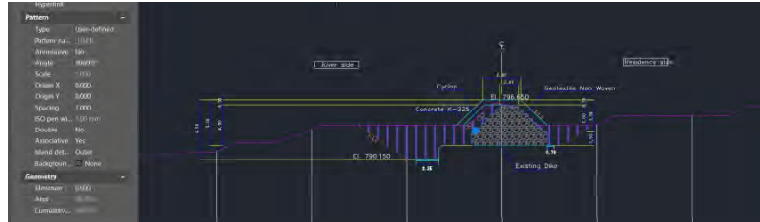
2	0+050			
	Area	43,47		
	Length	50,000		
		$V = (40,99 + 43,47) / 2 \times 50,00$	2.111,40	m ³



3	0+100			
	Area	55,55		
	Length	50,00		
		$V = (43,47 + 55,55) / 2 \times 50,00$	2.475,43	m ³



4	0+150			
	Area	40,24		
	Length	50,00		
		$V = (55,55 + 40,24) / 2 \times 50,00$	2.394,70	m ³



5	0+200			
	Area	32,08		
	Length	50,00		
		$V = (40,24 + 32,08) / 2 \times 50,00$	1.808,00	m ³



6	0+250			
	Area	31,76		
	Length	50,00		
		$V = (32,08 + 31,76) / 2 \times 50,00$	1.596,13	m ³



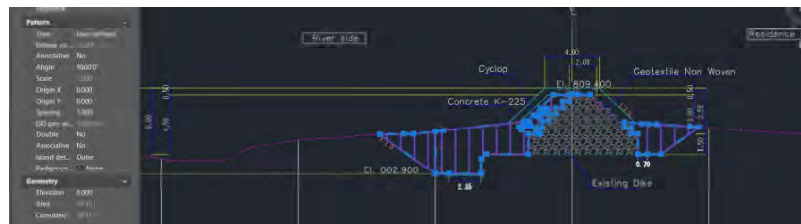
7	0+300				
	Area	35,47			
	Length	50,00			
		$V = (31,76 + 35,47) / 2 \times 50,00$		1.680,80	m ³



8	0+350				
	Area	23,38			
	Length	50,00			
		$V = (35,47 + 23,38) / 2 \times 50,00$		1.471,20	m ³



9	0+400				
	Area	36,15			
	Length	50,00			
		$V = (23,38 + 36,15) / 2 \times 50,00$		1.488,20	m ³



10	0+450				
	Area	27,67			
	Length	50,00			
		$V = (36,15 + 27,67) / 2 \times 50,00$		1.595,43	m ³



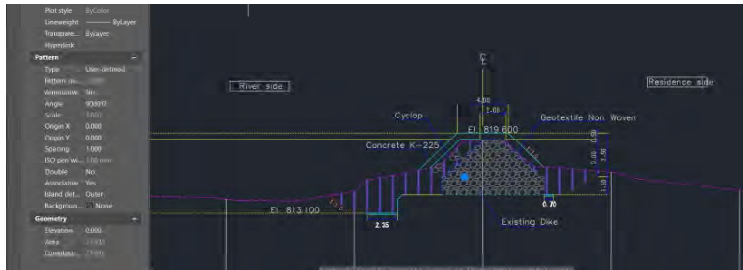
11	0+500				
	Area	28,42			
	Length	50,00			
		$V = (27,67 + 28,42) / 2 \times 50,00$		1.402,15	m ³



12	0+550				
	Area	33,07			
	Length	50,00			
		$V = (28,42 + 33,07) / 2 \times 50,00$		1.537,25	m ³



13	0+600				
	Area		27,94		
	Length		50,00		
		V=	$(33,07 + 27,94) / 2 \times 50,00$	1.525,13	m ³



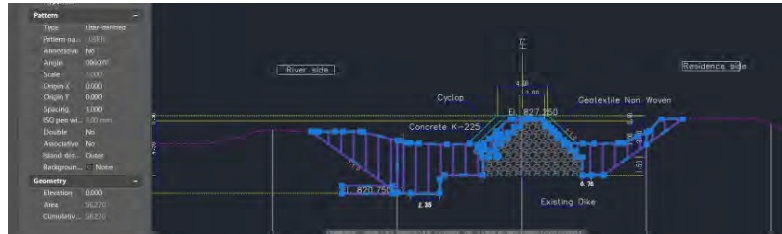
14	0+650				
	Area		39,30		
	Length		50,00		
		V=	$(27,94 + 39,30) / 2 \times 50,00$	1.680,80	m ³



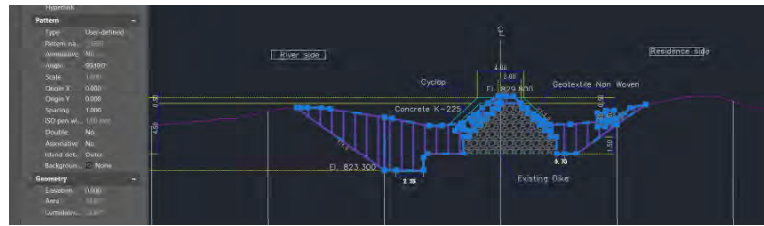
15	0+700				
	Area		41,87		
	Length		50,00		
		V=	$(39,30 + 41,87) / 2 \times 50,00$	2.029,08	m ³



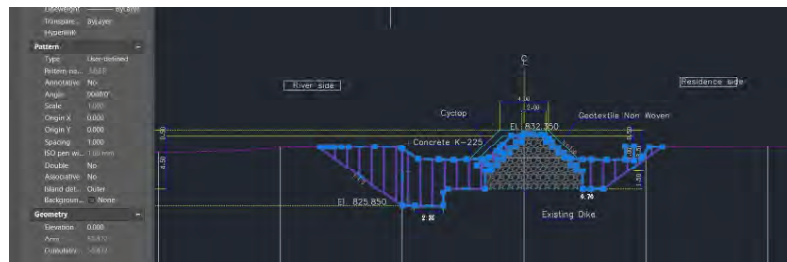
16	0+750			
	Area	56,27		
	Length	50,00		
		$V = (41,87 + 56,27) / 2 \times 50,00$	2.453,40	m ³



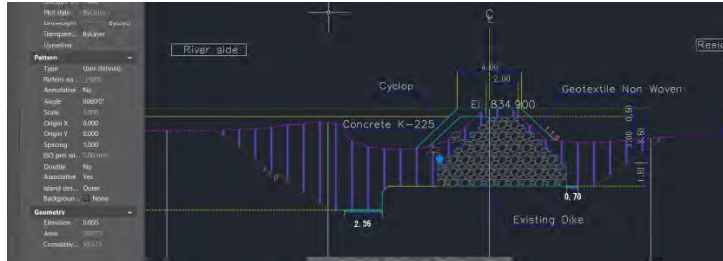
17	0+800			
	Area	58,87		
	Length	50,00		
		$V = (56,27 + 58,87) / 2 \times 50,00$	2.878,53	m ³



18	0+850			
	Area	53,43		
	Length	50,00		
		$V = (58,87 + 53,43) / 2 \times 50,00$	2.807,58	m ³



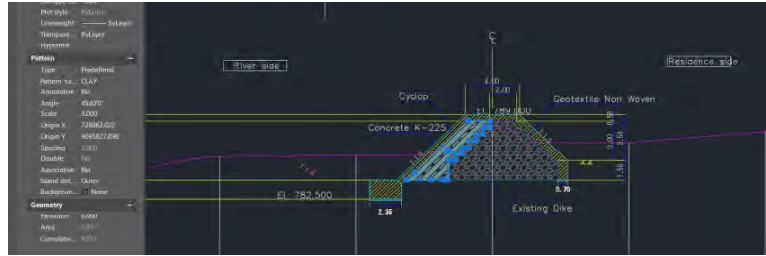
19	0+900			
	Area	59,57		
	Length	50,00		
		$V = (53,43 + 59,57) / 2 \times 50,00$	2.825,13	m ³



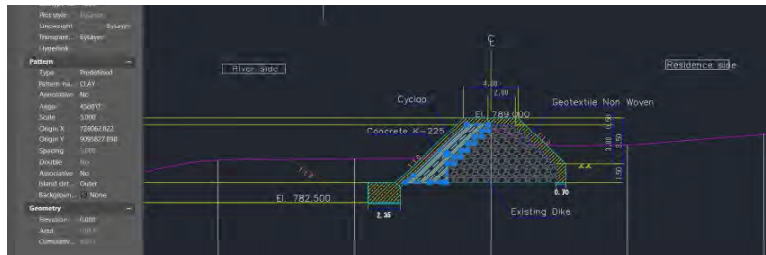
		Sand Excavation Total Volume =	36.785,08	m³
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Name Structure : : Curah Lengong Dike
 Type of work : Cyclops Concrete

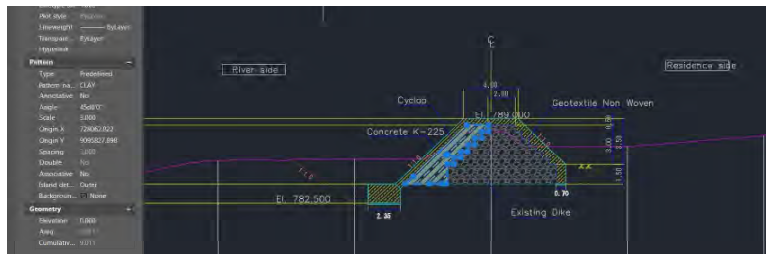
No.	Description	Calculation	Volume	Unit
1	0+000			
	Area	9,01		
	Length	50,000		
		$V= 9,01 \times 50,00$	450,55	m ³



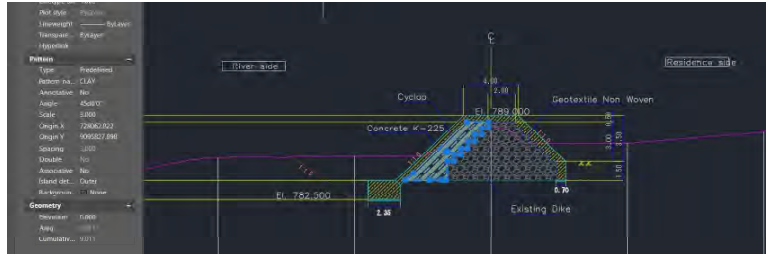
2	0+050			
	Area	9,01		
	Length	50,000		
		$V= 9,01 \times 50,00$	450,55	m ³



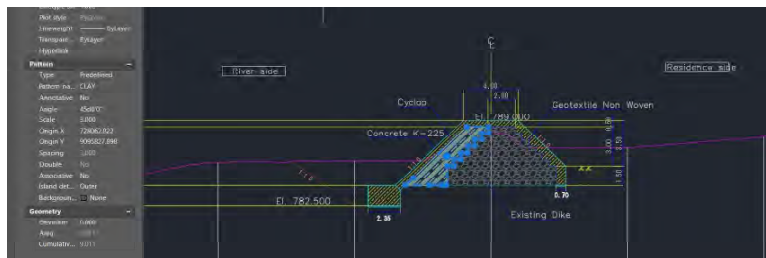
3	0+100			
	Area	9,01		
	Length	50,00		
		$V= 9,01 \times 50,00$	450,55	m ³



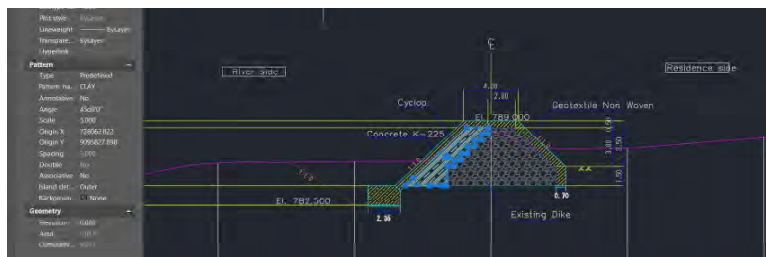
4	0+150				
	Area	9,01			
	Length	50,00			
		$V=9,01 \times 50,00$		450,55	m ³



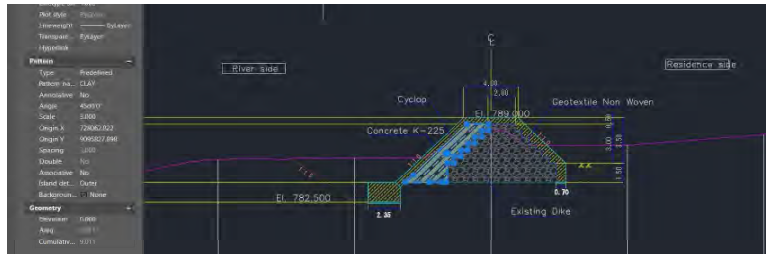
5	0+200				
	Area	9,01			
	Length	50,00			
		$V=9,01 \times 50,00$		450,55	m ³



6	0+250				
	Area	9,01			
	Length	50,00			
		$V=9,01 \times 50,00$		450,55	m ³



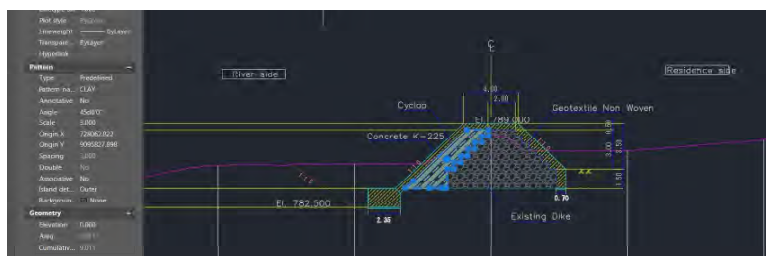
7	0+300				
	Area	9,01			
	Length	50,00			
		V= 9,01 x 50,00		450,55	m³



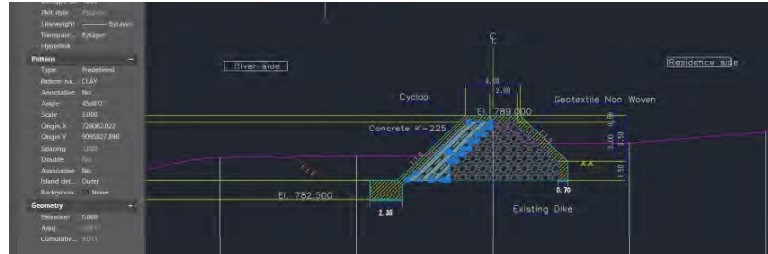
8	0+350				
	Area	9,01			
	Length	50,00			
		V= 9,01 x 50,00		450,55	m³



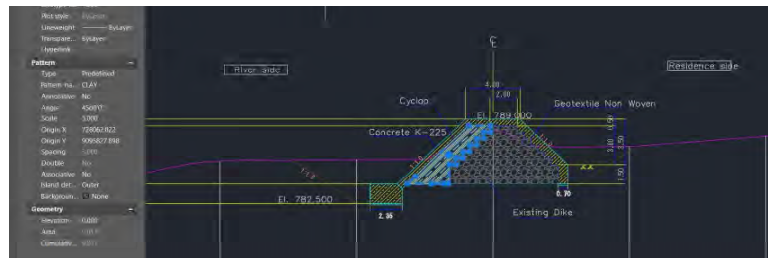
9	0+400				
	Area	9,01			
	Length	50,00			
		V= 9,01 x 50,00		450,55	m³



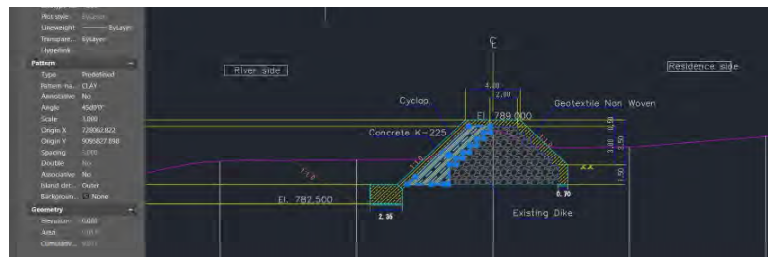
10	0+450				
	Area	9,01			
	Length	50,00			
		$V=9,01 \times 50,00$		450,55	m ³



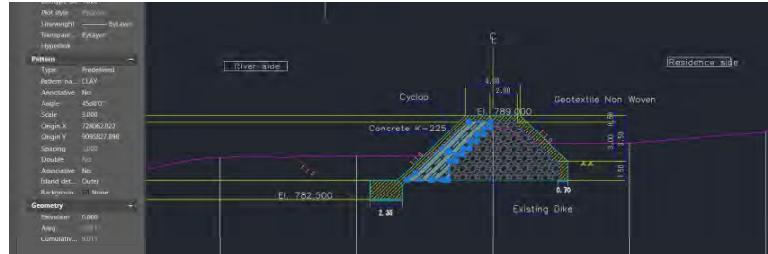
11	0+500				
	Area	9,01			
	Length	50,00			
		$V=9,01 \times 50,00$		450,55	m ³



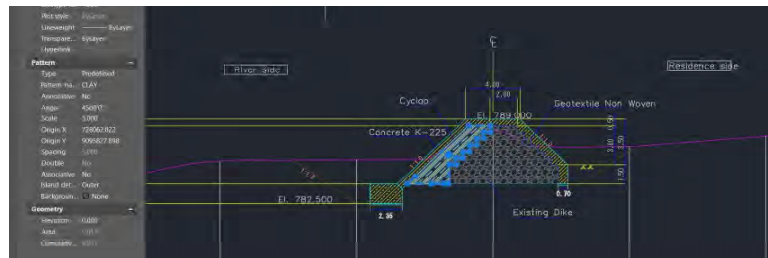
12	0+550				
	Area	9,01			
	Length	50,00			
		$V=9,01 \times 50,00$		450,55	m ³



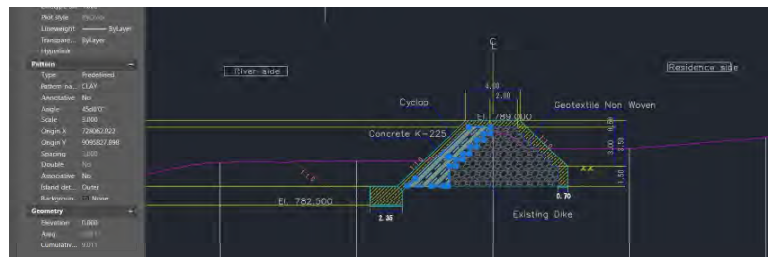
13	0+600				
	Area	9,01			
	Length	50,00			
		V= 9,01 x 50,00		450,55	m³



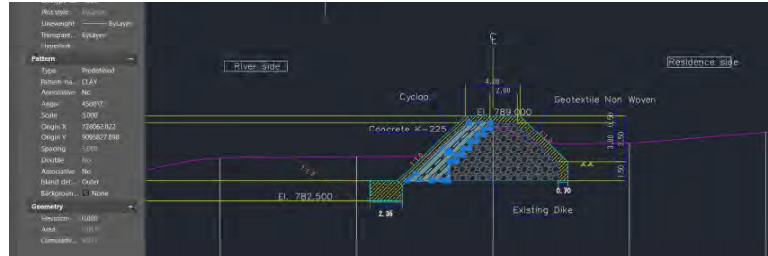
14	0+650				
	Area	9,01			
	Length	50,00			
		V= 9,01 x 50,00		450,55	m³



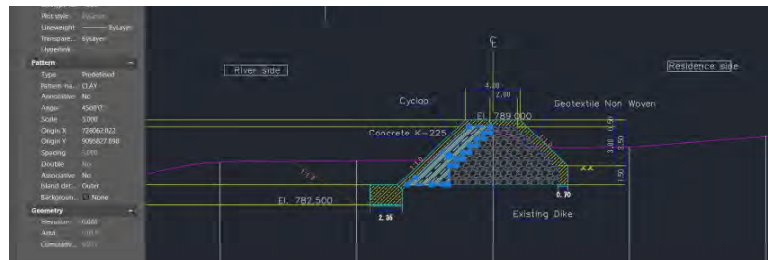
15	0+700				
	Area	9,01			
	Length	50,00			
		V= 9,01 x 50,00		450,55	m³



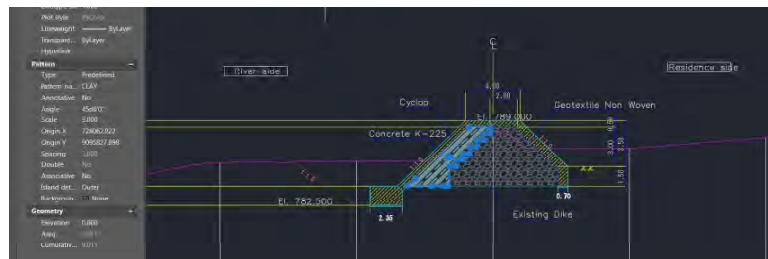
16	0+750				
	Area	9,01			
	Length	50,00			
		V= 9,01 x 50,00		450,55	m³



17	0+800				
	Area	9,01			
	Length	50,00			
		V= 9,01 x 50,00		450,55	m³



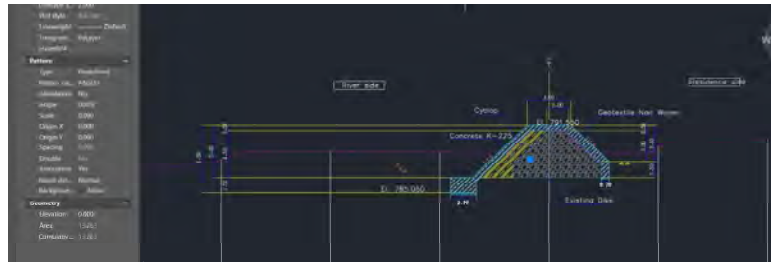
18	0+850				
	Area	9,01			
	Length	50,00			
		V= 9,01 x 50,00		450,55	m³



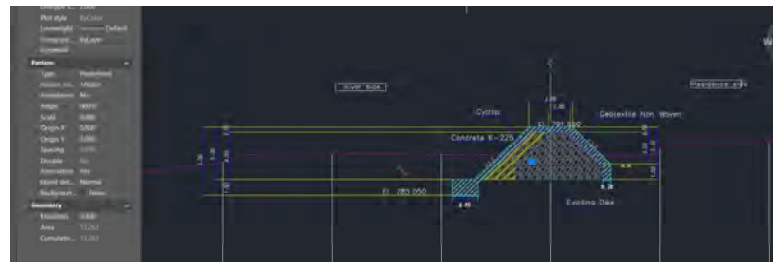
19	0+900			
	Area	9,01		
	Length	50,00		
		V= 9,01 x 50,00		
			450,55	m³
			Cyclops Concrete Total Volume =	8.560,45 m³

Name Structure : Curah Lengkong Dike
 Type of work : Concrete K-225

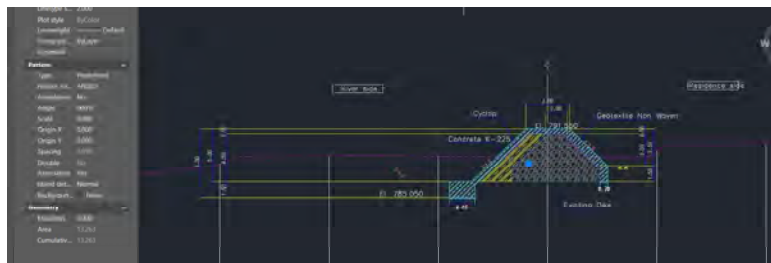
No.	Description	Calculation	Volume	Unit
1	0+000			
	Area	13,26		
	Length	50,000		
		V= 13,26 x 50,00	663,15	m'



2	0+050			
	Area	13,26		
	Length	50,000		
		V= 13,26 x 50,00	663,15	m'

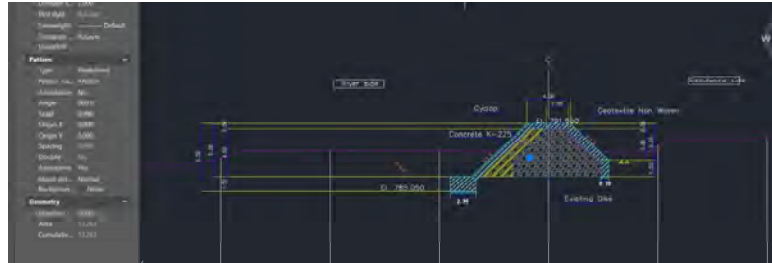


3	0+100			
	Area	13,26		
	Length	50,00		
		V= 13,26 x 50,00	663,15	m'

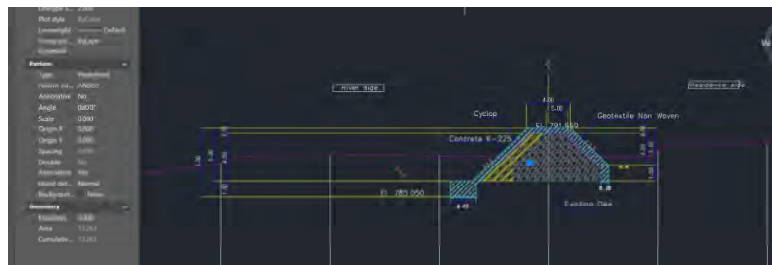


4	0+150				
	Area	13,26			
	Length	50,00			
		V= 13,26 x 50,00		663,15	m³
5	0+200				
	Area	13,26			
	Length	50,00			
		V= 13,26 x 50,00		663,15	m³
6	0+250				
	Area	13,26			
	Length	50,00			
		V= 13,26 x 50,00		663,15	m³

7	0+300				
	Area	13,26			
	Length	50,00			
		V= 13,26 x 50,00		663,15	m³



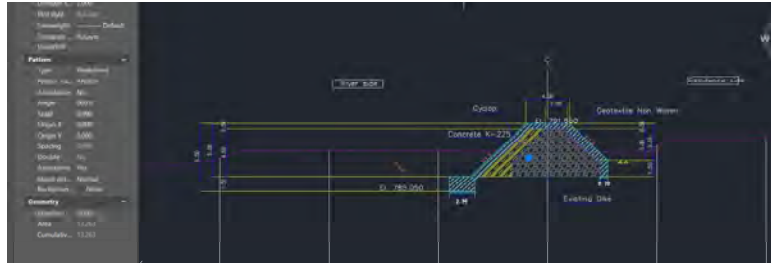
8	0+350				
	Area	13,26			
	Length	50,00			
		V= 13,26 x 50,00		663,15	m³



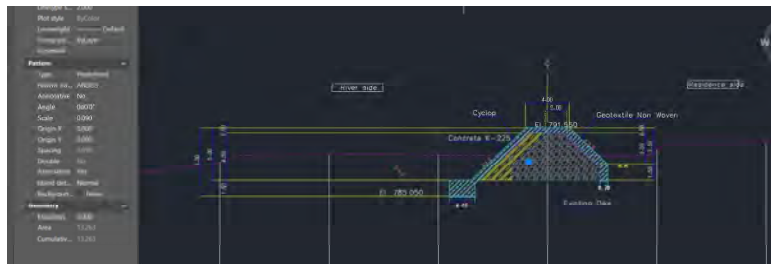
9	0+400				
	Area	13,26			
	Length	50,00			
		V= 13,26 x 50,00		663,15	m³



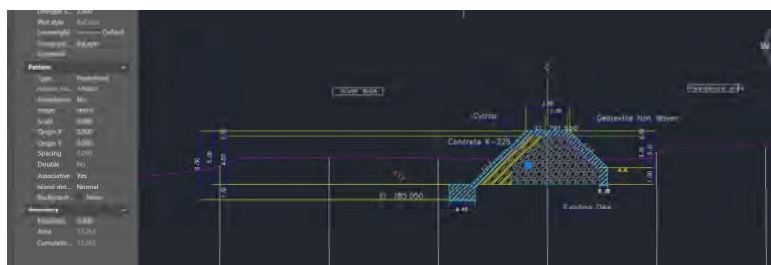
10	0+450				
	Area	13,26			
	Length	50,00			
		V= 13,26 x 50,00		663,15	m³



11	0+500				
	Area	13,26			
	Length	50,00			
		V= 13,26 x 50,00		663,15	m³

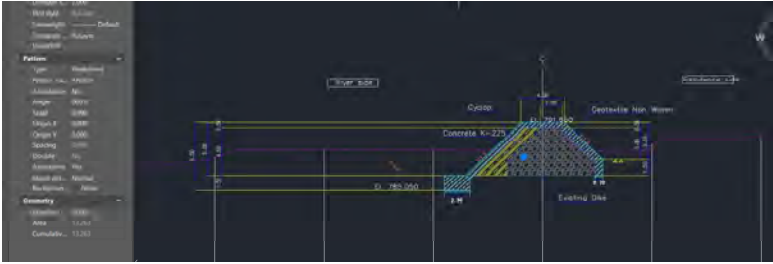


12	0+550				
	Area	13,26			
	Length	50,00			
		V= 13,26 x 50,00		663,15	m³



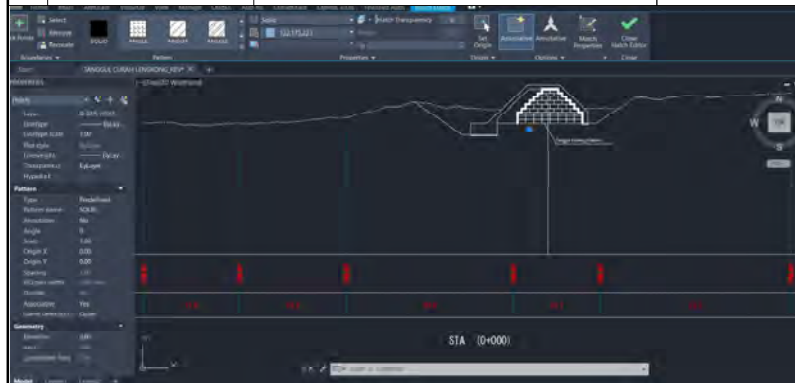
13	0+600				
	Area	13,26			
	Length	50,00			
		V= 13,26 x 50,00		663,15	m³
14	0+650				
	Area	13,26			
	Length	50,00			
		V= 13,26 x 50,00		663,15	m³
15	0+700				
	Area	13,26			
	Length	50,00			
		V= 13,26 x 50,00		663,15	m³

16	0+750				
	Area	13,26			
	Length	50,00			
		V= 13,26 x 50,00		663,15	m³
17	0+800				
	Area	13,26			
	Length	50,00			
		V= 13,26 x 50,00		663,15	m³
18	0+850				
	Area	13,26			
	Length	50,00			
		V= 13,26 x 50,00		663,15	m³

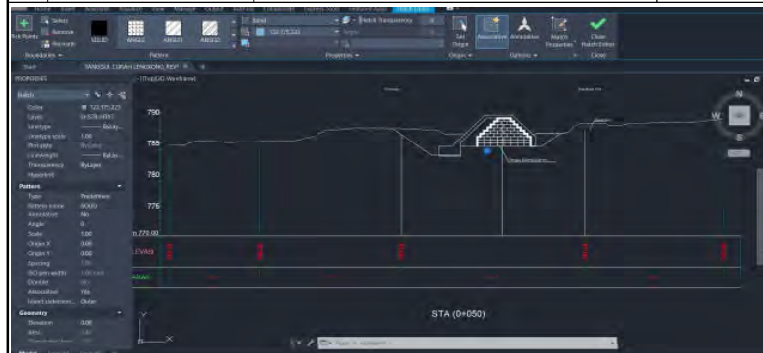
19	0+900			
	Area	13,26		
	Length	50,00		
	V=	13,26 x 50,00	663,15	m ³
				
			Concrete K-225 Total Volume =	12.599,85 m ³

Name Structure : Curah Lengkong Dike
 Type of work : Lean Concrete (K-125)

No.	Description	Calculation	Volume	Unit
1	0+000			
	Area	0,40		
	Length	50,000		
		$V= 0,40 \times 50,000$	20,00	m ³



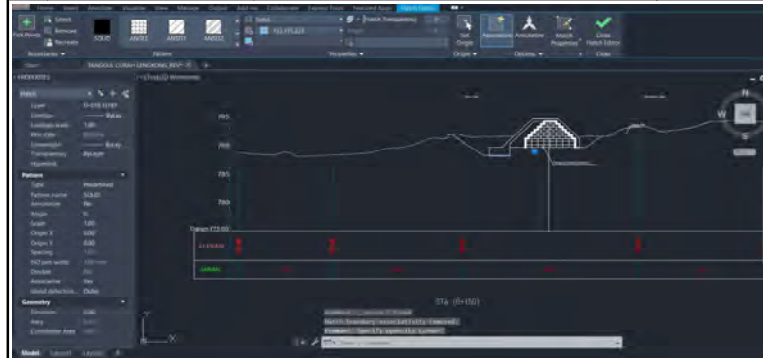
2	0+050			
	Area	0,40		
	Length	50,000		
		$V= 0,40 \times 50,000$	20,00	m ³



3	0+100			
	Area	0,40		
	Length	50,000		
		$V= 0,40 \times 50,000$	20,00	m ³



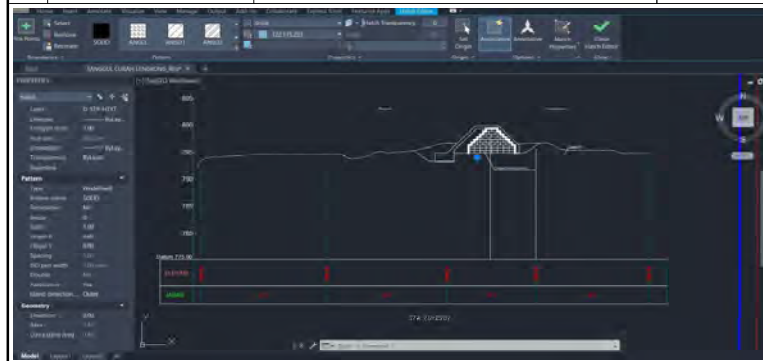
4	0+150				
	Area	0,40			
	Length	50,00			
		V= 0.40 x 50.00		20,00	m³



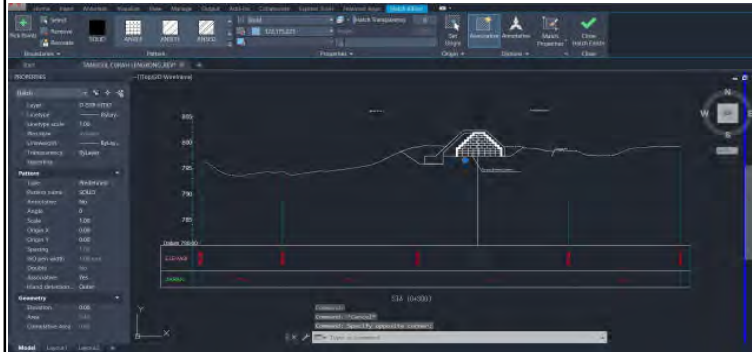
5	0+200				
	Area	0,40			
	Length	50,00			
		V= 0.40 x 50.00		20,00	m³



6	0+250				
	Area	0,40			
	Length	50,00			
		V= 0.40 x 50.00		20,00	m³



7	0+300				
	Area	0,40			
	Length	50,00			
		V= 0.40 x 50.00			
				20,00	m³



8	0+350				
	Area	0,40			
	Length	50,00			
		V= 0.40 x 50.00			
				20,00	m³



9	0+400				
	Area	0,40			
	Length	50,00			
		V= 0.40 x 50.00			
				20,00	m³

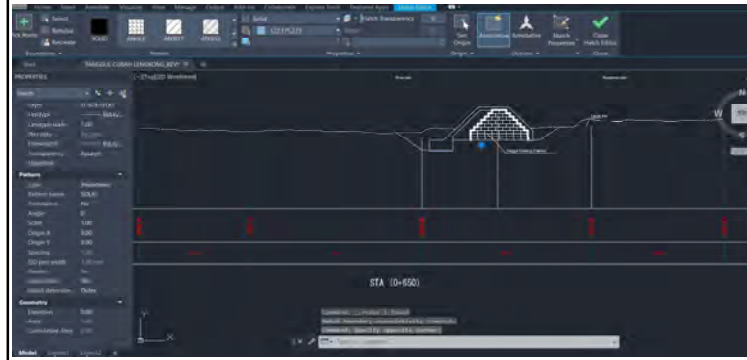


10	0+450	Area Length	0,40 50,00 V= 0.40 x 50.00	20,00	m ³
11	0+500	Area Length	0,40 50,00 V= 0.40 x 50.00	20,00	m ³
12	0+550	Area Length	0,40 50,00 V= 0.40 x 50.00	20,00	m ³

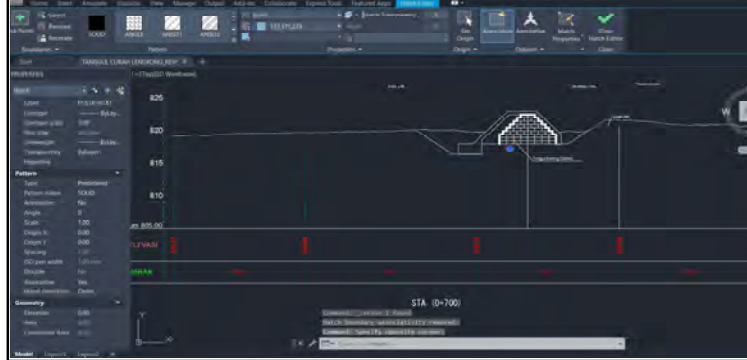
13	0+600				
	Area	0,40			
	Length	50,00			
		V= 0.40 x 50.00		20,00	m³



14	0+650				
	Area	0,40			
	Length	50,00			
		V= 0.40 x 50.00		20,00	m³



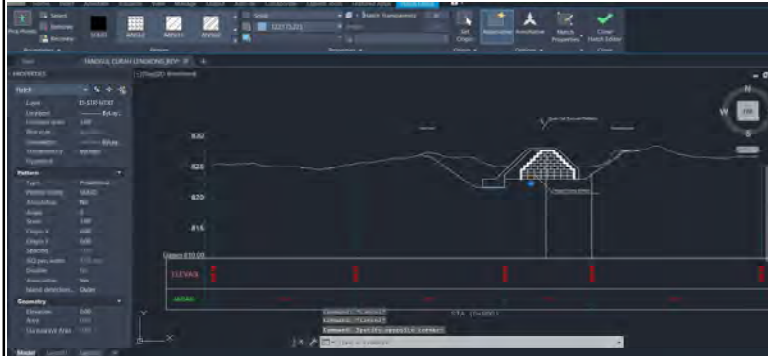
15	0+700				
	Area	0,40			
	Length	50,00			
		V= 0.40 x 50.00		20,00	m³



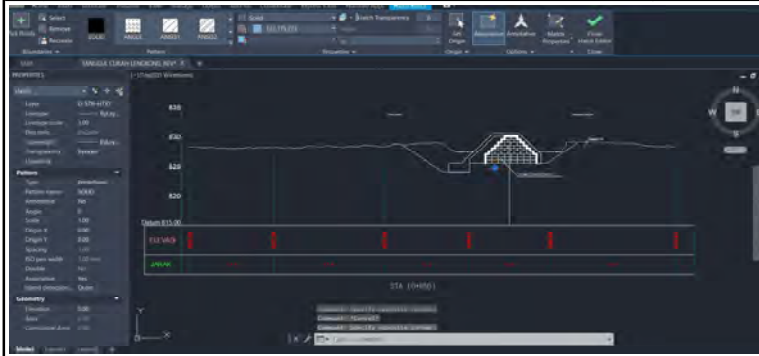
16	0+750				
	Area	0,40			
	Length	50,00			
		V= 0.40 x 50.00			
				20,00	m³

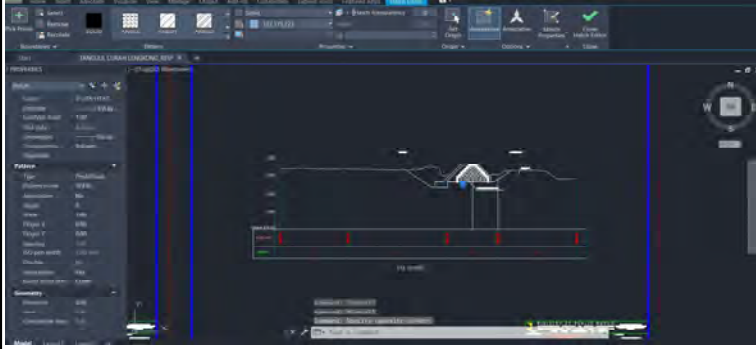


17	0+800				
	Area	0,40			
	Length	50,00			
		V= 0.40 x 50.00			
				20,00	m³



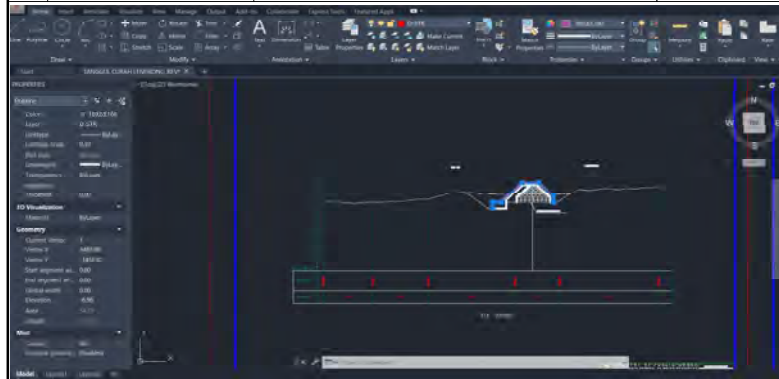
18	0+850				
	Area	0,40			
	Length	50,00			
		V= 0.40 x 50.00			
				20,00	m³



19	0+900			
	Area	0,40		
	Length	50,00		
		$V= 0.40 \times 50.00$		
			20,00	m ³
				
			Lean Concrete Total Volume =	380,00 m ³

Name Structure :	Curah Lengkong Dike
Type of work :	Expose Wall Formwork

No.	Description	Calculation	Volume	Unit
1	0+000			
	Area	21,02		
	Length	50,000		
		V= 21.02 x 50.00	1.051,00	m ³



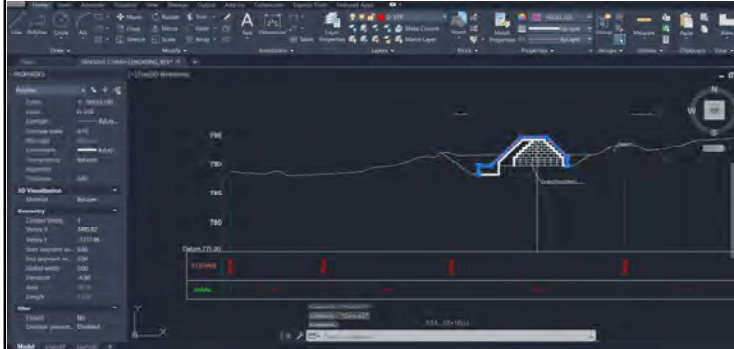
2	0+050			
	Area	21,02		
	Length	50,000		
		V= 21.02 x 50.00	1.051,00	m ³



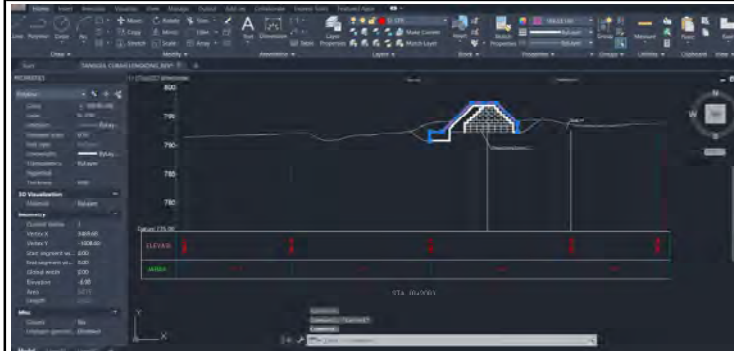
3	0+100			
	Area	21,02		
	Length	50,000		
		V= 21.02 x 50.00	1.051,00	m ³



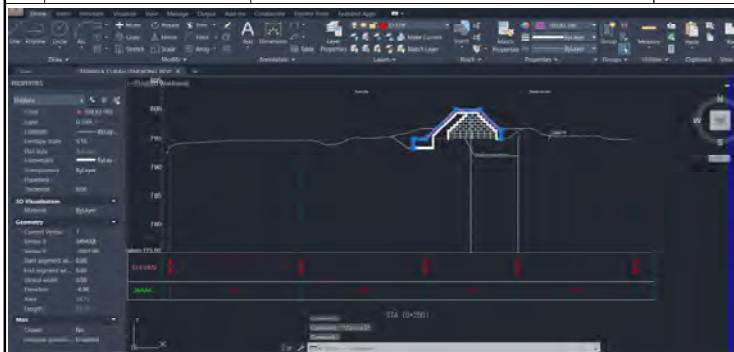
4	0+150				
	Area	21,02			
	Length	50,00			
		V= 21.02 x 50.00		1.051,00	m ²



5	0+200				
	Area	21,02			
	Length	50,00			
		V= 21.02 x 50.00		1.051,00	m ²

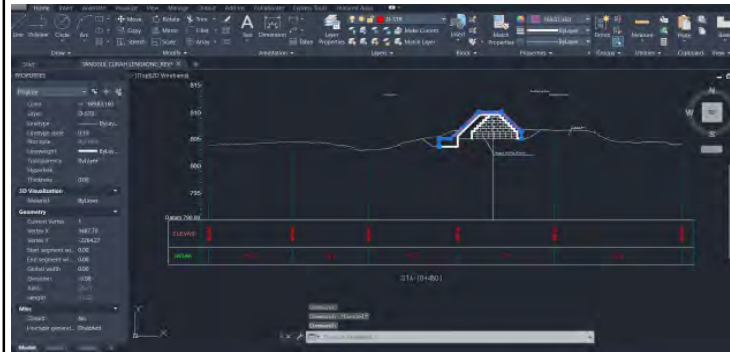


6	0+250				
	Area	21,02			
	Length	50,00			
		V= 21.02 x 50.00		1.051,00	m ²

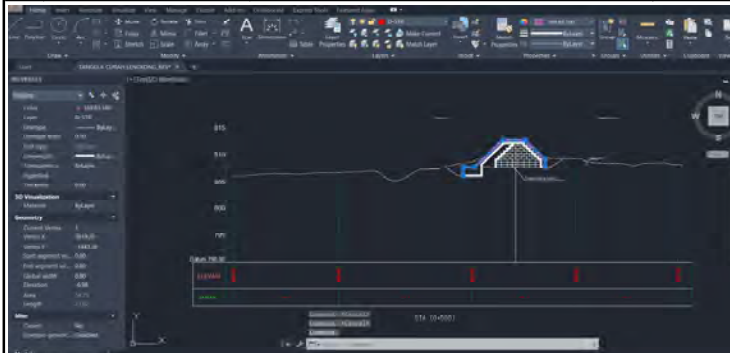


7	0+300	Area Length	21,02 50,00 V= 21.02 x 50.00	1.051,00	m ²
8	0+350	Area Length	21,02 50,00 V= 21.02 x 50.00	1.051,00	m ²
9	0+400	Area Length	21,02 50,00 V= 21.02 x 50.00	1.051,00	m ²

10	0+450				
	Area	21,02			
	Length	50,00			
		V= 21.02 x 50.00		1.051,00	m ²



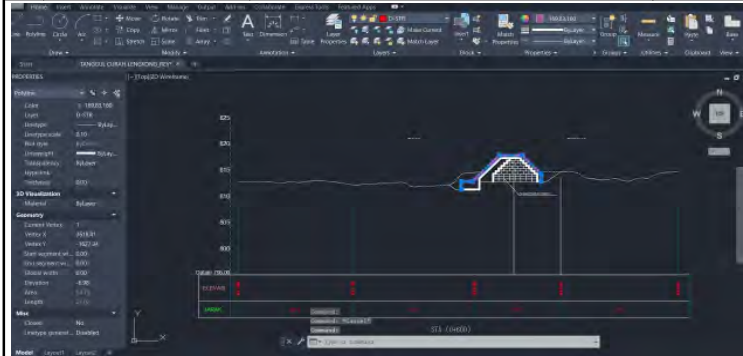
11	0+500				
	Area	21,02			
	Length	50,00			
		V= 21.02 x 50.00		1.051,00	m ²



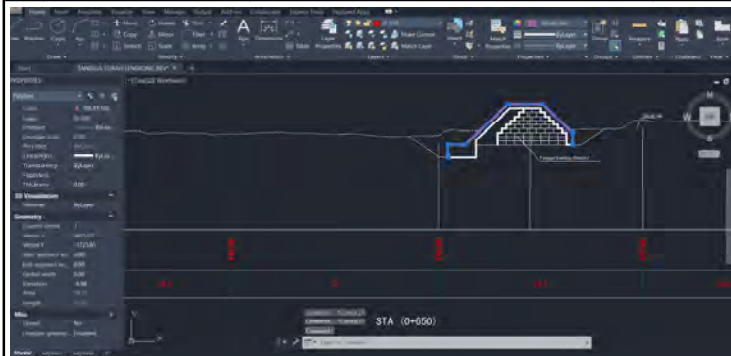
12	0+550				
	Area	21,02			
	Length	50,00			
		V= 21.02 x 50.00		1.051,00	m ²



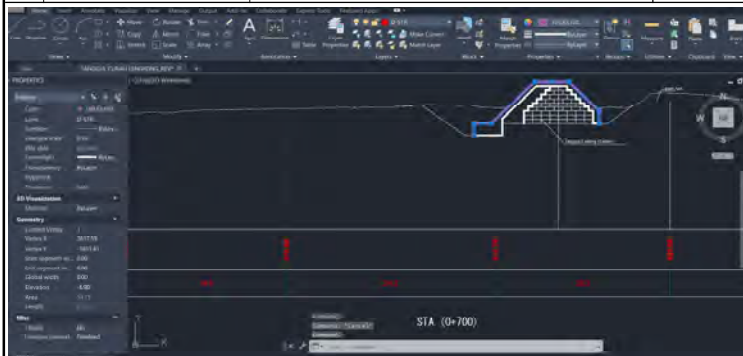
13	0+600				
	Area	21,02			
	Length	50,00			
		V= 21.02 x 50.00			
				1.051,00	m ²



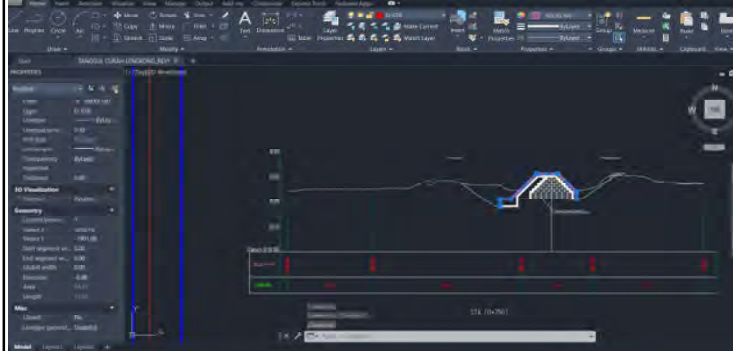
14	0+650				
	Area	21,02			
	Length	50,00			
		V= 21.02 x 50.00			
				1.051,00	m ²



15	0+700				
	Area	21,02			
	Length	50,00			
		V= 21.02 x 50.00			
				1.051,00	m ²



16	0+750				
	Area	21,02			
	Length	50,00			
		V= 21.02 x 50.00		1.051,00	m ²

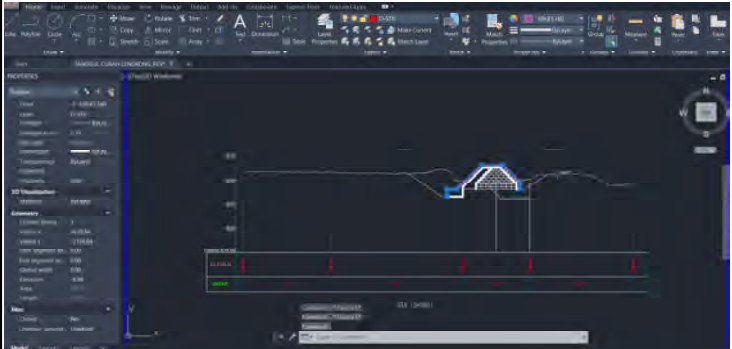


17	0+800				
	Area	21,02			
	Length	50,00			
		V= 21.02 x 50.00		1.051,00	m ²



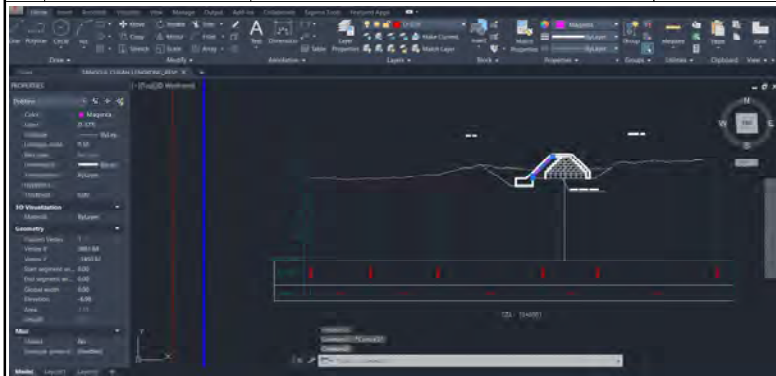
18	0+850				
	Area	21,02			
	Length	50,00			
		V= 21.02 x 50.00		1.051,00	m ²



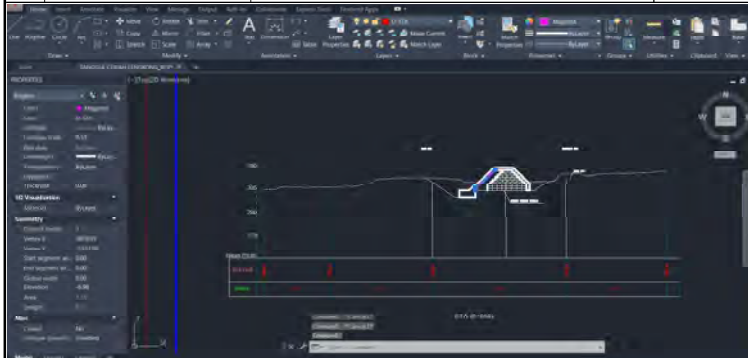
19	0+900			
	Area	21,02		
	Length	50,00		
		V= 21.02 x 50.00	1.051,00	m ³
				
			Expose Wall Formwork Total Volume =	19.969,00 m ³

Name Structure :	Curah Lengkong Dike
Type of work :	Non Exposed Wall Formwork

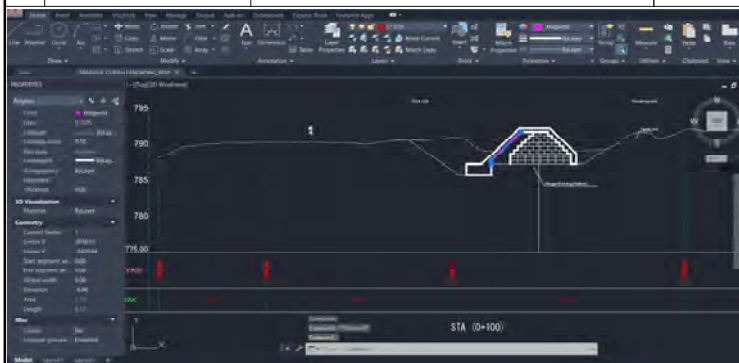
No.	Description	Calculation	Volume	Unit
1	0+000			
	Area	6,12		
	Length	50,000		
		$V = 6.12 \times 50.00$	306,00	m ³



2	0+050			
	Area	6,12		
	Length	50,000		
		$V = 6.12 \times 50.00$	306,00	m ³



3	0+100			
	Area	6,12		
	Length	50,000		
		$V = 6.12 \times 50.00$	306,00	m ³



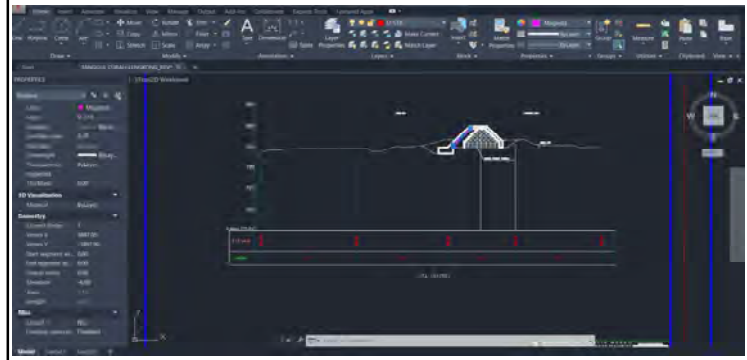
4	0+150				
	Area	6,12			
	Length	50,00			
		V= 6.12 x 50.00			
				306,00	m ²



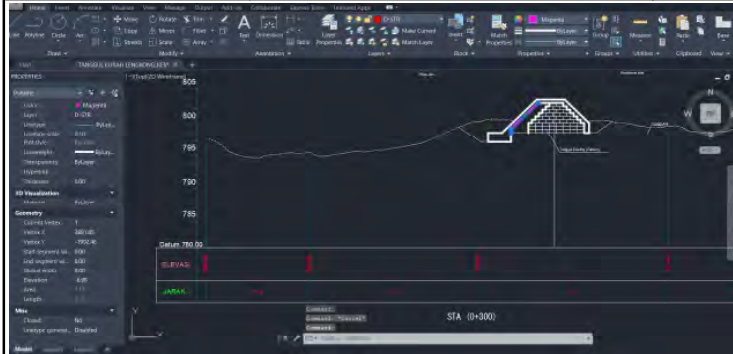
5	0+200				
	Area	6,12			
	Length	50,00			
		V= 6.12 x 50.00			
				306,00	m ²



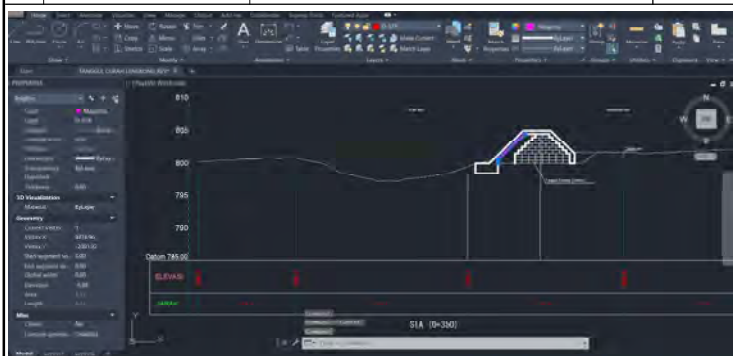
6	0+250				
	Area	6,12			
	Length	50,00			
		V= 6.12 x 50.00			
				306,00	m ²



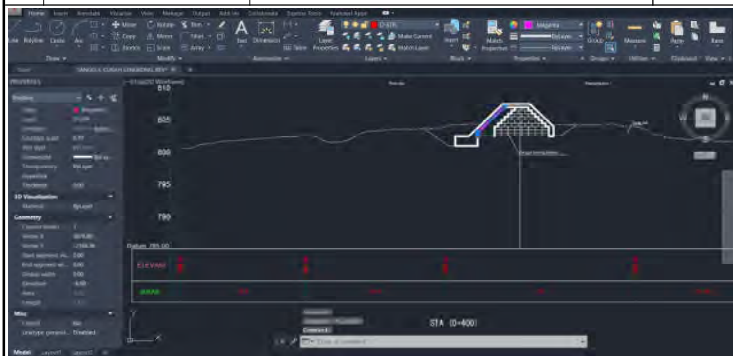
7	0+300				
	Area	6,12			
	Length	50,00			
		V= 6.12 x 50.00		306,00	m ²



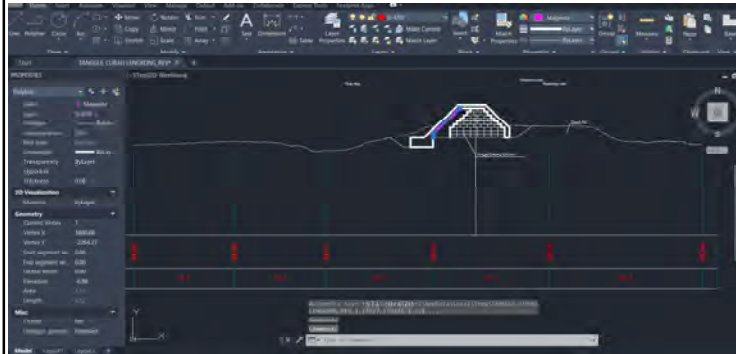
8	0+350				
	Area	6,12			
	Length	50,00			
		V= 6.12 x 50.00		306,00	m ²



9	0+400				
	Area	6,12			
	Length	50,00			
		V= 6.12 x 50.00		306,00	m ²



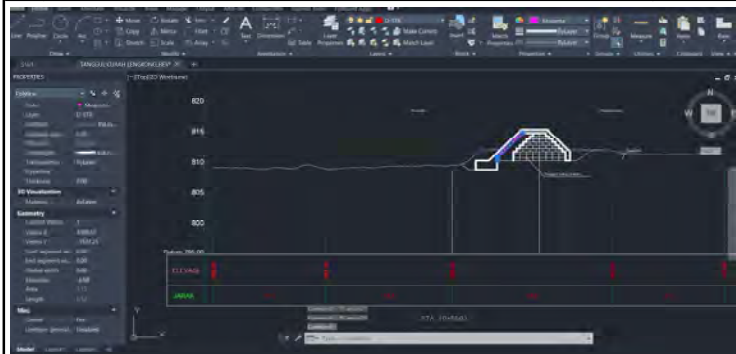
10	0+450				
	Area	6,12			
	Length	50,00			
		V= 6.12 x 50.00			
				306,00	m ²



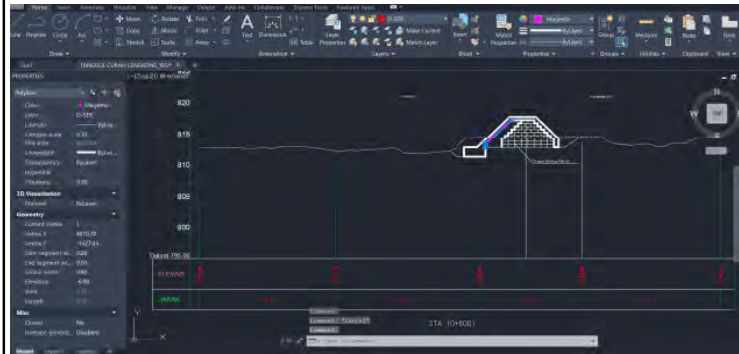
11	0+500				
	Area	6,12			
	Length	50,00			
		V= 6.12 x 50.00			
				306,00	m ²



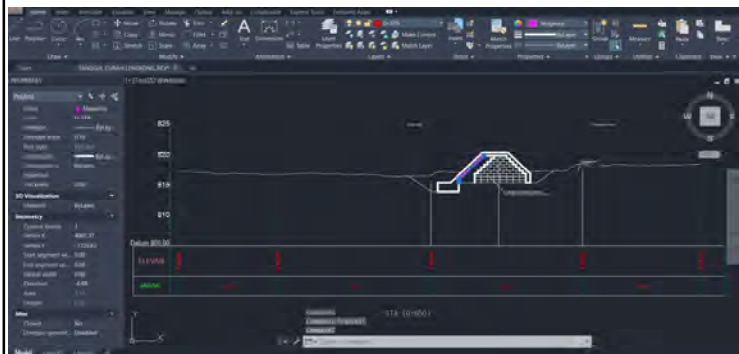
12	0+550				
	Area	6,12			
	Length	50,00			
		V= 6.12 x 50.00			
				306,00	m ²



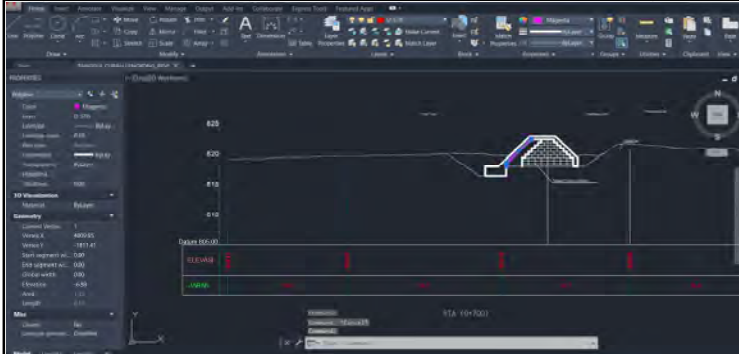
13	0+600				
	Area	6,12			
	Length	50,00			
		$V= 6.12 \times 50.00$			
				306,00	m ²



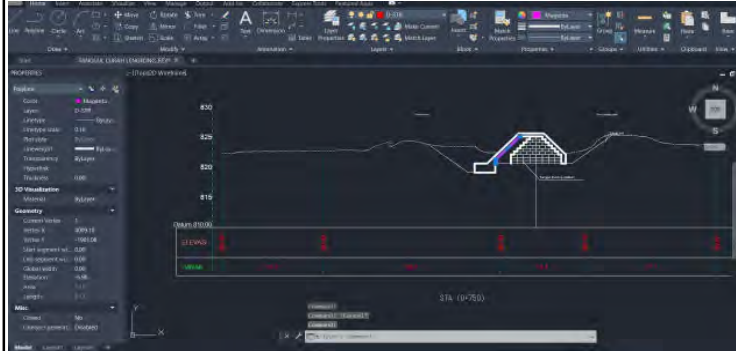
14	0+650				
	Area	6,12			
	Length	50,00			
		$V= 6.12 \times 50.00$			
				306,00	m ²



15	0+700				
	Area	6,12			
	Length	50,00			
		$V= 6.12 \times 50.00$			
				306,00	m ²



16	0+750				
	Area	6,12			
	Length	50,00			
		V= 6.12 x 50.00			
				306,00	m ³



17	0+800				
	Area	6,12			
	Length	50,00			
		V= 6.12 x 50.00			
				306,00	m ³



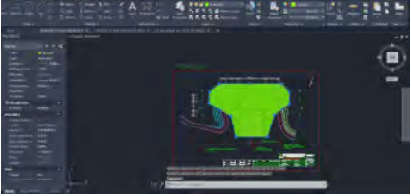
18	0+850				
	Area	6,12			
	Length	50,00			
		V= 6.12 x 50.00			
				306,00	m ³



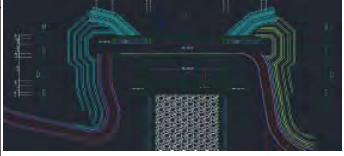
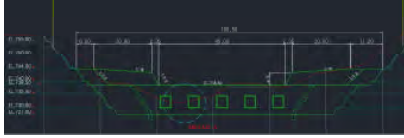
19	0+900			
	Area	6,12		
	Length	50,00		
		$V = 6.12 \times 50.00$		
			306,00	m ²

			Non Exposed Wall Formwork Total Volume =	5.814,00	m²
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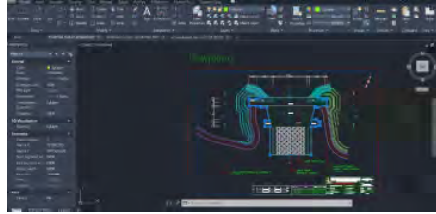
QUANTITY SUMMARY CD PELINTAS CURAH LENGKONG 2			
No.	Description	Unit	Volume
A PREPARATION WORK			
1	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	9,910,27
2	1 m Excavation Cross Profile	m	434,00
3	Bowplank Installation	m'	384,17
B DEMOLITION WORKS			
1	Demolition with 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)	m3	900,00
C EARTHWORKS			
1	Mechanical Sand Excavation	m3	80,662,74
2	Backfill Sand (Material from Excavation, Mechanically)	m3	1359,52
D CONCRETE WORK			
1	Concrete Making and Casting $f_c' = 30$ Mpa (K 350) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	4,313,48
2	Concrete Making and Casting $f_c' = 20$ Mpa (K 225) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	3,222,44
3	Cyclops Concrete 60% Concrete $f_c' = 15$ Mpa: 40% Split Stone, with Concrete Pump (CP)	m3	12,507,18
4	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	6,599,37
5	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	12,407,19
6	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	6,599,37
7	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	5,807,82
8	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	5,807,82
9	Construction Joint Filler	m3	42,06
10	1 kg Slab reinforcement for BjTP or BjTS diameter > 12 mm Semi-Mechanical method	Kg	44,459,74
11	Irregular Riprap, Less Dense-Many Cavities, Height Difference 0-1 m & Mechanical Tidying	m3	2,909,06
12	Weep Hole	m	553,00
E RIVER WATERING & DEWATERING WORK			
1	1 Piece of Sand Geobag Size 145 x 240 cm	Buah	70,00
2	Backfill Sand (Material from Excavation, Mechanically)	m3	43,50

Name Structure : : CD Pelintas Curah Lengkong 2					
Type of work : Stake Out Trase					
No.	Description	Calculation	Volume	Unit	Drawing reference
1		9910,27	9.910,27	m ²	
					
Stake Out Trase Total Volume =					

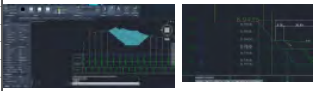





Name Structure :		: CD Pelintas Curah Lengkong 2				
Type of work		: Cross Profile				
No.	Description	Calculation	Volume	Unit	Drawing reference	
1	Maindam span =	108,50	m		The assumption taken is that the longest span is at the Main Dam	
	Measure each section =	4,00	section	434,00	m	Section B, C, D, E
		Cross Profile Total Volume =		434,00	m	

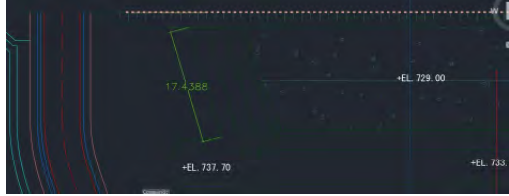

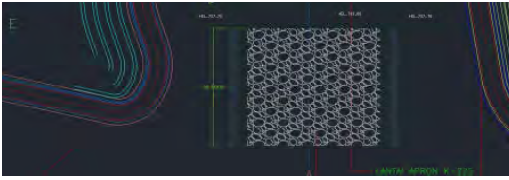




Name Structure : CD Pelintas Curah Lengkong 2					
Type of work : Bowplank					
No.	Description	Calculation	Volume	Unit	Drawing reference
1	Volume	384,17	384,17	m'	
		Bowplank Total Volume =			
			384,17	m'	



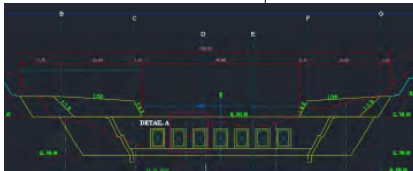
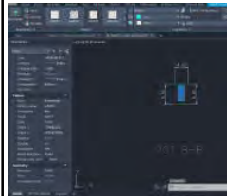
Name Structure :		CD Pelintas Curah Lengkong 2			
Type of work :		Demolition			
No.	Description	Calculation	Volume	Unit	Drawing reference
1	Dimensions =	22,00 x 5,00	m2		Image Source: Inventory Report by YEC
	Width =	5,00	m		
2	Dimensions =	14,00 x 5,00	m2		
	Width =	5,00	m		
	Volume =	900,00	m3		
<p>CD PELINTAS CURAH LENGKONG 2 (DOWNSTREAM VIEW) SKALA 1:100</p>					
Demolition Total Volume =			900,00	m³	

Name Structure :		: CD Pelintas Curah Lengkong 2			
Type of work :		: Sand Excavation			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	STA 0+050				
	Area	1110,71			
	Length	8,943			
		$V = \frac{(1.110,71)}{2} \times 8,94$	4.966,55	m ³	
2	STA 0+075				
	Area	312,05			
	Length	25,000			
		$V = \frac{(1.110,71 + 312,05)}{2} \times 25,00$	17.784,50	m ³	
3	STA 0+100				
	Area	481,76			
	Length	25,000			
		$V = \frac{(481,76 + 481,76)}{2} \times 25,00$	9.922,55	m ³	
4	STA 0+125				
	Area	954,77			
	Length	25,000			
		$V = \frac{(481,76 + 954,77)}{2} \times 25,00$	17.956,55	m ³	
5	STA 0+150				
	Area	723,49			
	Length	25,00			
		$V = \frac{(954,77 + 723,49)}{2} \times 25,00$	20.978,18	m ³	
6	STA 0+175				
	Area	0,87			
	Length	25,00			
		$V = \frac{(723,49 + 0,87)}{2} \times 25,00$	9.054,41	m ³	
Sand Excavation Total Volume =			80.662,74	m³	

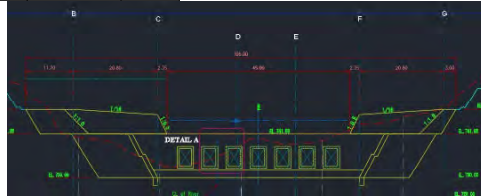
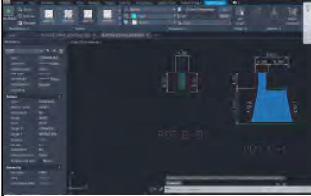
Name Structure :		: CD Pelintas Curah Lengkong 2			
Type of work :		: Backfill Sand			
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	POT. C-C				
	Area =	20,64 m ²			
	Length =	17,44 m'			
	Volume =	359,89 m ³			
	Total Volume =		359,89	m ³	
		 			
B.	POT. E-E				
	Area =	11,76 m ²			
	Length =	38,50 m'			
	Volume =	452,88 m ³			
	Total Volume =		452,88	m ³	
		 			
B.	POT. F-F BUFFER FILL				
	Area =	12,15 m ²			
	Spillway Length =	45,00 m'			
	Volume =	546,75 m ³			
	Total Volume =		546,75	m ³	
					
Backfill Total Volume =			1.359,52	m³	

Name Structure : CD Pelintas Curah Lengkung 2
 Type of work : Cyclops Concrete (Main Dam)

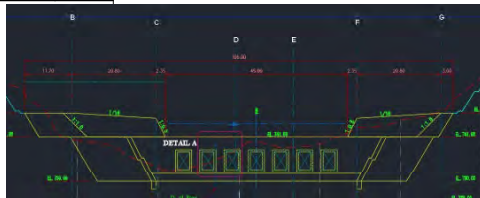
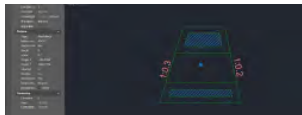
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Section B-B				
	Area =	10,01 m ²			
	Length =	11,70 m'			
	Volume =	117,08 m ³			
	Total Volume =		117,08	m ³	



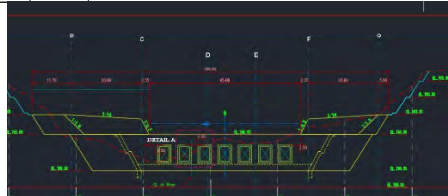
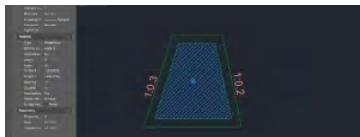
B.	Section C-C				
	Area =	109,06 m ²			
	Length =	23,15 m'			
	Volume =				
	Total Volume =			m ³	

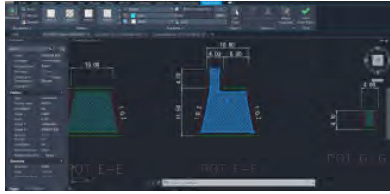

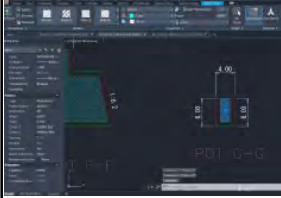
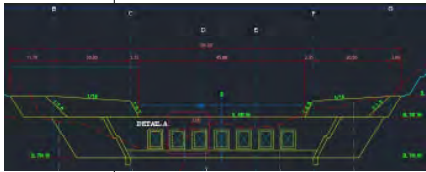


C.	Section D-D				
	Area =	18,81 m ²			
	Width 1 piece Drip Hole =	3,00 m'			
	Number of drip holes =	7,00 pcs			
	Volume =	394,98 m ³			
	Total Volume =		394,98	m ³	

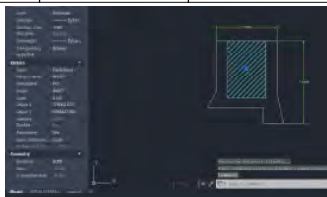
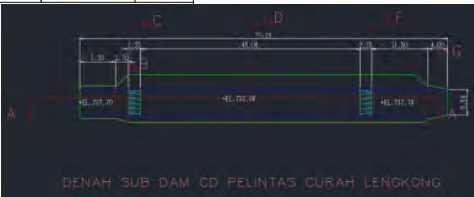
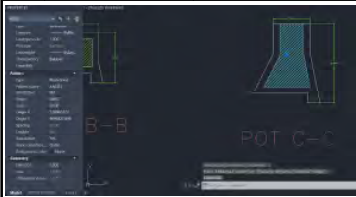
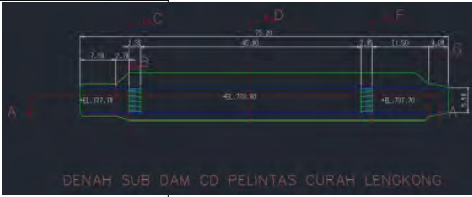


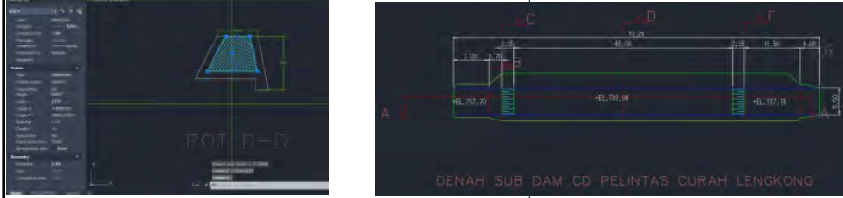
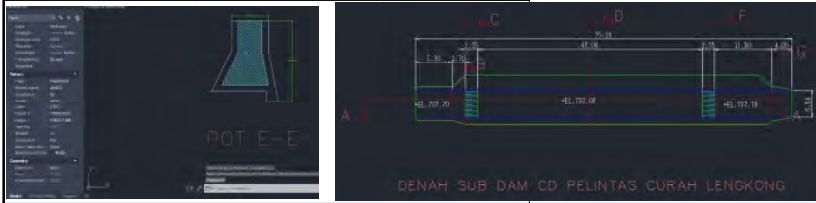
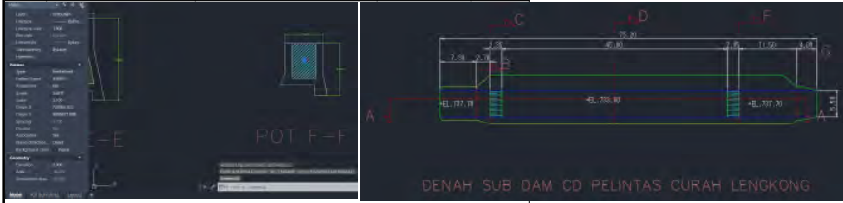
D.	Section E-E				
	Area =	64,71 m ²			
	Width 1 piece Drip Hole =	3,00 m'			
	Total of 2 m Width =	6,00 pcs			
	Remaining Width to Edge =	5,00 m'			
	Volume =	1488,24 m ³			
	Total Volume =		1.488,24	m ³	



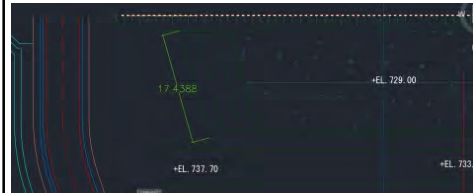

E	Section F-F	Area = 109,06 m ² Length = 23,15 m' Volume = 2524,69 m ³				
					2.524,69	m ³
						
F	Section G-G	Area = 10,01 m ² Length = 3,00 m' Volume = 30,02 m ³				
		Total Volume =			30,02	m ³
						
Cyclops Concrete Sub Total Volume =					4.555,01	m³

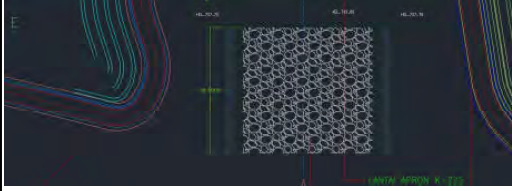

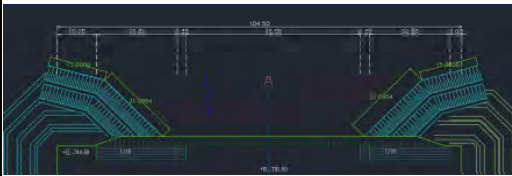

Name Structure : CD Pelintas Curah Lengkong 2
 Type of work : Cyclops Concrete (Sub Dam)


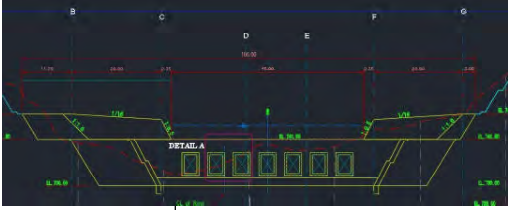
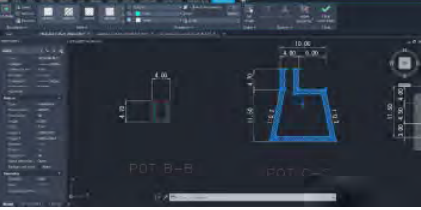

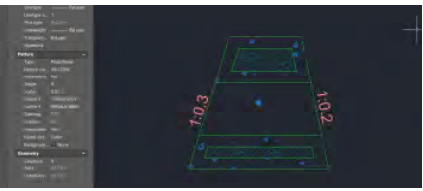

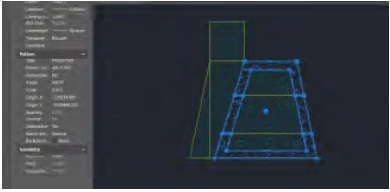
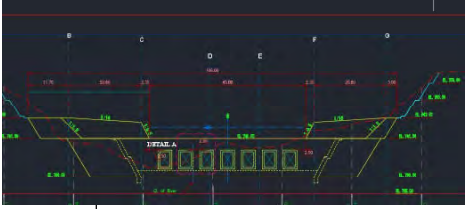
No.	Description	Calculation	Volume	Unit	Drawing Reference	
A	Section B-B	Area = 18,20 m ² Length = 7,30 m' Volume = 132,86 m ³				
		Total Volume =	132,86	m ³		
						
B	Section C-C	Area = 42,09 m ² Length = 5,05 m' Volume = 212,56 m ³				
		Total Volume =	212,56	m ³		
						

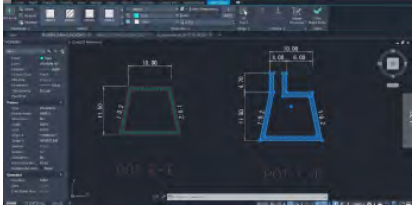
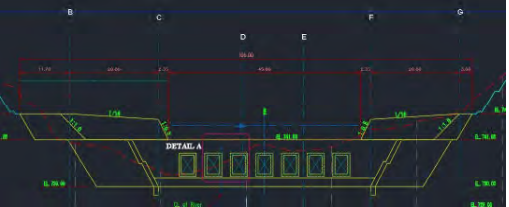
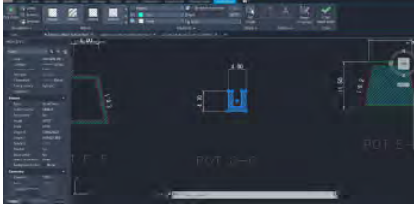
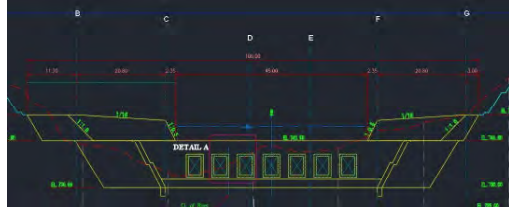
C. Section D-D		Area = 25,56 m ²			
		Length = 45,00 m'			
		Volume = 1149,98 m ³			
		Total Volume =	1.149,98	m ³	
					
D. Section E-E		Area = 47,09 m ²			
		Length = 13,85 m'			
		Volume = 582,97 m ³			
		Total Volume =	582,97	m ³	
					
E Section F-F		Area = 18,20 m ²			
		Length = 4,00 m'			
		Volume = 72,80 m ³			
		Total Volume =	72,80	m ³	
					
		Cyclops Concrete Sub Total Volume =	2.151,17	m³	

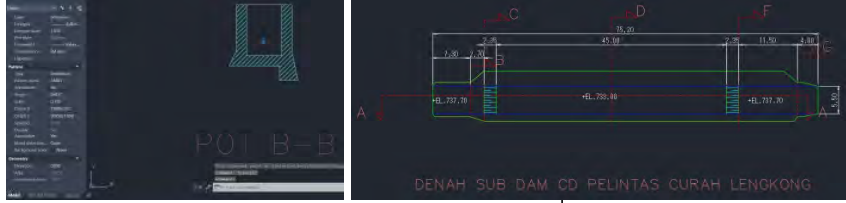
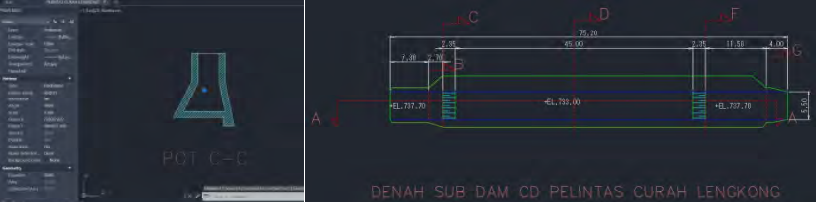
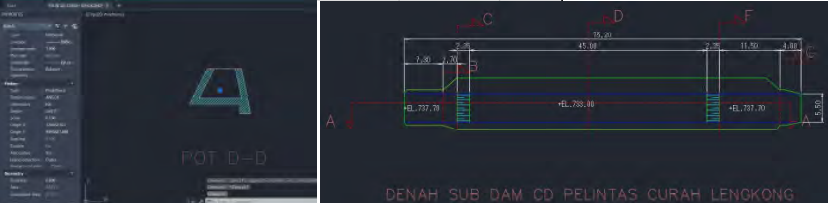
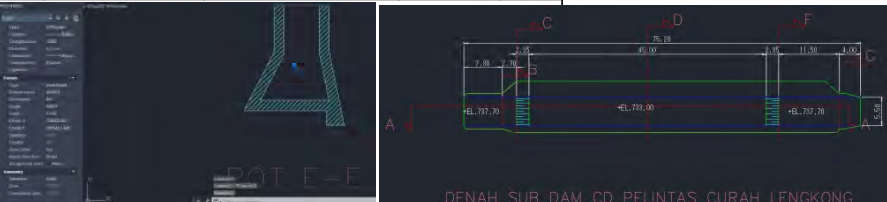
Name Structure : CD Pelintas Curah Lengkung 2
Type of work : Cyclops Concrete (Apron Retaining Wall)

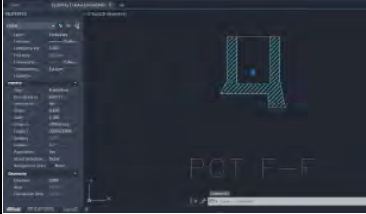

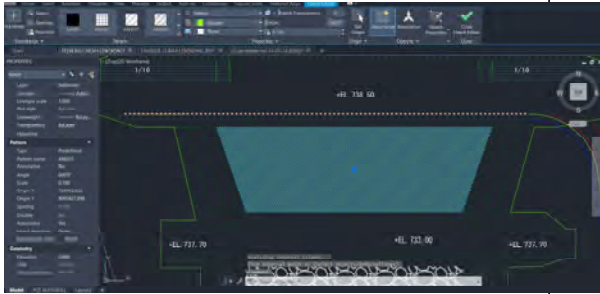
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	POT. C-C	Area = 52,00 m ²			
		Length = 17,44 m'			
		Volume = 906,85 m ³			
	Total Volume =	906,85	m ³		
					
					

B. POT. E-E					
	Area =	49,77	m ²		
	Length =	38,50	m'		
	Volume =	1916,15	m ³		
	Total Volume =			1.916,15	m ³
					
B. POT. F-F BUFFER FILL					
	Area =	24,50	m ²		
	Numbers of Buffer Fill =	2,00	bu; Kanan-Kiri		
	Length =	36,10	m'		
	Volume =	1768,67	m ³		
	Total Volume =			1.768,67	m ³
					
B. Left bank protection					
	Area =	13,44	m ²		
	Numbers of Buffer Fill =		pcs		
	Length =	90,00	m'		
	Volume =	1209,33	m ³		
	Total Volume =			1.209,33	m ³
				Cyclops Concrete Sub Total Volume =	5.800,99 m³
				Cyclops Concrete Total Volume =	12.507,18 m³

Name Structure :		: CD Pelintas Curah Lengkong 2				
Type of work		: Concrete K-350 (Main Dam)				
No.	Description	Calculation	Volume	Unit	Drawing Reference	
A.	Section B-B					
	Area =	14,01 m ²				
	Length =	11,70 m'				
	Volume =	163,88 m ³				
	Total Volume =		163,88	m ³		
						
B.	Section C-C					
	Area =	51,19 m ²				
	Length =	23,15 m'				
	Volume =	1185,09 m ³				
	Total Volume =		1.185,09	m ³		
						
C.	Section D-D					
	Area =	42,19 m ²				
	Width 1 piece Drip Hole =	3,00 m'				
	Number of drip holes =	7,00 pcs				
	Volume =	886,02 m ³				
	Total Volume =		886,02	m ³		
						
D.	Section E-E					
	Area =	37,36 m ²				
	Width 1 piece Drip Hole =	3,00 m'				
	Total of 2 m Width =	6,00 pcs				
	Remaining Width to Edge =	5,00 m'				
	Volume =	859,19 m ³				
	Total Volume =		859,19	m ³		
						

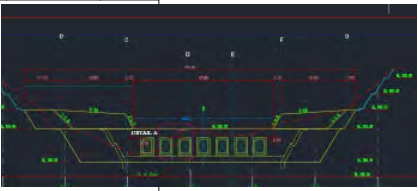
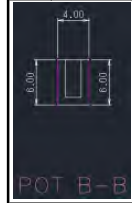
C	Section F-F	Area =	51,19	m ²				
		Length =	23,15	m'				
		Volume =	1185,09	m ³				
							1.185,09	m ³
								
D	Section G-G	Area =	11,40	m ²				
		Length =	3,00	m'				
		Volume =	34,20	m ³				
		Total Volume =					34,20	m ³
								
		Concrete K-350 Total Volume =		4.313,48 m³				

Name Structure :		: CD Pelintas Curah Lengkong 2			
Type of work :		: Concrete K-225 (Sub Dam)			
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Section B-B				
	Area =	19,16 m ²			
	Length =	7,30 m ¹			
	Volume =	139,85 m ³			
	Total Volume =		139,85	m ³	
					
B.	Section C-C				
	Area =	31,83 m ²			
	Length =	5,05 m ¹			
	Volume =	160,76 m ³			
	Total Volume =		160,76	m ³	
					
C.	Section D-D				
	Area =	22,45 m ²			
	Length =	45,00 m ¹			
	Volume =	1010,30 m ³			
	Total Volume =		1.010,30	m ³	
					
D.	Section E-E				
	Area =	31,83 m ²			
	Length =	13,85 m ¹			
	Volume =	440,89 m ³			
	Total Volume =		440,89	m ³	
					

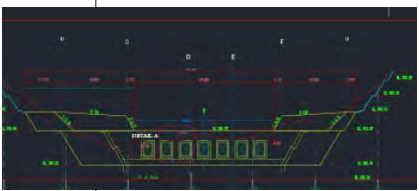
E	Section F-F					
		Area =	19,52	m ²		
		Length =	4,00	m ¹		
		Volume =	78,07	m ³		
					78,07	m ³
						
				Concrete K-225 Sub Total Volume =	1.829,85	m³
Name Structure :		: CD Pelintas Curah Lengkong 2				
Type of work		: Concrete K-225 (Floor Apron)				
No.	Description	Calculation	Volume	Unit	Drawing Reference	
A.	Apron Slab					
		Area =	696,30	m ²		
		Length =	2,00	m ¹		
		Volume =	1392,59	m ³		
		Total Volume =			1.392,59	m ³
				Concrete K-225 Sub Total Volume = 1.392,59 m³		
				Concrete K-225 Total Volume =	3.222,44	m³

Name Structure : CD Pelintas Curah Lengkung 2
 Type of work : Expose Wall Formwork (Main Dam)

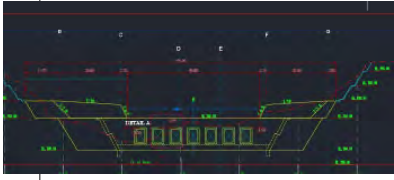
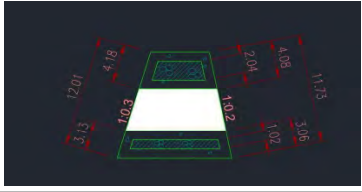
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Section B-B				
	Formwork height =	12,00 m'			
	Length =	11,70 m'			
	Volume =	140,40 m2			
	Total Volume =		140,40	m2	



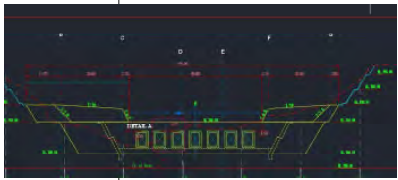
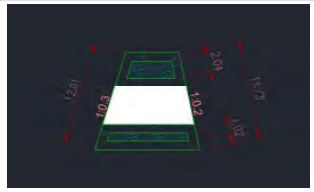
B.	Section C-C				
	Formwork height =	32,86 m'			
	Length =	23,15 m'			
	Volume =	760,71 m2			
	Total Volume =		760,71	m2	

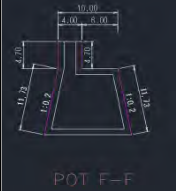
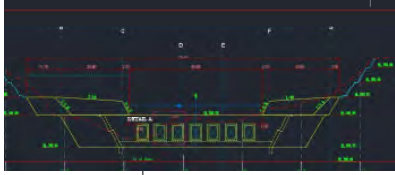

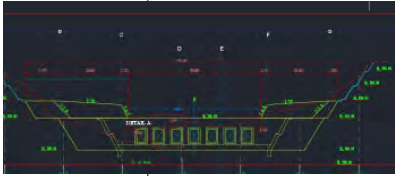


C.	Section D-D				
	Formwork height =	22,45 m'			
	Drip Hole Width =	3,00 m'			
	Numbers of Drip Holes =	7,00 buah			
	Volume =	471,45 m2			
	Drip Hole Wall Area's =	41,06 m2			
	Numbers of Wall Side =	2,00 buah			
	Numbers of drip holes =	7,00 buah			
	Volume =	574,88 m2			
	Total Volume =		1.046,33	m2	


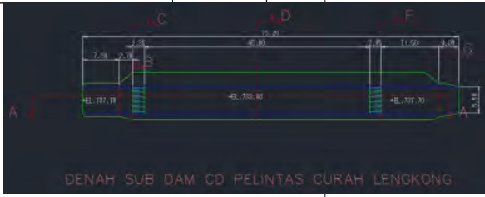
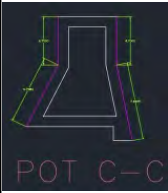
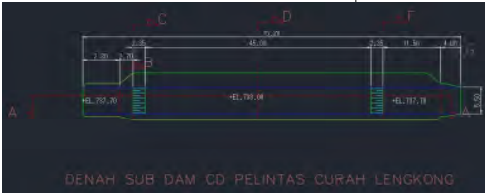



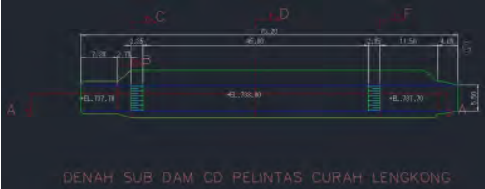
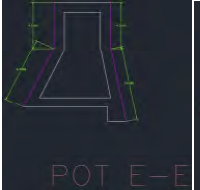
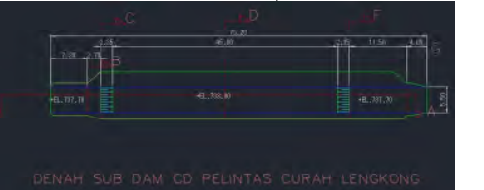
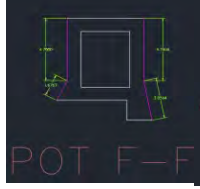
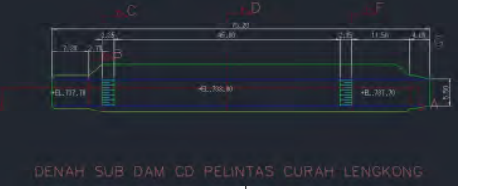
D.	Section E-E				
	Numbers of Wall Side =	23,74 m'			
	Width 1 piece Drip Hole =	3,00 m'			
	Total of 2 m Width =	6,00 buah			
	Remaining Width to Edge =	5,00 m'			
	Volume =	546,02 m2			
Total Volume =		546,02	m2		




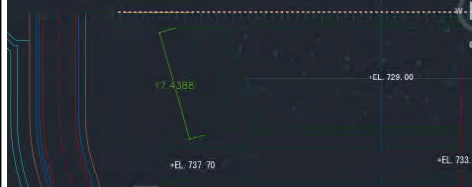
E. Section F-F	Formwork height =	32,86	m'		
	Length =	23,15	m'		
	Volume =	760,71	m2		
	Total Volume =			760,71	m2
					
E Section G-G	Formwork height =	12,00	m'		
	Length =	3,00	m'		
	Volume =	36,00	m2		
	Total Volume =			36,00	m2
					
			Total Formwork =	3.290,17	m2

Name Structure : CD Pelintas Curah Lengkong 2
Type of work : Expose Wall Formwork (Sub Dam)


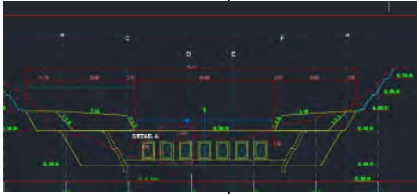
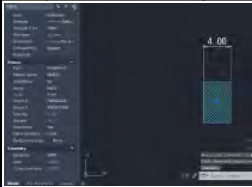
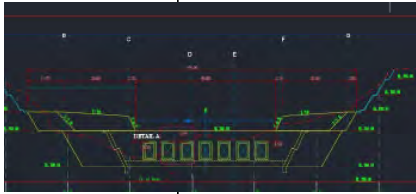
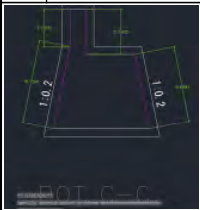
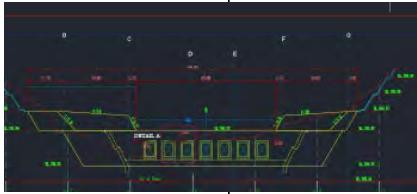
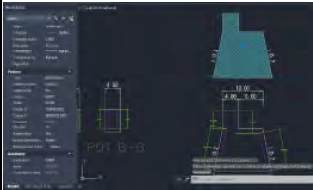
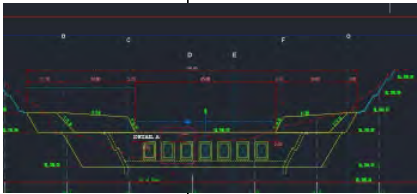
No.	Description	Calculation	Volume	Unit	Drawing Reference
A. Section B-B	Formwork height =	14,14	m'		
	Length =	7,30	m'		
	Volume =	103,19	m2		
	Total Volume =			103,19	m2
					
B. Section C-C	Formwork height =	23,76	m'		
	Length =	5,05	m'		
	Volume =	119,97	m2		
	Total Volume =			119,97	m2
					

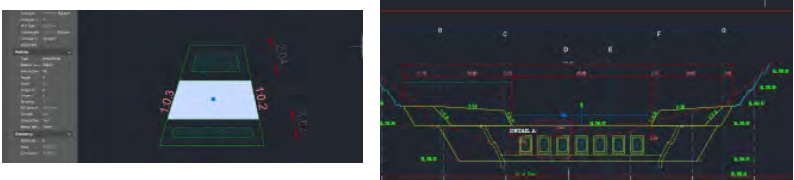
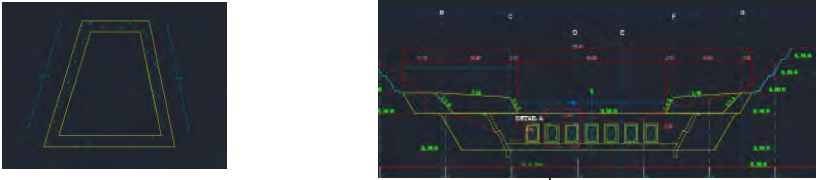

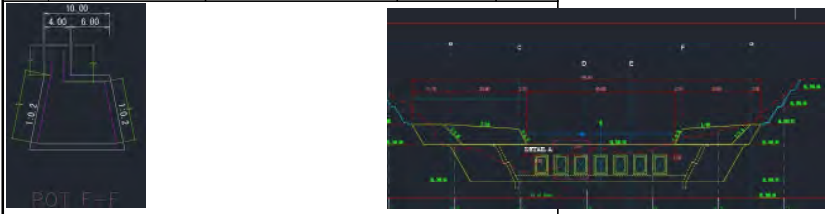
C.	Section D-D				
	Formwork height =	14,36	m'		
	Length =	45,00	m'		
	Volume =	646,07	m ²		
	Total Volume =			646,07	m ²
					
D.	Section E-E				
	Formwork height =	23,76	m'		
	Length =	13,85	m'		
	Volume =	329,03	m ²		
	Total Volume =			329,03	m ²
					
E	Section F-F				
	Formwork height =	14,14	m'		
	Length =	4,00	m'		
	Volume =	56,54	m ²		
	Total Volume =			56,54	m ²
					
			Expose Wall Formwork Sub Total Volume =	1.254,81	m²

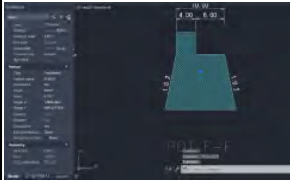
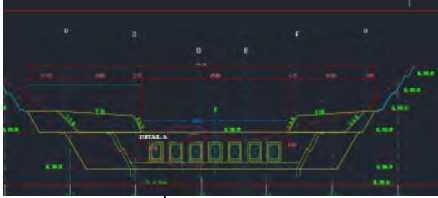

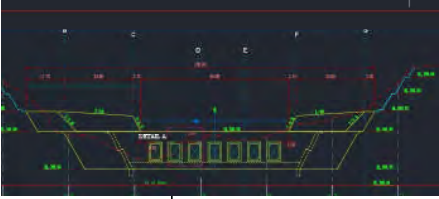

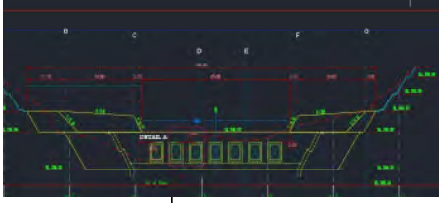
Name Structure : CD Pelintas Curah Lengkok 2
Type of work : Expose Wall Formwork (Apron Retaining Wall)

No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	POT. C-C				
	Formwork height =	14,74	m'		
	Length =	17,44	m'		
	Numbers of Retaining Wall =	2,00	pcs Right & Left		
	Volume =	514,16	m ²		
Total Volume =			514,16	m ²	
					

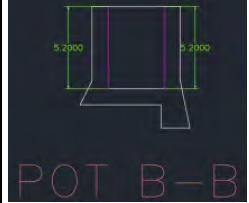
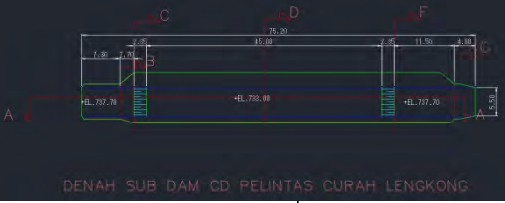
B. POT. E-E					
Formwork height =	6,71	m'			
Length =	38,50	m'			
Numbers of Retaining Wall =	2,00	pcs Right & Left			
Volume =	516,53	m ³			
Total Volume =			516,53	m ³	
C. POT. F-F BUFFER FILL					
Formwork height =	14,18	m'			
Length =	2,00	pcs Right & Left			
Numbers of Retaining Wall =	36,10	m'			
Volume =	1023,69	m ³			
Total Volume =			1.023,69	m ³	
Expose Wall Formwork Sub Total Volume =			2.054,39	m³	
Expose Wall Formwork Total Volume =			6.599,37	m³	

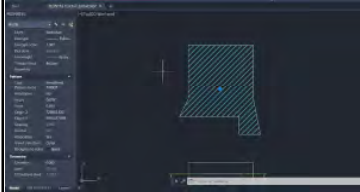
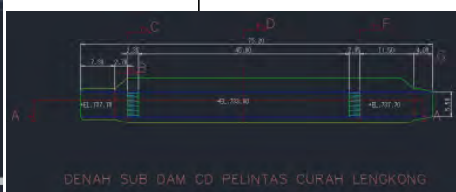
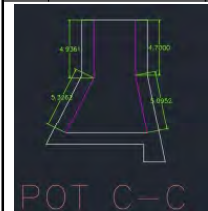

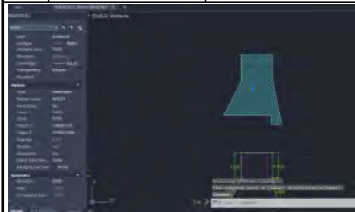
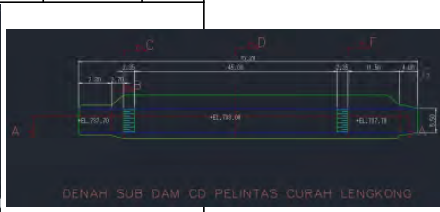
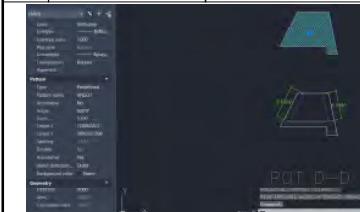
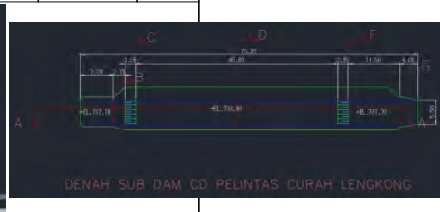
Name Structure :		CD Pelintas Curah Lengkung 2			
Type of work :		Non Expose Wall Formwork (Main Dam)			
No.	Description	Calculation	Volume	Unit	Drawing reference
A.	Section B-B				
	Formwork height =	10,00 m'			
	Length =	11,70 m'			
	Volume =	117,00 m ²			
	Total Volume =		117,00	m ²	
 					
B	Section B-B Joint				
	Area Formwork =	24,00 m ²			
	Numbers of Formwork =	2,00 pcs Right & Left			
	Volume =	48,00 m ²			
	Total Volume =		48,00	m ²	
 					
C.	Section C-C				
	Formwork height =	30,79 m'			
	Length =	23,15 m'			
	Volume =	712,84 m ²			
	Total Volume =		712,84	m ²	
 					
D.	Section C-C Joint				
	Area Formwork =	160,25 m ²			
	Numbers of Formwork =	3,00 pcs Right & left			
	Volume =	480,75 m ²			
	Total Volume =		480,75	m ²	
 					


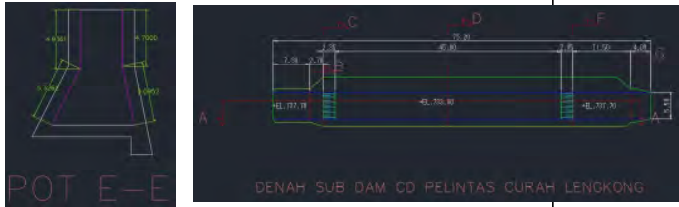
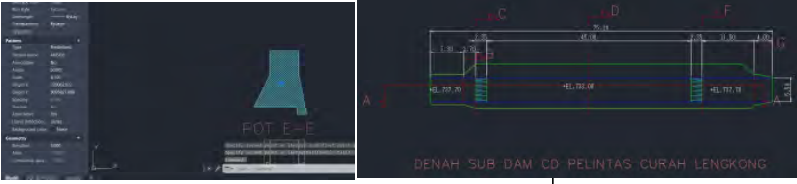
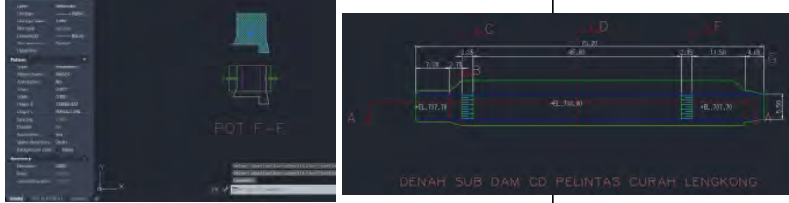
E. Section D-D					
Formwork Height =	6,12	m'			
Drip holes width =	3,00	m'			
Numbers of drip holes =	7,00	pcs			
Volume =	128,52	m2			
Drip Hole Wall Area's =	41,06	m2			
Numbers of Wall Side =	2,00	pcs			
Numbers of drip holes =	7,00	pcs			
Volume =	574,88	m2			
Total Volume =			703,40	m2	
					
F. Section E-E					
Formwork Height =	19,61	m'			
Width 1 piece Drip Hole =	3,00	m'			
Total of 2 m Width =	6,00	pcs			
Remaining Width to Edge =	5,00	m'			
Volume =	450,95	m2			
Total Volume =			450,95	m2	
					
G. Section E-E Joint					
Area Formwork =	102,06	m2			
Numbers of Formwork =	4,00	Bu: Ka-Ki			
Volume =	408,25	m2			
Total Volume =			408,25	m2	
					
H. Section F-F					
Formwork Height =	30,79	m'			
Length =	23,15	m'			
Volume =	712,84	m2			
Total Volume =			712,84	m2	
					

I. Section F-F Joint	Area Formwork = 160,25	m ²			
	Numbers of Formwork = 3,00	pcs Right & left			
	Volume = 480,75	m ²			
	Total Volume =		480,75	m ²	
					
J. Section G-G	Formwork Height = 10,00	m'			
	Length = 3,00	m'			
	Volume = 30,00	m ²			
	Total Volume =		30,00	m ²	
					
K. Section G-G Joint	Area Formwork = 24,00	m ²			
	Numbers of Formwork = 2,00	pcs Right & left			
	Volume = 48,00	m ²			
	Total Volume =		48,00	m ²	
					
			Total Formwork =	4.192,78	m ²

Name Structure : : CD Pelintas Curah Lengkong 2
Type of work : Non Expose Wall Formwork (Sub Dam)

No.	Description	Calculation	Volume	Unit	Drawing reference
A. Section B-B	Formwork height = 10,40	m'			
	Length = 7,30	m'			
	Volume = 75,92	m ²			
	Total Volume =		75,92	m ²	
					

B	Section B-B Joint				
	Area Formwork =	37,36	m ²		
	Numbers of Formwork =	2,00	pcs Ka-Ki		
	Volume =	74,73	m ²		
	Total Volume =			74,73	m ²
		 			
C.	Section C-C				
	Formwork height =	20,06	m'		
	Length =	5,05	m'		
	Volume =	101,29	m ²		
	Total Volume =			101,29	m ²
		 			
D.	Section C-C Joint				
	Area Formwork =	73,93	m ²		
	Numbers of Formwork =	2,00	pcs Ka-Ki		
	Volume =	147,85	m ²		
	Total Volume =			147,85	m ²
		 			
E.	Section D-D				
	Formwork height =	10,69	m'		
	Length =	45,00	m'		
	Volume =	481,01	m ²		
	Total Volume =			481,01	m ²
		 			

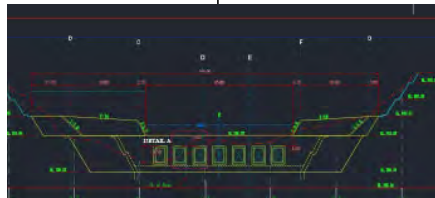
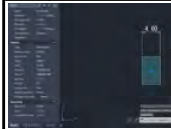
F. Section D-D Joint					
	Area Formwork =	48,07	m ²		
	Numbers of Formwork =	4,00	pcs Ka-Ki		
	Volume =	192,27	m ²		
	Total Volume =			192,27	m ²
					
G. Section E-E					
	Formwork height =	20,06	m'		
	Length =	13,85	m'		
	Volume =	277,80	m ²		
	Total Volume =			277,80	m ²
					
H. Section E-E Joint					
	Area Formwork =	73,93	m ²		
	Numbers of Formwork =	2,00	pcs Ka-Ki		
	Volume =	147,85	m ²		
	Total Volume =			147,85	m ²
					
I. Section F-F					
	Formwork height =	10,40	m'		
	Length =	4,00	m'		
	Volume =	41,60	m ²		
	Total Volume =			41,60	m ²
					

J. Section F-F Joint					
Area Formwork =	37,36	m2			
Numbers of Formwork =	2,00	pcs Ka-Ki			
Volume =	74,73	m2			
Total Volume =			74,73	m2	

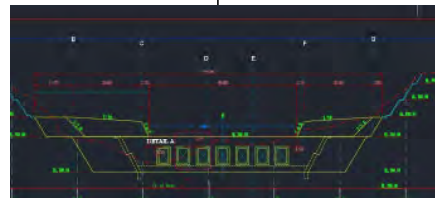
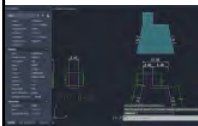
Non Expose Wall Formwork Sub Total Volume =	1.615,04	m2
Non Expose Wall Formwork Total Volume =	5.807,82	m2

Name Structure : CD Pelintas Curah Lengkong 2
 Type of work : Joint Filler (Main Dam)

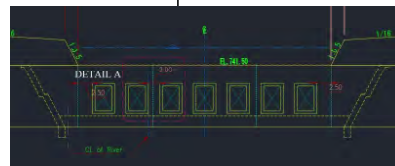
No.	Description	Calculation	Volume	Unit	Drawing reference
A.	Section B-B Joint				
	Joint Filler Area =	24,00 m ²			
	Numbers of Joint Filler =	2,00 pcs Ka-Ki			
	Volume =	48,00 m ²			
	Total Volume =		48,00	m ²	



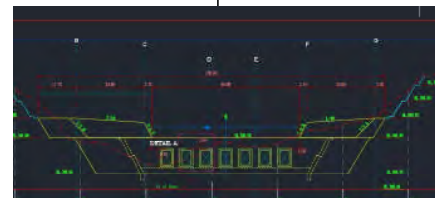
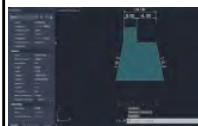
B.	Section C-C Joint				
	Joint Filler Area =	160,25 m ²			
	Numbers of Joint Filler =	3,00 Buz Ka-Ki			
	Volume =	480,75 m ²			
	Total Volume =		480,75	m ²	

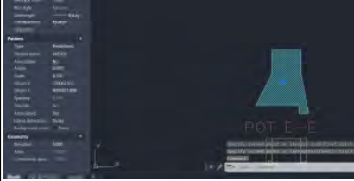
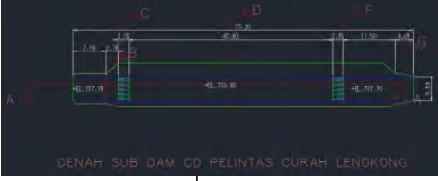

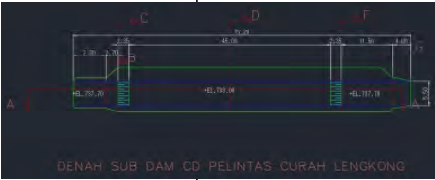


C.	Section E-E Joint				
	Joint Filler Area =	102,06 m ²			
	Numbers of Joint Filler =	4,00 Buz Ka-Ki			
	Volume =	408,25 m ²			
	Total Volume =		408,25	m ²	



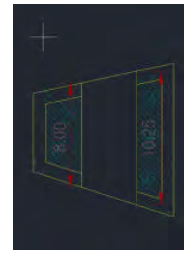
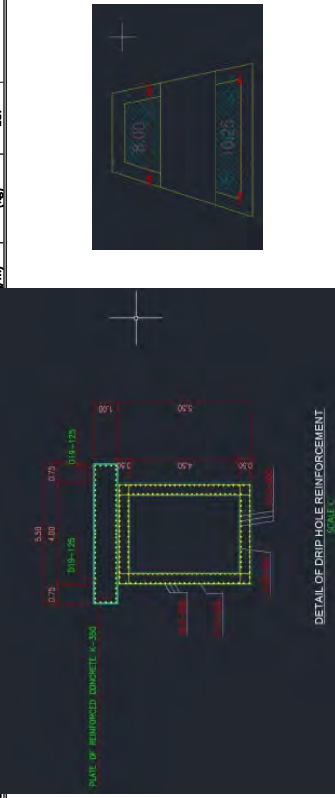
I.	Section F-F Joint				
	Joint Filler Area =	160,25 m ²			
	Numbers of Joint Filler =	3,00 Buz Ka-Ki			
	Volume =	480,75 m ²			
	Total Volume =		480,75	m ²	



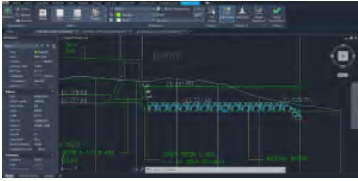
D.	Section E-E Joint				
	Joint Filler Area =	73,93	m2		
	Numbers of Joint Filler =	2,00	BuzKa-Ki		
	Volume =	147,85	m2		
	Total Volume =			147,85	m2
		 			
E.	Section F-F Joint				
	Joint Filler Area =	37,36	m2		
	Numbers of Joint Filler =	2,00	BuzKa-Ki		
	Volume =	74,73	m2		
	Total Volume =			74,73	m2
		 			
		Joint Filler Thickness =	0,02	m	
		Total Area Joint Filler =	637,42	m2	
		Joint Filler Sub Total Volume =	12,75	m3	
		Join Filler Total Volume =	42,06	m3	

Name Structure : CD Pelitias Curah Lengkong 2
 Type of work : Reinforcing Steel

No.	Code	Diameter (mm)	Distance (m)	Transverse Length (m)	Length (m)	Crown	Length Total (m)	Weight per m ³ (kg/m)	Weight Total (kg)	Numbers of bar	Weight Total (kg)	Noted
1 Slab Reinforcement (D19-125)												
1	Main Reinforcement Tul.Bagi	19	0.125	1.00	12.80	8	12.80	2.23	832	104	1855.36	
		19	0.125	1.00	8.00	8	8.00	2.23	832	65	1855.36	
2	Tul.Utama Tul.Bagi	19	0.125	1.00	12.80	8	12.80	2.23	832	104	1855.36	
		19	0.125	1.00	8.00	8	8.00	2.23	832	65	1855.36	
3	Tul.Utama Tul.Bagi	19	0.125	1.00	12.80	8	12.80	2.23	832	104	1855.36	
		19	0.125	1.00	8.00	8	8.00	2.23	832	65	1855.36	
4	Tul.Utama Tul.Bagi	19	0.125	1.00	12.80	8	12.80	2.23	832	104	1855.36	
		19	0.125	1.00	8.00	8	8.00	2.23	832	65	1855.36	
5	Tul.Utama Tul.Bagi	19	0.125	1.00	12.80	8	12.80	2.23	832	104	1855.36	
		19	0.125	1.00	8.00	8	8.00	2.23	832	65	1855.36	
6	Tul.Utama Tul.Bagi	19	0.125	1.00	12.80	8	12.80	2.23	832	104	1855.36	
		19	0.125	1.00	8.00	8	8.00	2.23	832	65	1855.36	
7	Tul.Utama Tul.Bagi	19	0.125	1.00	12.80	8	12.80	2.23	832	104	1855.36	
		19	0.125	1.00	8.00	8	8.00	2.23	832	65	1855.36	

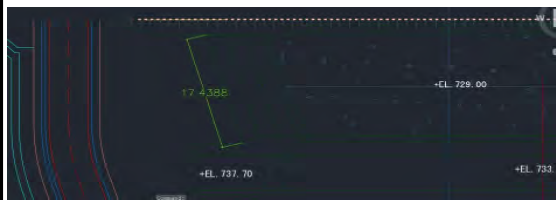


Drainage Hole Reinforcement (D13-200)												
1	Tul.Utama Tul.Bagi	13 13	0.2 0.2	1.00 1.00	34.00 10.25	10.25 34.00	1.04 1.04	1753 1802	171 53	1822.86 1874.08		
2	Tul.Utama Tul.Bagi	13 13	0.2 0.2	1.00 1.00	34.00 10.25	10.25 34.00	1.04 1.04	1753 1802	171 53	1822.86 1874.08		
3	Tul.Utama Tul.Bagi	13 13	0.2 0.2	1.00 1.00	34.00 10.25	10.25 34.00	1.04 1.04	1753 1802	171 53	1822.86 1874.08		
4	Tul.Utama Tul.Bagi	13 13	0.2 0.2	1.00 1.00	34.00 10.25	10.25 34.00	1.04 1.04	1753 1802	171 53	1822.86 1874.08		
5	Tul.Utama Tul.Bagi	13 13	0.2 0.2	1.00 1.00	34.00 10.25	10.25 34.00	1.04 1.04	1753 1802	171 53	1822.86 1874.08		
6	Tul.Utama Tul.Bagi	0 13	0.2 0.2	1.00 1.00	34.00 10.25	10.25 34.00	1.04 1.04	1753 1802	171 53	1822.86 1874.08		
7	Tul.Utama Tul.Bagi	13 13	0.2 0.2	1.00 1.00	34.00 10.25	10.25 34.00	1.04 1.04	1753 1802	171 53	1822.86 1874.08		
										Total kg / m	44459.74	kg
										Reinforcing Steel Total Weight Volume =	44,459.74	

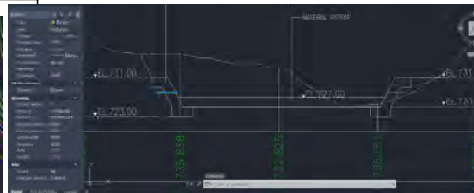
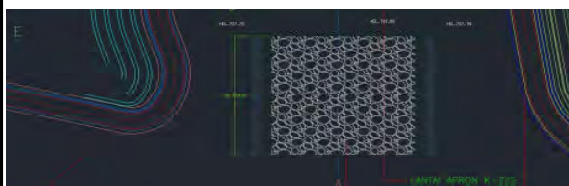
Name Structure : : CD Pelintas Curah Lengkong 2					
Type of work : Rip-Rap Boulder					
No.	Description	Calculation	Volume	Unit	Gambar
1					
	Area = Length =	75,56 m2 38,500 m	2.909,06	m ²	
Rip-Rap Boulder Total Volume =			2.909,06	m ³	

Name Structure : CD Pelintas Curah Lengkong 2
 Type of work : Weep Hole

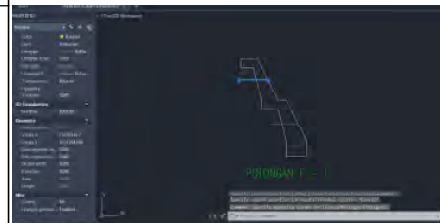
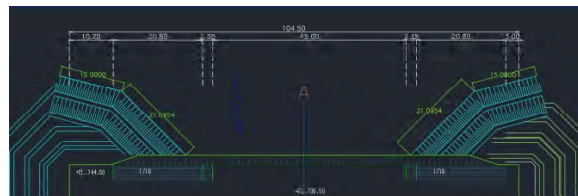
No.	Description	Calculation	Volume	Unit	Drawing reference
A.	POT. C-C				
	Weep Hole Length =	3,50 m'			
	Number of Weep Holes in 1 Section =	6,00 pcs			
	Wall Length =	17,44 m'			
	Jarak antar Weep Hole =	2,00 m			
	Distance between Weep Holes =	8,00 pcs			
	Volume =	168,00 m'			
	Total Volume =		168,00	m'	



B.	POT. E-E				
	Weep Hole Length =	3,50 m'			
	Number of Weep Holes in 1 Section =	2,00 pcs			
	Wall Length =	38,50 m'			
	Jarak antar Weep Hole =	2,00 m			
	Distance between Weep Holes =	19,00 pcs			
	Volume =	133,00 m'			
	Total Volume =		133,00	m'	



B.	POT. F-F BUFFER FILL				
	Weep Hole Length =	3,50 m'			
	Number of Weep Holes in 1 Section =	4,00 pcs			
	Wall Length =	36,10 m'			
	Jarak antar Weep Hole =	2,00 m			
	Distance between Weep Holes =	18,00 pcs			
	Volume =	252,00 m'			
	Total Volume =		252,00	m'	

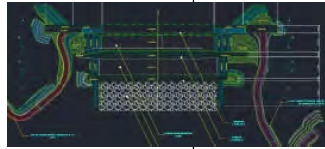
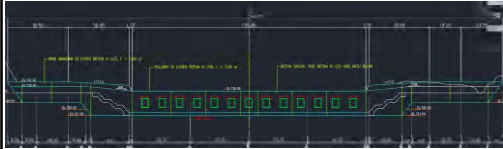


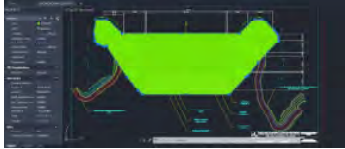
Weep Hole Total Volume = 553,00 m'



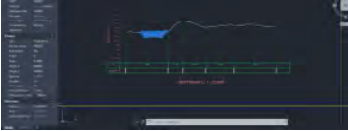

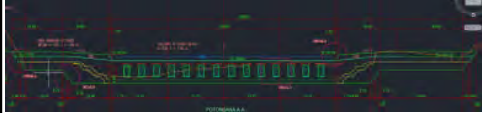
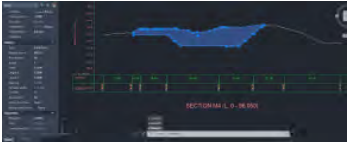
Name Structure :		: CD Pelintas Curah Lengkong 2			
Type of work :		: Geo Bag & Sandfill			
No.	Description	Calculation	Volume	Unit	Drawing reference
1					
	Number of Geobag =	7,00	Pcs		
	Fill Length =	25,000	m		
	Geobag Length =	2,400	m		
	Number of Geobags Lengthwise =	10,000	Pcs		
		Geo Bag Total Volume =	70,00	Pcs	
	Fill Area =	0,87	m ²		
	Length =	25	m		
	Fill Volume =	21,750	m ³		
	Moving Times =	2,000	Times		
	Total Volume =	43,500	m ³		
		Sand Fill Total Volume =	43,50	m ³	



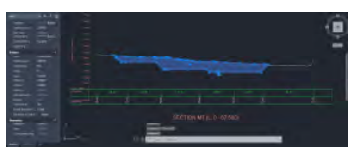

CD KOBOKAN 5 QUANTITY SUMMARY			
No.	Description	Unit	Volume
A	PREPARATION WORK		
1	Stake Out Trace of New Infrastructure & Wooden Stakes (Raft 5/7) Length 1 m	m2	27.839,96
2	1 m Excavation Cross Profile	m	1.713,00
3	Bowplank Installation	m'	795,83
B	DEMOLITION WORKS		
1	Demolition with RDB, Loading of Demolition Results (Rock $\phi > 25$ cm) and Transport, (mechanically, transported to the disposal area with a distance of up to 500 m)	m3	2.894,72
C	EARTHWORKS		
1	Mechanical Sand Excavation	m3	272.734,42
2	Backfill Sand (Material from Excavation, Mechanically)	m3	21.947,27
D	CONCRETE WORK		
1	Concrete Making and Casting $f_c' = 30$ Mpa (K 350) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	32.746,75
2	Concrete Making and Casting $f_c' = 20$ Mpa (K 225) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	16.826,00
3	Cyclops Concrete 60% Concrete $f_c' 15$ Mpa: 40% Split Stone, with Concrete Pump (CP)	m3	106.647,96
4	1 kg Slab reinforcement for BjTP or BjTS diameter > 12 mm Semi-Mechanical method	Kg	155.195,04
5	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	26.124,90
6	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2.50 m	m2	43.297,85
7	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	26.124,90
8	1 m2 Regular Formwork for Concrete Walls with Multiflex 12 mm or 18 mm	m2	17.172,96
9	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	17.172,96
10	Joint Filler	m	134,86
11	Weep Hole	m	1.309,00
12	Irregular Riprap, Less Dense-Many Cavities, Height Difference 0-1 m & Mechanical Tidying	m3	2.323,38
E	RIVER WORK And DEWATERING		
1	Geo Bag	Buah	400,00
2	Backfill Sand (Material from Excavation, Mechanically)	m3	4.176,00

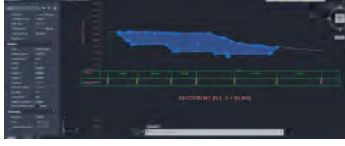
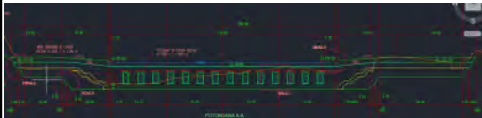
Name Structure :		: CD Kobokan 5				
Type of work		: Cross Profile				
No.	Description	Calculation	Volume	Unit	Drawing reference	
1	Maindam span =	285,50		m	The assumption taken is that the longest span is at the Section A, B, C, D, E, F	
	Measure each section =	6,00	section	1.713,00		m
		Cross Profile Total Volume =		1.713,00	m	



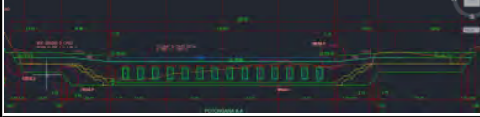
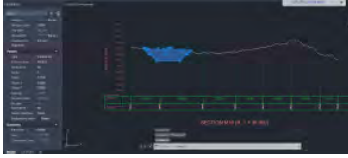
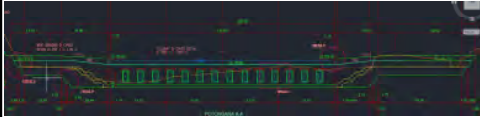
Name Structure : : CD Kobokan 5					
Type of work : Bowplank					
No.	Description	Calculation	Volume	Unit	Drawing reference
1	Volume	795,83	795,83	m'	
Total			795,83	m'	

Name Structure :		: CD Kobokan 5			
Type of work		: Sand Excavation			
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Section M1	Area = 499,54	m ²		
		Length = 8,20	m		
		Volume = 4096,23	m ³		
		Total Volume =		4.096,23	m ³
					
					
B.	Section M2	Area = 124,77	m ²		
		Length = 0,00	m		
		Volume = 0,00	m ³		
		Total Volume =		-	m ³
					
					
C.	Section M3	Area = 637,97	m ²		
		Length = 22,50	m		
		Volume = 8580,87	m ³		
		Total Volume =		8.580,87	m ³
					
					
D.	Section M4	Area = 819,13	m ²		
		Length = 2,70	m		
		Volume = 1967,09	m ³		
		Total Volume =		1.967,09	m ³
					
					

E. Section M5	Area =	1.771,07	m ²		
	Length =	3,10	m ¹		
	Volume =	4014,80	m ³		
	Total Volume =			4.014,80	m ³
 					
F. Section M6	Area =	878,30	m ²		
	Length =	22,00	m ¹		
	Volume =	29143,04	m ³		
	Total Volume =			29.143,04	m ³
 					
G. Section M7	Area =	757,29	m ²		
	Length =	1,75	m ¹		
	Volume =	1431,14	m ³		
	Total Volume =			1.431,14	m ³
 					
H. Section M8	Area =	498,95	m ²		
	Length =	33,75	m ¹		
	Volume =	21199,02	m ³		
	Total Volume =			21.199,02	m ³
 					

I. Section MC		Area = 1.364,25 m ²			
		Length = 33,75 m ¹			
		Volume = 31441,37 m ³			
	Total Volume =		31.441,37	m ³	
		 			
J. Section M9		Area = 1.892,23 m ²			
		Length = 33,75 m ¹			
		Volume = 54953,09 m ³			
	Total Volume =		54.953,09	m ³	
		 			
K. Section M10		Area = 1.597,17 m ²			
		Length = 33,75 m ¹			
		Volume = 58883,75 m ³			
	Total Volume =		58.883,75	m ³	
		 			
F. Section M11		Area = 1.221,18 m ²			
		Length = 1,75 m ¹			
		Volume = 2466,06 m ³			
	Total Volume =		2.466,06	m ³	
		 			

G. Section M12	Area =	2,050,08	m ²		
	Length =	19,00	m ¹		
	Volume =	31171,99	m ³		
	Total Volume =			31.171,99	m ³
 					
H. Section M13	Area =	403,20	m ²		
	Length =	5,80	m ¹		
	Volume =	7143,52	m ³		
	Total Volume =			7.143,52	m ³
 					
K. Section M14	Area =	87,09	m ²		
	Length =	50,00	m ¹		
	Volume =	12257,32	m ³		
	Total Volume =			12.257,32	m ³
 					
L. Section M15	Area =	487,18	m ²		
	Length =	0,00	m ¹		
	Volume =	0,00	m ³		
	Total Volume =			-	m ³
 					

I. Section M16		Area = 273,98 m ²		
		Length = 8,20 m ¹		
		Volume = 3120,74 m ³		
	Total Volume =		3.120,74	m ³
		 		
I. Section Remainder		Area = 0,00 m ²		
		Length = 6,31 m ¹		
		Volume = 664,40 m ³		
	Total Volume =		864,40	m ³
				
		Sand Excavation Total Volume =	272.734,42	m³

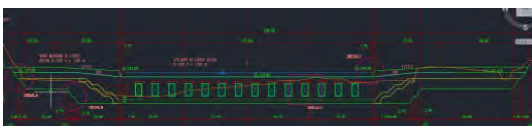

Name Structure : CD Kobokan 5
 Type of work : Backfill


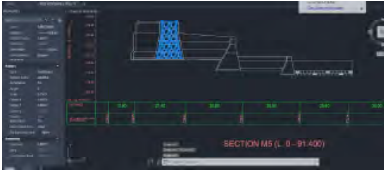
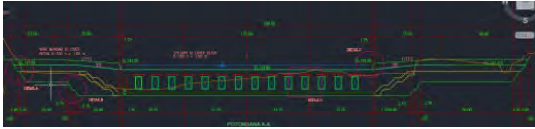
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Apron Right Wall Maindam				
	Area =	95,07 m ²			
	Length =	27,00 m'			
	Volume =	2566,87 m ³			
	Total Volume =		2.566,87	m ³	
B.	Apron Left Wall Maindam				
	Area =	149,76 m ²			
	Length =	23,70 m'			
	Volume =	3549,22 m ³			
	Total Volume =		3.549,22	m ³	
E.	Apron Right Wall Sub dam				
	Area =	38,71 m ²			
	Length =	32,00 m'			
	Volume =	1238,59 m ³			
	Total Volume =		1.238,59	m ³	
G.	Right Wall Bufferfill				
	Area =	217,96 m ²			
	Length =	54,36 m'			
	Volume =	11848,04 m ³			
	Total Volume =		11.848,04	m ³	

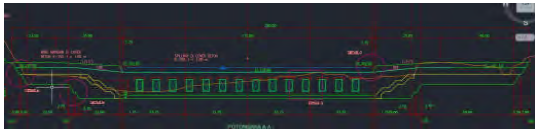

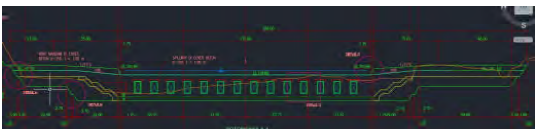

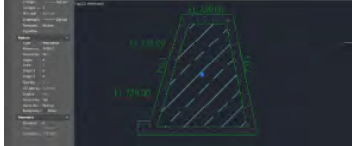
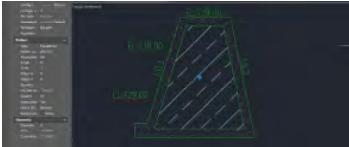
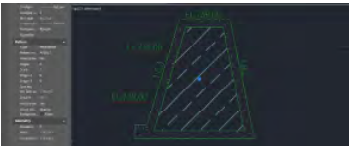
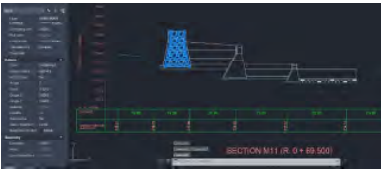
H. Left Wall Bufferfill	Area =	44,43	m ²		
	Length =	50,68	m'		
	Volume =	2251,58	m ³		
	Total Volume =			2.251,58	m ³
H. Sub Dam	Area =	78,25	m ²		
	Length =	6,30	m'		
	Volume =	492,98	m ³		
	Total Volume =			492,98	m ³
			Backfill Total Volume =	21.947,27	m³

Name Structure : CD Kobokan 5					
Type of work : Demolition					
No.	Description	Calculation	Volume	Unit	Drawing reference
1	Estimated width =	3,00 m			
	Estimated area =	964,91 m ²			
	Estimated volume =		2.894,72	m ³	
Demolition Total Volume =			2.894,72	m ³	





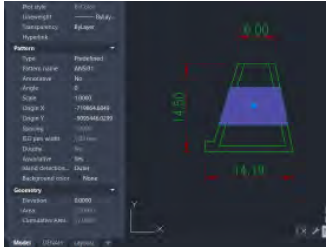

Name Structure : CD Kobokan 5
 Type of work : Cyclop Concrete (Maindam)

No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Section M1				
	Area =	93,83 m ²			
	Length =	8,20 m'			
	Volume =	769,44 m ³			
	Total Volume =		769,44	m ³	
					
B.	Section M2				
	Area =	93,83 m ²			
	Length =	0,00 m'			
	Volume =	0,00 m ³			
	Total Volume =		-	m ³	
					
C.	Section M3				
	Area =	85,83 m ²			
	Length =	22,50 m'			
	Volume =	1931,27 m ³			
	Total Volume =		1.931,27	m ³	
					
D.	Section M4				
	Area =	93,83 m ²			
	Length =	2,70 m'			
	Volume =	253,35 m ³			
	Total Volume =		253,35	m ³	
					

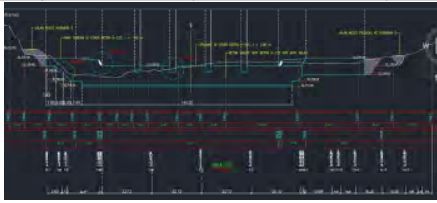
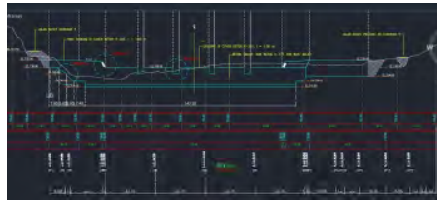
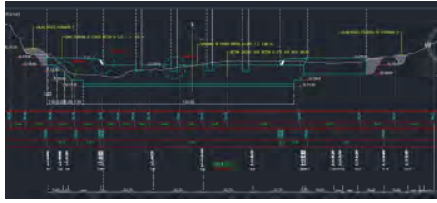

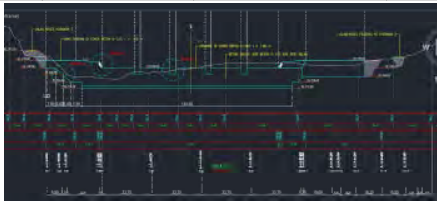

E. Section M5	Area =	187,92	m ²		
	Length =	3,10	m'		
	Volume =	582,54	m ³		
	Total Volume =			582,54	m ³
					
					
F. Section M6	Area =	187,92	m ²		
	Length =	22,00	m'		
	Volume =	4134,18	m ³		
	Total Volume =			4.134,18	m ³
					
					
G. Section M7	Area =	143,92	m ²		
	Length =	1,75	m'		
	Volume =	251,85	m ³		
	Total Volume =			251,85	m ³
					
					
H. Section M8	Area =	378,06	m ²		
	Length =	33,75	m'		
	Volume =	12759,47	m ³		
	Total Volume =			12.759,47	m ³
					
					

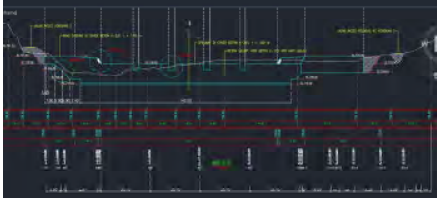

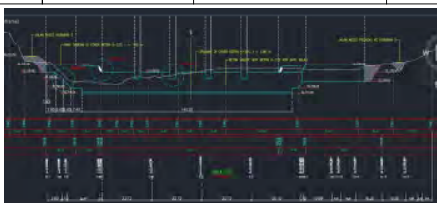




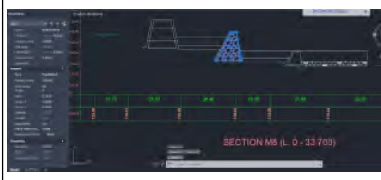
I. Section MC	Area =	378,06	m ²		
	Length =	33,75	m'		
	Volume =	12759,47	m ³		
	Total Volume =			12.759,47	m ³
					
J. Section M9	Area =	378,06	m ²		
	Length =	33,75	m'		
	Volume =	12759,47	m ³		
	Total Volume =			12.759,47	m ³
					
K. Section M10	Area =	378,06	m ²		
	Length =	33,75	m'		
	Volume =	12759,47	m ³		
	Total Volume =			12.759,47	m ³
					
L. Section M11	Area =	187,92	m ²		
	Length =	1,75	m'		
	Volume =	328,86	m ³		
	Total Volume =			328,86	m ³
					
					
					
					
					

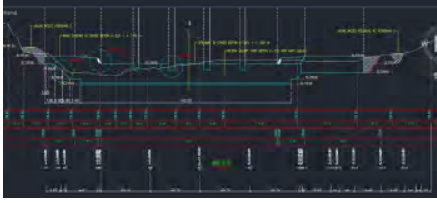

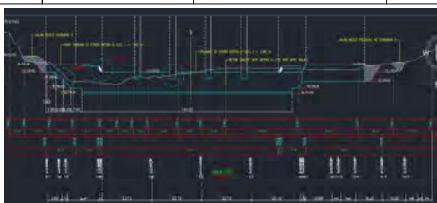





M. Section M12	Area =	187,92	m ²		
	Length =	19,00	m'		
	Volume =	3570,43	m ³		
	Total Volume =			3.570,43	m ³
 					
N. Section M13	Area =	93,83	m ²		
	Length =	5,80	m'		
	Volume =	544,24	m ³		
	Total Volume =			544,24	m ³
 					
O. Section M14	Area =	93,83	m ²		
	Length =	50,00	m'		
	Volume =	4691,71	m ³		
	Total Volume =			4.691,71	m ³
 					
P. Section M15	Area =	93,83	m ²		
	Length =	0,00	m'		
	Volume =	0,00	m ³		
	Total Volume =			-	m ³
 					

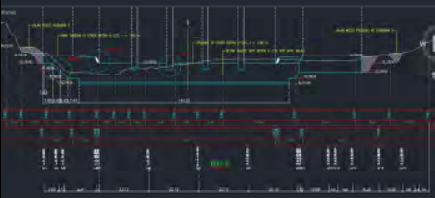

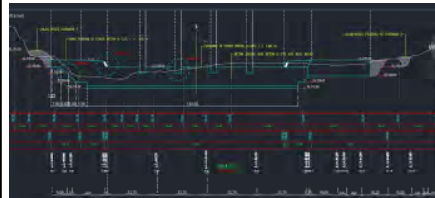

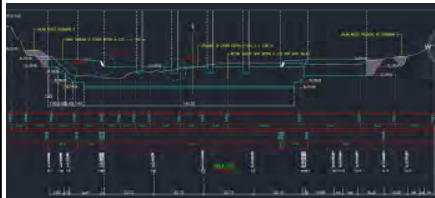

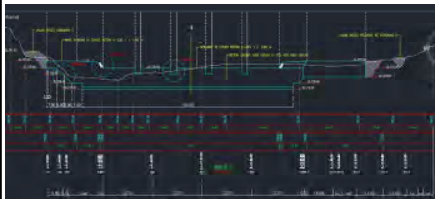
Q. Section M16	Area =	104,19	m ²		
	Length =	8,20	m'		
	Volume =	854,39	m ³		
	Total Volume =			854,39	m ³
 					
R. Section Remainder	Area =	104,19	m ²		
	Length =	6,31	m'		
	Volume =	657,44	m ³		
	Total Volume =			657,44	m ³
					
S. Reduced Drainage Hole Area	Area =	57,00	m ²		
	Drainage Hole Width =	3,00	m'		
	Number of Drainage Hole =	14,00	pcs		
	Volume =	2394,00	m ³		
	Total Volume =			2.394,00	m ³
  					
Maindam Cyclop Concrete Total Volume =				67.213,57	m³

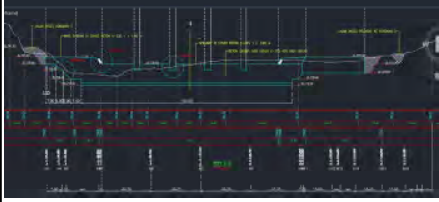
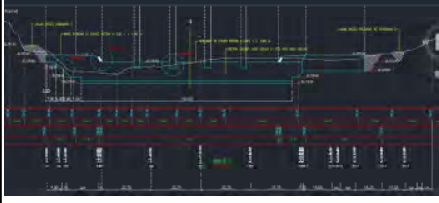

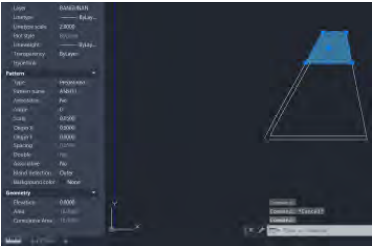
Name Structure : CD Kobokan 5
 Type of work : Cyclop Concrete (Subdam)

No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Section M1				
		Area = 0,00 m ²			
		Length = 8,20 m'			
		Volume = 0,00 m ³			
		Total Volume =	-	m ³	
					
B.	Section M2				
		Area = 0,00 m ²			
		Length = 8,55 m'			
		Volume = 0,00 m ³			
		Total Volume =	-	m ³	
					
C.	Section M3				
		Area = 11,25 m ²			
		Length = 1,25 m'			
		Volume = 14,06 m ³			
		Total Volume =	14,06	m ³	
					
					
D.	Section M4				
		Area = 47,89 m ²			
		Length = 2,70 m'			
		Volume = 129,30 m ³			
		Total Volume =	129,30	m ³	
					
					

E. Section M5	Area = 111,14 m ²				
	Length = 3,10 m'				
	Volume = 344,55 m ³				
	Total Volume =			344,55	m ³
					
F. Section M6	Area = 111,14 m ²				
	Length = 22,00 m'				
	Volume = 2445,18 m ³				
	Total Volume =			2.445,18	m ³
					
G. Section M7	Area = 101,14 m ²				
	Length = 1,75 m'				
	Volume = 177,00 m ³				
	Total Volume =			177,00	m ³
					
H. Section M8	Area = 99,83 m ²				
	Length = 33,75 m'				
	Volume = 3369,32 m ³				
	Total Volume =			3.369,32	m ³
					

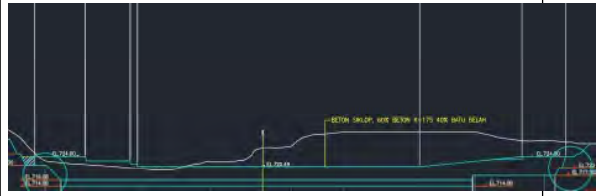
I. Section MC	Area = 99,83 m ² Length = 33,75 m' Volume = 3369,32 m ³								
	Total Volume =				3.369,32	m ³			
									
J. Section M9	Area = 99,83 m ² Length = 33,75 m' Volume = 3369,32 m ³								
	Total Volume =				3.369,32	m ³			
									
K. Section M10	Area = 101,14 m ² Length = 33,75 m' Volume = 3413,48 m ³								
	Total Volume =				3.413,48	m ³			
									
L. Section M11	Area = 111,14 m ² Length = 1,75 m' Volume = 194,50 m ³								
	Total Volume =				194,50	m ³			
									

M. Section M12	Area =	111,14	m ²		
	Length =	19,00	m'		
	Volume =	2111,75	m ³		
	Total Volume =			2.111,75	m ³
 					
N. Section M13	Area =	47,89	m ²		
	Length =	5,80	m'		
	Volume =	277,77	m ³		
	Total Volume =			277,77	m ³
 					
O. Section M14	Area =	26,74	m ²		
	Length =	50,00	m'		
	Volume =	1337,12	m ³		
	Total Volume =			1.337,12	m ³
 					
P. Section M15	Area =	0,00	m ²		
	Length =	0,00	m'		
	Volume =	0,00	m ³		
	Total Volume =			-	m ³
					

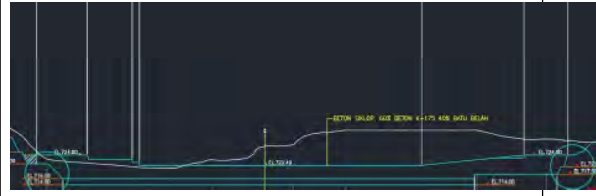
Q. Section M16	Area = 0,00	m ²			
	Length = 8,20	m'			
	Volume = 0,00	m ³			
	Total Volume =			-	m ³
					
R. Section Remainder	Area = 0,00	m ²			
	Length = 6,31	m'			
	Volume = 0,00	m ³			
	Total Volume =			-	m ³
					
S. Reduced Drainage Hole Area	Area = 18,00	m ²			
	Drainage Hole Width = 4,00	m'			
	Number of Drainage Hole = 4,00	pcs			
	Volume = 288,00	m ³			
	Total Volume =		288,00		m ³
 					
Subdam Cyclop Concrete Sub Total Volume =			20.264,67 m ³		

Name Structure : CD Kobokan 5
 Type of work : Cyclop Concrete (Sub-Sub dam)

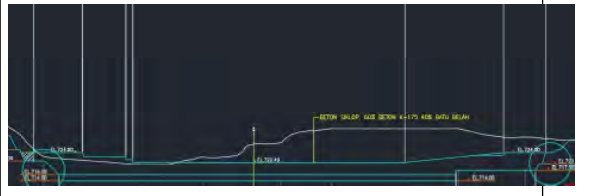
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Section M1				
	Area =	0,00 m ²			
	Length =	8,20 m'			
	Volume =	0,00 m ³			
	Total Volume =			-	m ³



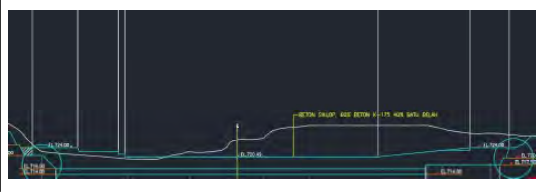
B.	Section M2				
	Area =	0,00 m ²			
	Length =	8,55 m'			
	Volume =	0,00 m ³			
	Total Volume =			-	m ³

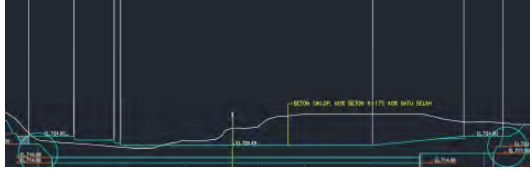










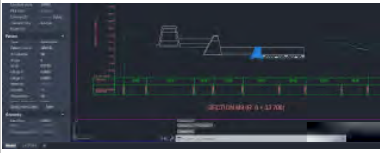


C.	Section M3				
	Area =	0,00 m ²			
	Length =	18,25 m'			
	Volume =	0,00 m ³			
	Total Volume =			-	m ³



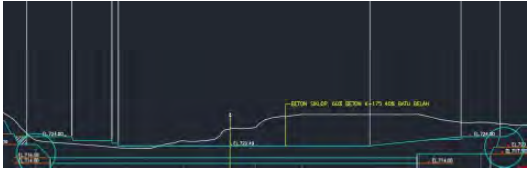


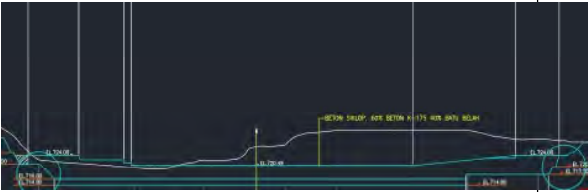


D.	Section M4				
	Area =	6,25 m ²			
	Length =	3,60 m'			
	Volume =	22,50 m ³			
	Total Volume =			22,50	m ³



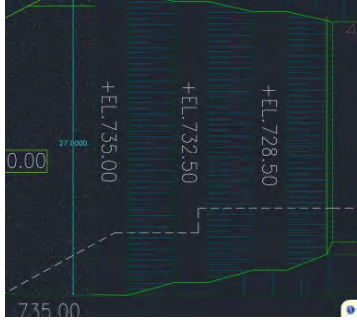

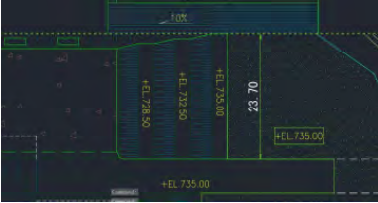
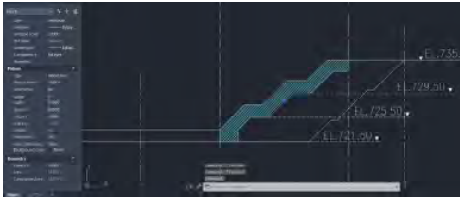

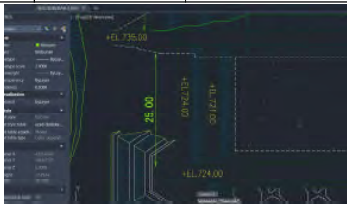


E. Section M5	Area = 38,16 m ²			
	Length = 3,10 m'			
	Volume = 118,29 m ³			
	Total Volume =		118,29	m ³
 				
F. Section M6	Area = 38,16 m ²			
	Length = 22,00 m'			
	Volume = 839,46 m ³			
	Total Volume =		839,46	m ³
 				
G. Section M7	Area = 30,65 m ²			
	Length = 1,75 m'			
	Volume = 53,64 m ³			
	Total Volume =		53,64	m ³
 				
H. Section M8	Area = 29,35 m ²			
	Length = 33,75 m'			
	Volume = 990,42 m ³			
	Total Volume =		990,42	m ³
 				



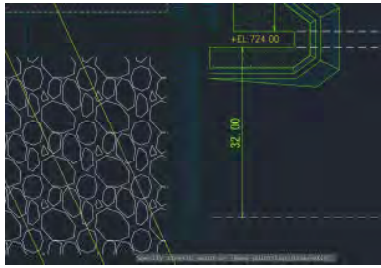
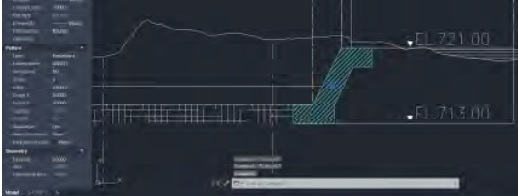

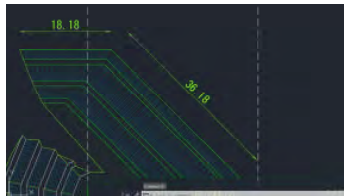
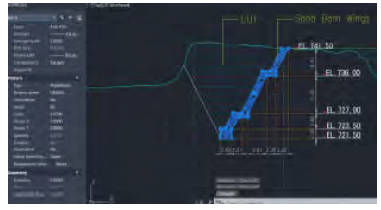
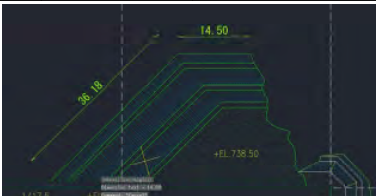
I.	Section MC Area = 29,35 m ² Length = 33,75 m' Volume = 990,42 m ³ Total Volume =		990,42 m ³		
J.	Section M9 Area = 29,35 m ² Length = 33,75 m' Volume = 990,42 m ³ Total Volume =		990,42 m ³		
K.	Section M10 Area = 30,65 m ² Length = 33,75 m' Volume = 1034,57 m ³ Total Volume =		1.034,57 m ³		
L.	Section M11 Area = 38,16 m ² Length = 1,75 m' Volume = 66,78 m ³ Total Volume =		66,78 m ³		


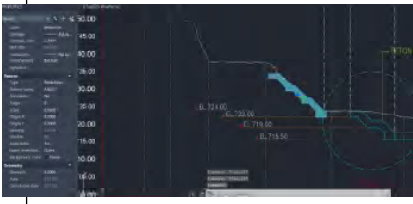
M. Section M12	Area = 38,16 m ²			
	Length = 19,00 m'			
	Volume = 724,99 m ³			
	Total Volume =		724,99	m ³
 				
N. Section M13	Area = 6,25 m ²			
	Length = 5,80 m'			
	Volume = 36,25 m ³			
	Total Volume =		36,25	m ³
 				
O. Section M14	Area = 0,00 m ²			
	Length = 50,00 m'			
	Volume = 0,00 m ³			
	Total Volume =		-	m ³
				
P. Section M15	Area = 0,00 m ²			
	Length = 0,00 m'			
	Volume = 0,00 m ³			
	Total Volume =		-	m ³
				

Q. Section M16	Area = 0,00 m ²			
	Length = 8,20 m'			
	Volume = 0,00 m ³			
	Total Volume =		-	m ³
R. Section Remainder	Area = 0,00 m ²			
	Length = 6,31 m'			
	Volume = 0,00 m ³			
	Total Volume =		-	m ³
Sub-Sub dam Cyclop Concrete Sub Total Volume =				5.867,75 m³

Name Structure : CD Kobokan 5
 Type of work : Cyclop Concrete (Retaining Wall)

No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Apron Right Wall Maindam	Area = 54,90 m ²			
		Length = 27,00 m'			
		Volume = 1482,29 m ³			
		Total Volume =	1.482,29	m ³	
					
B.	Apron Left Wall Maindam	Area = 54,90 m ²			
		Length = 23,70 m'			
		Volume = 1301,11 m ³			
		Total Volume =	1.301,11	m ³	
					
C.	Apron Right Wall Subdam	Area = 33,50 m ²			
		Length = 25,00 m'			
		Volume = 837,50 m ³			
		Total Volume =	837,50	m ³	
					
D.	Apron Left Wall Subdam	Area = 33,50 m ²			
		Length = 27,00 m'			
		Volume = 904,50 m ³			
		Total Volume =	904,50	m ³	
					

E.	Apron Right Wall Sub-Dam Area = 24,89 m ² Length = 32,00 m' Volume = 796,48 m ³			
				
F.	Apron Left Wall Sub-Dam Area = 24,89 m ² Length = 32,00 m' Volume = 796,48 m ³			
				
G.	Right Wall Bufferfill Area = 35,65 m ² Length = 64,36 m' Volume = 2294,43 m ³			
				
H.	Left Wall Bufferfill Area = 35,65 m ² Length = 50,68 m' Volume = 1806,74 m ³			
				

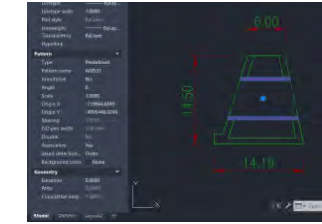
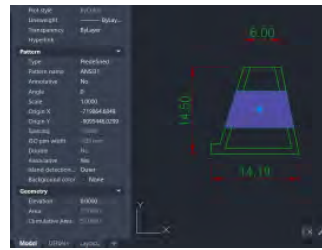
I.	Right Wall Protection				
	Area =	34,72	m ²		
	Length =	88,78	m'		
	Volume =	3082,44	m ³		
	Total Volume =			3.082,44	m ³
					
			Retaining Wall Cyclop Concrete Sub Total Volume =	13.301,97	m ³
			Cyclop Concrete Total Volume =	106.647,96	m ³

Name Structure : CD Kobokan 5
 Type of work : Concrete K-350

No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Section M1	Area = 34,62 m ²			
		Length = 8,20 m'			
		Volume = 283,85 m ³			
		Total Volume =	283,85	m ³	
					
B.	Section M2	Area = 34,62 m ²			
		Length = 0,00 m'			
		Volume = 0,00 m ³			
		Total Volume =	-	m ³	
					
C.	Section M3	Area = 34,62 m ²			
		Length = 22,50 m'			
		Volume = 778,86 m ³			
		Total Volume =	778,86	m ³	
					
D.	Section M4	Area = 34,62 m ²			
		Length = 2,70 m'			
		Volume = 93,46 m ³			
		Total Volume =	93,46	m ³	
					

E.	Section M5	Area = 56,30	m ²		
		Length = 3,10	m'		
		Volume = 174,53	m ³		
		Total Volume =		174,53	m ³
					
					
F.	Section M6	Area = 56,30	m ²		
		Length = 22,00	m'		
		Volume = 1238,61	m ³		
		Total Volume =		1.238,61	m ³
					
					
G.	Section M7	Area = 45,30	m ²		
		Length = 1,75	m'		
		Volume = 79,28	m ³		
		Total Volume =		79,28	m ³
					
					
A.	Spillway Main Dam	Area = 188,28	m ²		
		Spillway Length = 135,00	m'		
		Volume = 25418,43	m ³		
		Total Volume =		25.418,43	m ³
					
					

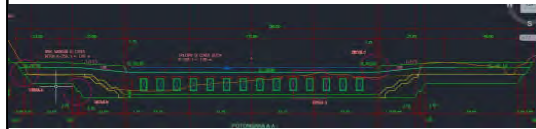
A. Drain Hole			
Area =	9,50	m ²	
Drainage Holes Width =	3,00	m'	
Numbers of Drainage Holes =	14,00	pcs	
Volume =	399,00	m ³	
Area =	57,00	m ²	
Drainage Holes Thickness =	0,50	m'	
Numbers of Drainage Hole Wall Side =	2,00	side	
Numbers of Drainage Holes =	14,00	pcs	
Volume =	798,00	m ³	
Total Volume =			1.197,00 m ³



L. Section M11			
Area =	56,30	m ²	
Length =	1,75	m'	
Volume =	98,53	m ³	
Total Volume =			98,53 m ³

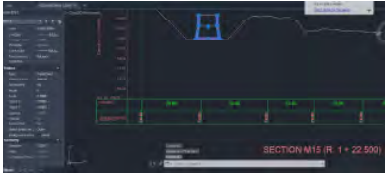
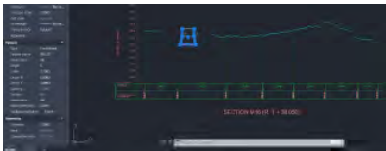
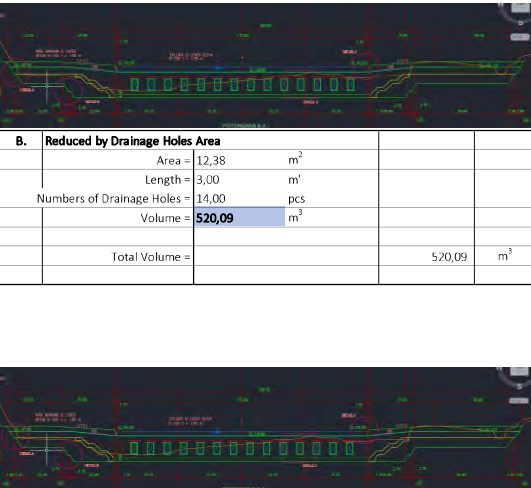


M. Section M12			
Area =	56,30	m ²	
Length =	19,00	m'	
Volume =	1069,71	m ³	
Total Volume =			1.069,71 m ³

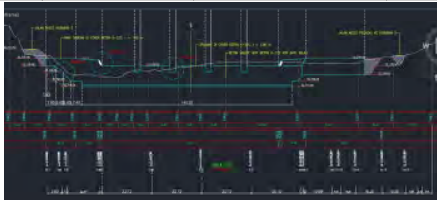
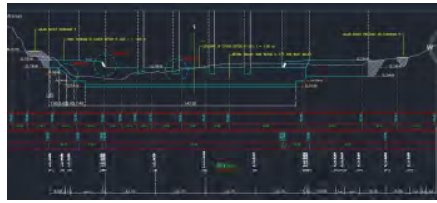
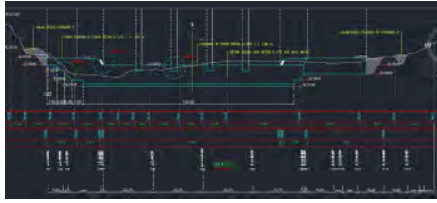

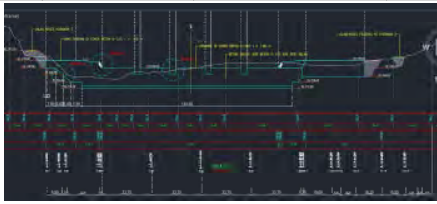



N. Section M13			
Area =	34,62	m ²	
Length =	5,80	m'	
Volume =	200,77	m ³	
Total Volume =			200,77 m ³



O. Section M14		Area = 34,62 m ²				
		Length = 50,00 m				
		Volume = 1730,80 m ³				
		Total Volume =		1.730,80	m ³	
						
P. Section M15		Area = 34,62 m ²				
		Length = 0,00 m				
		Volume = 0,00 m ³				
		Total Volume =		-	m ³	
						
Q. Section M16		Area = 34,62 m ²				
		Length = 26,09 m				
		Volume = 903,01 m ³				
		Total Volume =		903,01	m ³	
						
B. Reduced by Drainage Holes Area		Area = 12,38 m ²				
		Length = 3,00 m				
		Numbers of Drainage Holes = 14,00 pcs				
		Volume = 520,09 m ³				
		Total Volume =		520,09	m ³	
						
		Concrete K-350 Total Volume =		32.746,75	m³	

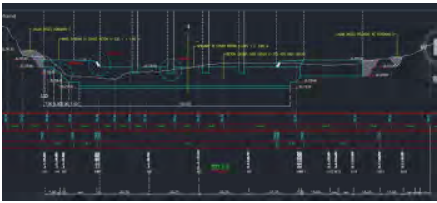
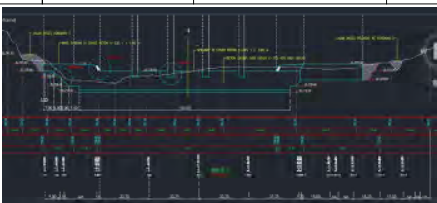
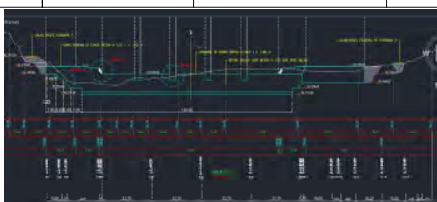
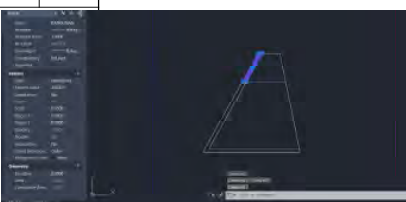
Name Structure : CD Kobokan 5
 Type of work : Concrete K-225 (Sub Dam)


No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Section M1				
	Area =	0,00 m ²			
	Length =	8,20 m'			
	Volume =	0,00 m ³			
	Total Volume =		-	m ³	
					
B.	Section M2				
	Area =	0,00 m ²			
	Length =	8,55 m'			
	Volume =	0,00 m ³			
	Total Volume =		-	m ³	
					
C.	Section M3				
	Area =	3,75 m ²			
	Length =	1,25 m'			
	Volume =	4,69 m ³			
	Total Volume =		4,69	m ³	
 					
D.	Section M4				
	Area =	10,71 m ²			
	Length =	2,70 m'			
	Volume =	28,91 m ³			
	Total Volume =		28,91	m ³	
 					

E. Section M5	Area = 16,36 m ²				
	Length = 3,10 m'				
	Volume = 50,70 m ³				
	Total Volume =		50,70	m ³	
F. Section M6	Area = 16,36 m ²				
	Length = 22,00 m'				
	Volume = 359,82 m ³				
	Total Volume =		359,82	m ³	
G. Section M7	Area = 14,36 m ²				
	Length = 1,75 m'				
	Volume = 25,13 m ³				
	Total Volume =		25,13	m ³	
H. Section M8	Area = 15,67 m ²				
	Length = 33,75 m'				
	Volume = 528,81 m ³				
	Total Volume =		528,81	m ³	

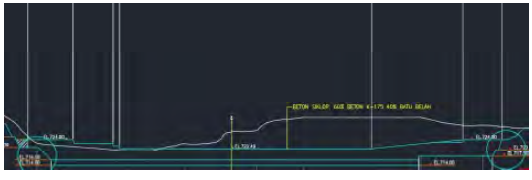


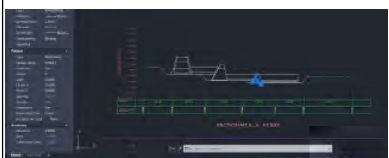

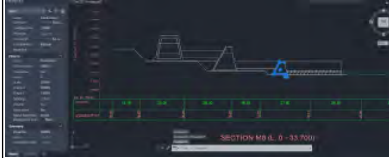

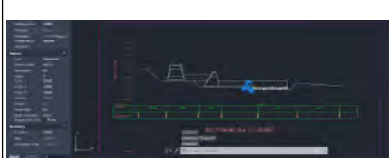
I. Section MC	Area = 15,67 m ²				
	Length = 33,75 m'				
	Volume = 528,81 m ³				
	Total Volume =		528,81	m ³	
J. Section M9	Area = 15,67 m ²				
	Length = 33,75 m'				
	Volume = 528,81 m ³				
	Total Volume =		528,81	m ³	
K. Section M10	Area = 14,36 m ²				
	Length = 33,75 m'				
	Volume = 484,64 m ³				
	Total Volume =		484,64	m ³	
L. Section M11	Area = 16,36 m ²				
	Length = 1,75 m'				
	Volume = 28,62 m ³				
	Total Volume =		28,62	m ³	

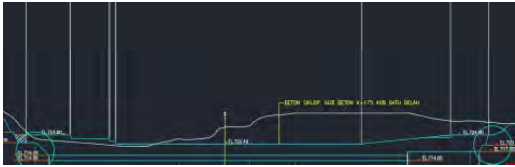





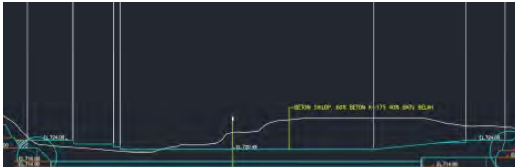

M. Section M12	Area = 16,36 m ²				
	Length = 19,00 m'				
	Volume = 310,75 m ³				
	Total Volume =		310,75	m ³	
N. Section M13	Area = 10,71 m ²				
	Length = 5,80 m'				
	Volume = 62,11 m ³				
	Total Volume =		62,11	m ³	
O. Section M14	Area = 3,21 m ²				
	Length = 50,00 m'				
	Volume = 160,62 m ³				
	Total Volume =		160,62	m ³	
P. Section M15	Area = 0,00 m ²				
	Length = 0,00 m'				
	Volume = 0,00 m ³				
	Total Volume =		-	m ³	

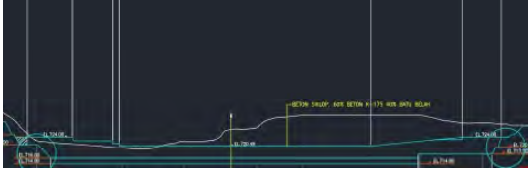

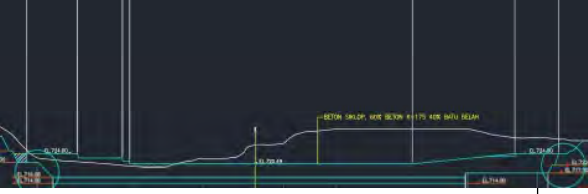
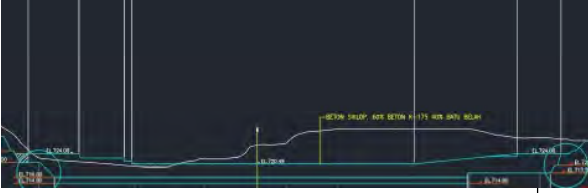
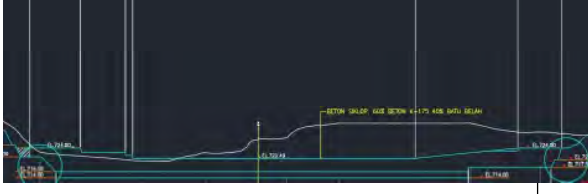
Q. Section M16	Area = 0,00 m ²				
	Length = 8,20 m'				
	Volume = 0,00 m ³				
	Total Volume =			-	m ³
					
R. Section Sisa	Area = 0,00 m ²				
	Length = 6,31 m'				
	Volume = 0,00 m ³				
	Total Volume =			-	m ³
					
S. Reduced by Drainage Holes Area	Area = 2,28 m ²				
	Length = 4,00 m'				
	Numbers of Drainage Holes = 4,00 buah				
	Volume = 36,52 m ³				
	Total Volume =			36,52	m ³
					
					
Concrete K-225 Sub Total Volume =				3.065,89	m³

Name Structure :		: CD Kobokan 5			
Type of work		: Concrete K-225 (Sub-Sub Dam)			
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Section M1	Area = 0,00 m ²			
		Length = 8,20 m'			
		Volume = 0,00 m ³			
	Total Volume =			-	m ²
					

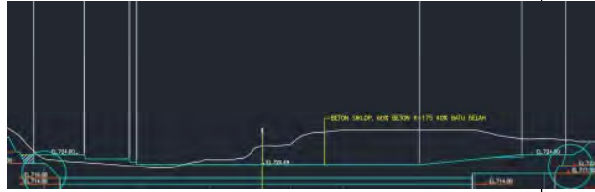
B. Section M2		Area = 0,00 m ²			
		Length = 8,55 m'			
		Volume = 0,00 m ³			
	Total Volume =			-	m ³
C. Section M3		Area = 0,00 m ²			
		Length = 18,25 m'			
		Volume = 0,00 m ³			
	Total Volume =			-	m ³
D. Section M4		Area = 2,75 m ²			
		Length = 3,60 m'			
		Volume = 9,90 m ³			
	Total Volume =			9,90	m ³
E. Section M5		Area = 12,58 m ²			
		Length = 3,10 m'			
		Volume = 39,01 m ³			
	Total Volume =			39,01	m ³

F. Section M6	Area = 12,58 m ²			
	Length = 22,00 m'			
	Volume = 276,82 m ³			
	Total Volume =		276,82	m ³
 				
G. Section M7	Area = 11,09 m ²			
	Length = 1,75 m'			
	Volume = 19,40 m ³			
	Total Volume =		19,40	m ³
 				
H. Section M8	Area = 12,39 m ²			
	Length = 33,75 m'			
	Volume = 418,30 m ³			
	Total Volume =		418,30	m ³
 				
I. Section MC	Area = 12,39 m ²			
	Length = 33,75 m'			
	Volume = 418,30 m ³			
	Total Volume =		418,30	m ³
 				

J. Section M9	Area =	12,39	m ²		
	Length =	33,75	m'		
	Volume =	418,30	m ³		
	Total Volume =			418,30	m ³
 					
K. Section M10	Area =	11,09	m ²		
	Length =	33,75	m'		
	Volume =	374,16	m ³		
	Total Volume =			374,16	m ³
 					
L. Section M11	Area =	12,58	m ²		
	Length =	1,75	m'		
	Volume =	22,02	m ³		
	Total Volume =			22,02	m ³
 					
M. Section M12	Area =	12,58	m ²		
	Length =	19,00	m'		
	Volume =	239,07	m ³		
	Total Volume =			239,07	m ³
 					

N. Section M13	Area =	2,75	m ²		
	Length =	5,80	m'		
	Volume =	15,95	m ³		
	Total Volume =			15,95	m ³
	 				
O. Section M14	Area =	0,00	m ²		
	Length =	50,00	m'		
	Volume =	0,00	m ³		
	Total Volume =			-	m ³
					
P. Section M15	Area =	0,00	m ²		
	Length =	0,00	m'		
	Volume =	0,00	m ³		
	Total Volume =			-	m ³
					
Q. Section M16	Area =	0,00	m ²		
	Length =	8,20	m'		
	Volume =	0,00	m ³		
	Total Volume =			-	m ³
					

R. Section Remainder	Area = 0,00	m ²			
	Length = 6,31	m'			
	Volume = 0,00	m ³			
	Total Volume =				m ³



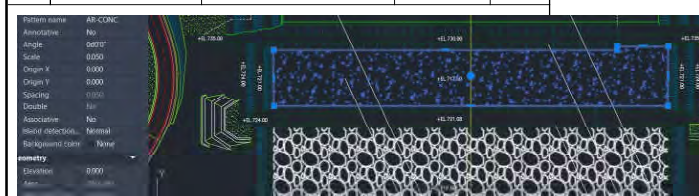
Concrete K-225 Sub Total Volume = 2.251,22 m³

Name Structure : : CD Kobokan 5
Type of work : Concrete K-225 (Apron)

No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Maindam Slab Apron				
	Area = 2718,06	m ²			
	Length = 2,00	m'			
	Volume = 5436,13	m ³			
	Total Volume =		5.436,13	m ²	




B	Floor Apron Maindam				
	Area = 3036,38	m ²			
	Thickness = 2,00	m'			
	Volume = 6072,76	m ³			
	Total Volume =		6.072,76	m ²	

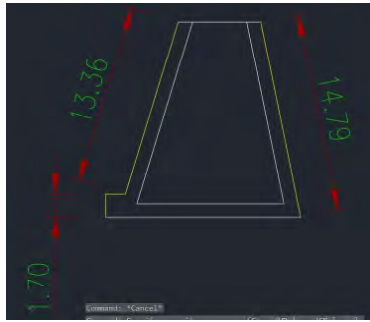
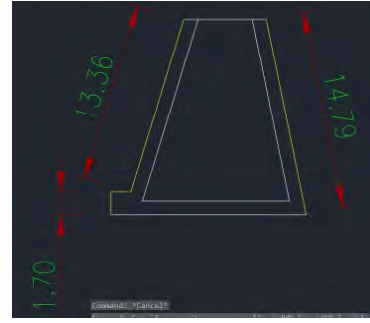
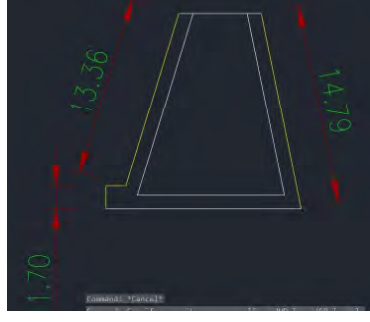
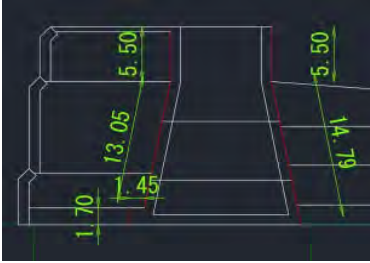


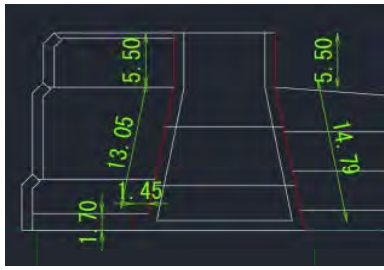



	Concrete K-225 Sub Total Volume = 11.508,89 m³
	Concrete K-225 Total Volume = 16.826,00 m³

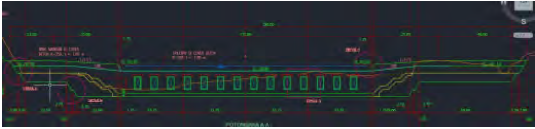
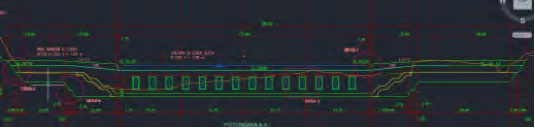


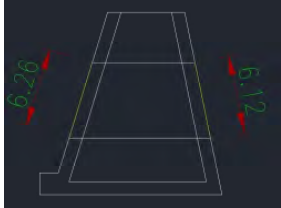

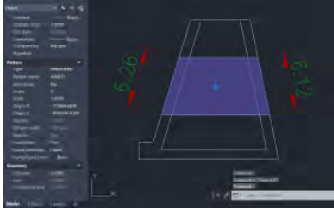
Name Structure : CD Kobokan 5
 Type of work : Exposed Formwork (Maidam)

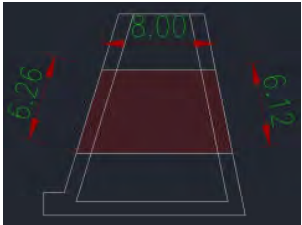

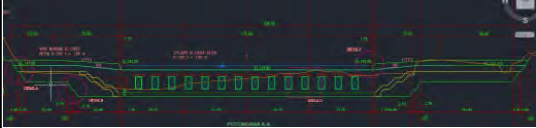
No.	Description	Calculation	Volume	Unit	Drawing Reference
A. Section M1					
	Formwork Length =	24,26 m'			
	Length =	8,20 m'			
	Volume =	198,93 m ²			
	Total Volume =		198,93	m ²	
					
B. Section M2					
	Formwork Length =	24,26 m'			
	Length =	0,00 m'			
	Volume =	0,00 m ²			
	Total Volume =			m ²	
					
C. Section M3					
	Formwork Length =	24,26 m'			
	Length =	22,50 m'			
	Volume =	545,85 m ²			
	Total Volume =		545,85	m ²	
					
D. Section M4					
	Formwork Length =	24,26 m'			
	Length =	2,70 m'			
	Volume =	65,50 m ²			
	Total Volume =		65,50	m ²	
					

E. Section M5	Formwork Length = 41,99	m'			
	Length = 3,10	m'			
	Volume = 130,17	m ²			
	Total Volume =			130,17	m ²
F. Section M6	Formwork Length = 41,99	m'			
	Length = 22,00	m'			
	Volume = 923,78	m ²			
	Total Volume =			923,78	m ²
G. Section M7	Formwork Length = 30,99	m'			
	Length = 1,75	m'			
	Volume = 54,23	m ²			
	Total Volume =			54,23	m ²
H. Section M8	Formwork Length = 29,85	m'			
	Length = 33,75	m'			
	Volume = 1007,44	m ²			
	Total Volume =			1.007,44	m ²


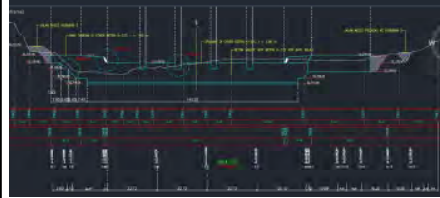
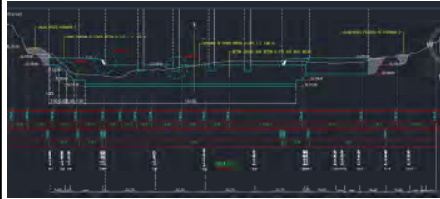

I. Section MC	Formwork Length = 29,85	m'			
	Length = 33,75	m'			
	Volume = 1007,44	m ²			
	Total Volume =		1.007,44	m ²	
					
J. Section M9	Formwork Length = 29,85	m'			
	Length = 33,75	m'			
	Volume = 1007,44	m ²			
	Total Volume =		1.007,44	m ²	
					
K. Section M10	Formwork Length = 29,85	m'			
	Length = 33,75	m'			
	Volume = 1007,44	m ²			
	Total Volume =		1.007,44	m ²	
					
L. Section M11	Formwork Length = 41,99	m'			
	Length = 1,75	m'			
	Volume = 73,48	m ²			
	Total Volume =		73,48	m ²	
					

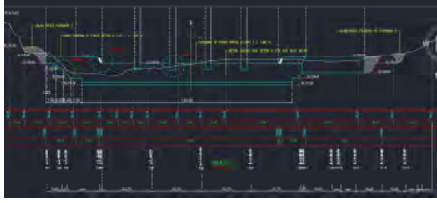
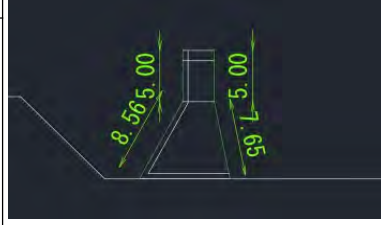
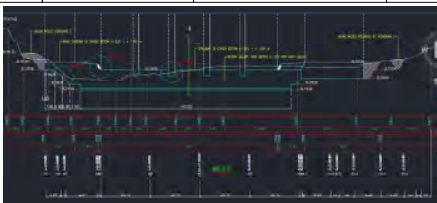
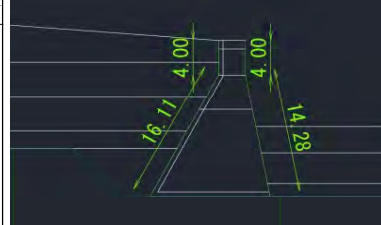
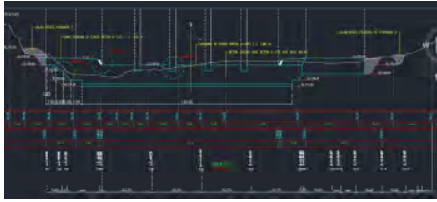
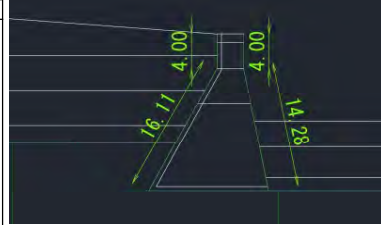
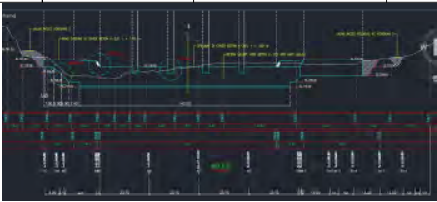

M. Section M12	Formwork Length = 41,99 m'				
	Length = 19,00 m'				
	Volume = 797,81 m ²				
	Total Volume =		797,81	m ²	
					
N. Section M13	Formwork Length = 24,26 m'				
	Length = 5,80 m'				
	Volume = 140,71 m ²				
	Total Volume =		140,71	m ²	
					
O. Section M14	Formwork Length = 24,26 m'				
	Length = 50,00 m'				
	Volume = 1213,00 m ²				
	Total Volume =		1.213,00	m ²	
					
P. Section M15	Formwork Length = 24,26 m'				
	Length = 0,00 m'				
	Volume = 0,00 m ²				
	Total Volume =		-	m ²	
					



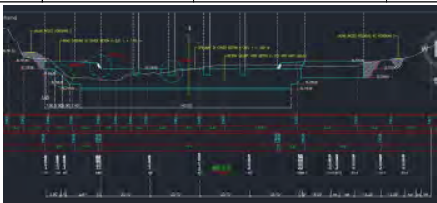
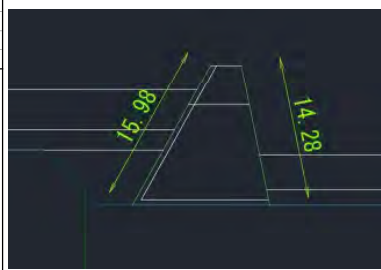
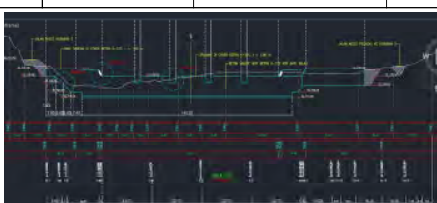
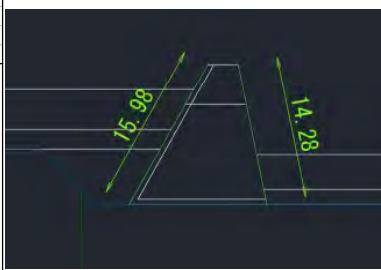

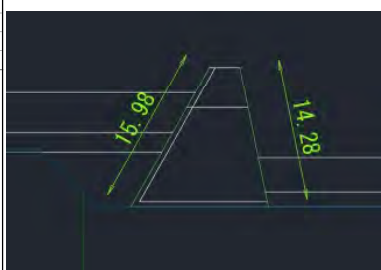
Q. Section M16	Formwork Length = 24,26	m'			
	Length = 8,20	m'			
	Volume = 198,93	m ²			
	Total Volume =			198,93	m ²
					
R. Section Remainder	Formwork Length = 0,00	m'			
	Length = 6,31	m'			
	Volume = 0,00	m ²			
	Total Volume =			-	m ²
					
S. Reduced by Drainage Holes Area	Formwork Length = 12,38	m'			
	Drainage Hole Width = 3,00	m'			
	Numbers of Drainage Holes = 14,00	buah			
	Volume = 519,96	m ²			
	Total Volume =			519,96	m ²
					
S. Plus Wall Conduit drainage hole	Formwork Area = 57,00	m ²			
	Numbers of Drainage Holes Side = 2,00	Side			
	Numbers of Drainage Holes = 14,00	pcs			
	Volume = 1596,00	m ²			
	Total Volume =			1.596,00	m ²
					
					
					
					

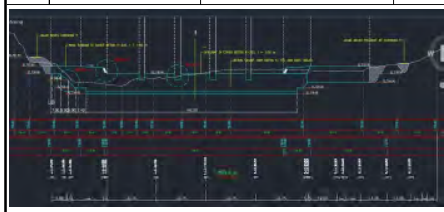
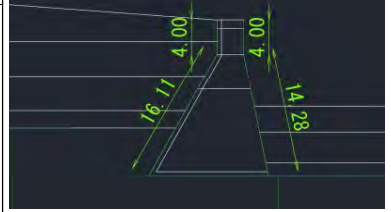
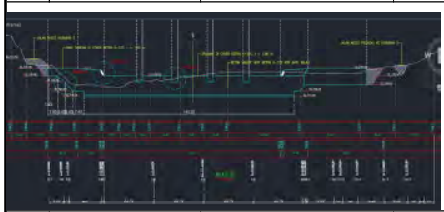

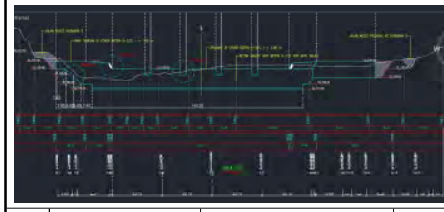

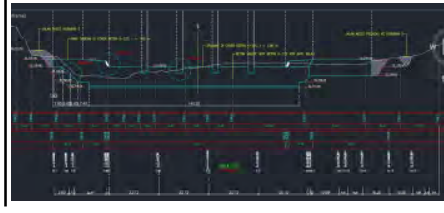

S. Plus Top Side Conduit drainage hole					
Top Side Conduit Length =	8,00	m'			
Drainage Holes Width =	3,00	m			
Numbers of Drainage Holes =	14,00	pcs			
Volume =	336,00	m ²			
Total Volume =			336,00	m ²	
					
					
					
Exposed Formwork Sub Total Volume =			9,784,19 m²		


Name Structure : CD Kobokan 5
Type of work : Exposed Formwork (Subdam)

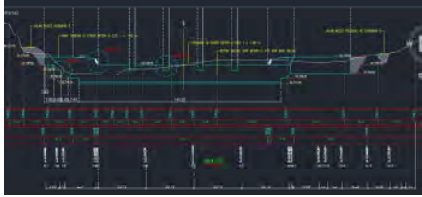

No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Section M1				
	Formwork Length =	0,00	m ²		
	Length =	8,20	m'		
	Volume =	0,00	m ³		
	Total Volume =			-	m ²
					
B.	Section M2				
	Formwork Length =	0,00	m ²		
	Length =	8,55	m'		
	Volume =	0,00	m ³		
	Total Volume =			-	m ²
					
C.	Section M3				
	Formwork Length =	10,00	m'		
	Length =	1,25	m'		
	Volume =	12,50	m ²		
	Total Volume =			12,50	m ²
					
					

D. Section M4	Formwork Length = 26,21 m ²				
	Length = 2,70 m'				
	Volume = 70,77 m ³				
	Total Volume =		70,77	m2	
 					
E. Section M5	Formwork Length = 38,39 m'				
	Length = 3,10 m'				
	Volume = 119,01 m ³				
	Total Volume =		119,01	m2	
 					
F. Section M6	Formwork Length = 38,39 m'				
	Length = 22,00 m'				
	Volume = 844,58 m ³				
	Total Volume =		844,58	m2	
 					
G. Section M7	Formwork Length = 30,26 m'				
	Length = 1,75 m'				
	Volume = 52,96 m ³				
	Total Volume =		52,96	m2	
 					

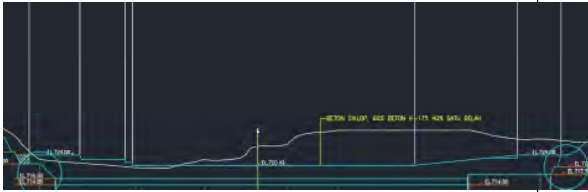

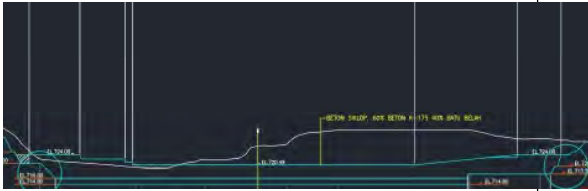
H. Section M8	Formwork Length = 30,26 m'				
	Length = 33,75 m'				
	Volume = 1021,28 m ²				
	Total Volume =		1.021,28	m2	
 					
I. Section MC	Formwork Length = 30,26 m'				
	Length = 33,75 m'				
	Volume = 1021,28 m ²				
	Total Volume =		1.021,28	m2	
 					
J. Section M9	Formwork Length = 30,26 m'				
	Length = 33,75 m'				
	Volume = 1021,28 m ²				
	Total Volume =		1.021,28	m2	
 					
K. Section M10	Formwork Length = 30,26 m'				
	Length = 33,75 m'				
	Volume = 1021,28 m ²				
	Total Volume =		1.021,28	m2	
 					

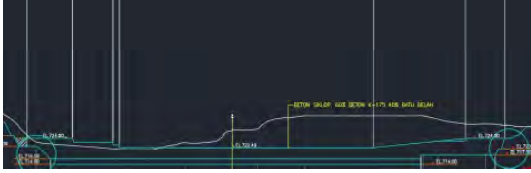


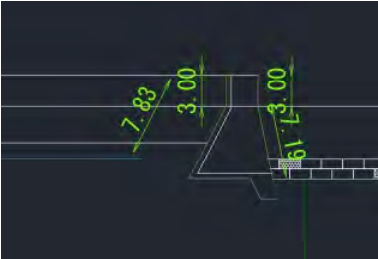
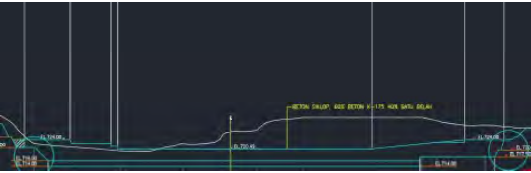
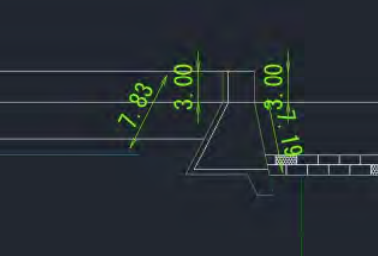
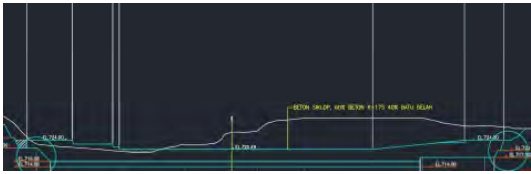
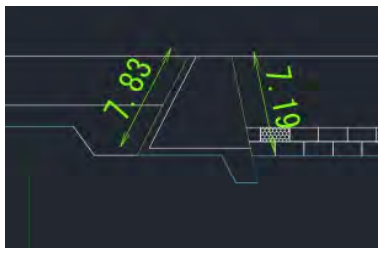
L.	Section M11 Formwork Length = 38,39 m' Length = 1,75 m' Volume = 67,18 m ²			
		Total Volume = 67,18 m2		
M.	Section M12 Formwork Length = 38,39 m' Length = 19,00 m' Volume = 729,41 m ²			
		Total Volume = 729,41 m2		
N.	Section M13 Formwork Length = 26,21 m' Length = 5,80 m' Volume = 152,02 m ²			
		Total Volume = 152,02 m2		
O.	Section M14 Formwork Length = 18,18 m' Length = 50,00 m' Volume = 909,00 m ²			
		Total Volume = 909,00 m2		

P. Section M15	Formwork Length = 0,00	m'			
	Length = 0,00	m'			
	Volume = 0,00	m ²			
	Total Volume =		-		m2
					
Q. Section M16	Formwork Length = 0,00	m'			
	Length = 8,20	m'			
	Volume = 0,00	m ²			
	Total Volume =		-		m2
					
R. Section Remainder	Formwork Length = 0,00	m'			
	Length = 6,31	m'			
	Volume = 0,00	m ²			
	Total Volume =		-		m2
					
S. Reduced by Drainage Hole Area	Formwork Length = 8,65	m'			
	Drainage Hole Width = 4,00	m'			
	Numbers of Drainage Holes = 4,00	pcs			
	Volume = 138,40	m ²			
	Total Volume =		138,40		m ²
					
					

S. Plus Wall Conduit drainage hole				
Formwork Area =	18,00	m ²		
Numbers of Drainage Holes Side =	2,00	Side		
Numbers of Drainage Holes =	4,00	pcs		
Volume =	144,00	m ²		
Total Volume =			144,00	m ²
				
Exposed Formwork Sub Total Volume =		7.048,12 m²		

Name Structure : CD Kobokan 5
Type of work : Exposed Formwork (Sub-Subdam)

No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Section M1				
	Formwork Length =	0,00	m'		
	Length =	8,20	m'		
	Volume =	0,00	m ²		
	Total Volume =			-	m ²
					
B.	Section M2				
	Formwork Length =	0,00	m'		
	Length =	8,55	m'		
	Volume =	0,00	m ²		
	Total Volume =			-	m ²
					
C.	Section M3				
	Formwork Length =	0,00	m'		
	Length =	18,25	m'		
	Volume =	0,00	m ²		
	Total Volume =			-	m ²
					

D. Section M4	Formwork Length = 6,00 m'			
	Length = 3,60 m'			
	Volume = 21,60 m ²			
	Total Volume =		21,60	m ²
 				
E. Section M5	Formwork Length = 21,02 m'			
	Length = 3,10 m'			
	Volume = 65,16 m ²			
	Total Volume =		65,16	m ²
 				
F. Section M6	Formwork Length = 21,02 m'			
	Length = 22,00 m'			
	Volume = 462,44 m ²			
	Total Volume =		462,44	m ²
 				
G. Section M7	Formwork Length = 15,02 m'			
	Length = 1,75 m'			
	Volume = 26,29 m ²			
	Total Volume =		26,29	m ²
 				

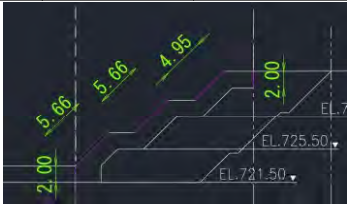
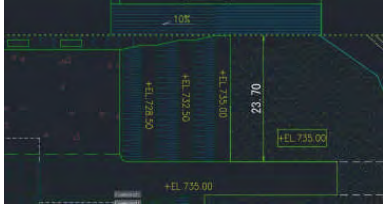
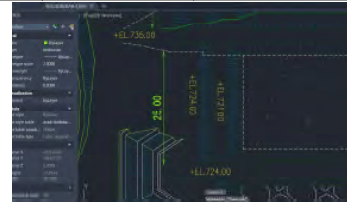

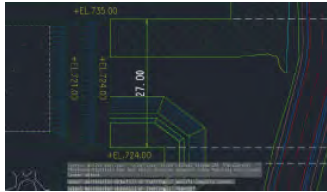


H. Section M8	Formwork Length =	15,02	m'		
	Length =	33,75	m'		
	Volume =	506,93	m ²		
	Total Volume =			506,93	m ²
I. Section MC	Formwork Length =	15,02	m'		
	Length =	33,75	m'		
	Volume =	506,93	m ²		
	Total Volume =			506,93	m ²
J. Section M9	Formwork Length =	15,02	m'		
	Length =	33,75	m'		
	Volume =	506,93	m ²		
	Total Volume =			506,93	m ²
K. Section M10	Formwork Length =	15,02	m'		
	Length =	33,75	m'		
	Volume =	506,93	m ²		
	Total Volume =			506,93	m ²

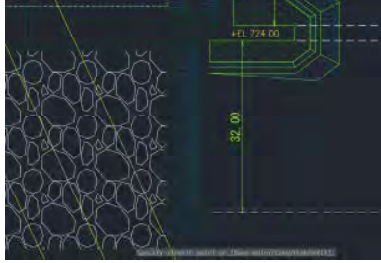
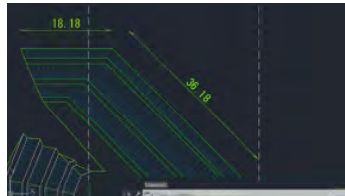
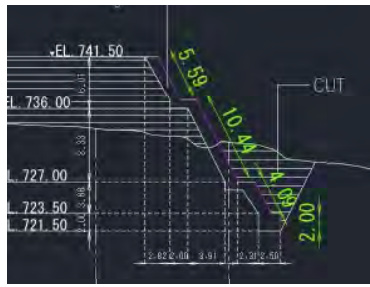
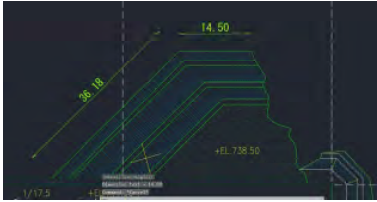

L. Section M11	Formwork Length = 21,02 m'				
	Length = 1,75 m'				
	Volume = 36,79 m ²				
	Total Volume =			36,79	m ²
M. Section M12	Formwork Length = 21,02 m'				
	Length = 19,00 m'				
	Volume = 399,38 m ²				
	Total Volume =			399,38	m ²
N. Section M13	Formwork Length = 6,00 m'				
	Length = 5,80 m'				
	Volume = 34,80 m ²				
	Total Volume =			34,80	m ²
O. Section M14	Formwork Length = 0,00 m'				
	Length = 50,00 m'				
	Volume = 0,00 m ²				
	Total Volume =			-	m ²

P. Section M15	Formwork Length = 0,00	m'			
	Length = 0,00	m'			
	Volume = 0,00	m ²			
	Total Volume =				m ²
Q. Section M16	Formwork Length = 0,00	m'			
	Length = 8,20	m'			
	Volume = 0,00	m ²			
	Total Volume =				m ²
R. Section Remainder	Formwork Length = 0,00	m'			
	Length = 6,31	m'			
	Volume = 0,00	m ²			
	Total Volume =				m ²
Exposed Formwork Sub Total Volume =					3,074,15 m²

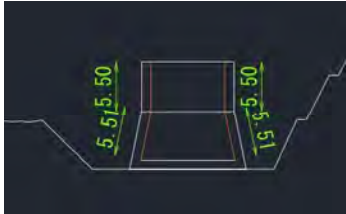

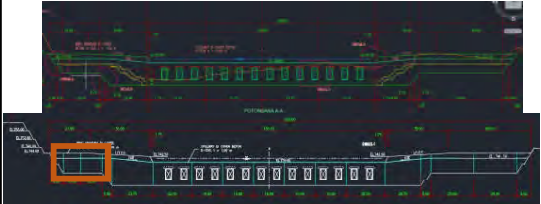
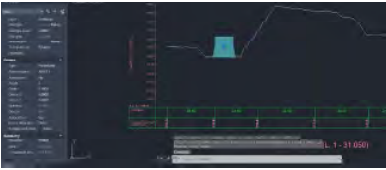

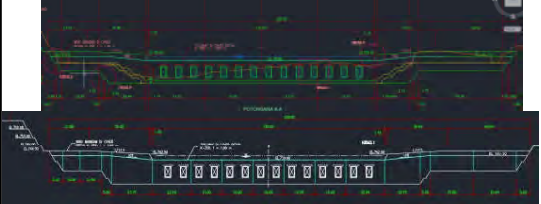
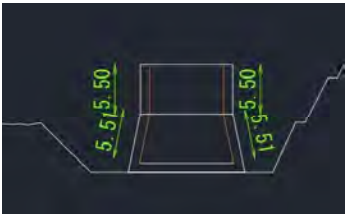

Name Structure : CD Kobokan 5
Type of work : Exposed Formwork (Retaining Wall Apron)

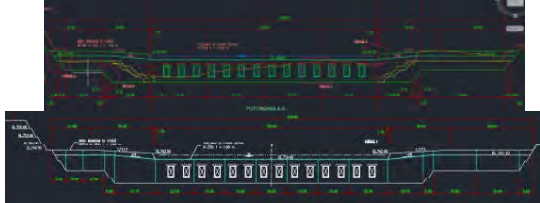

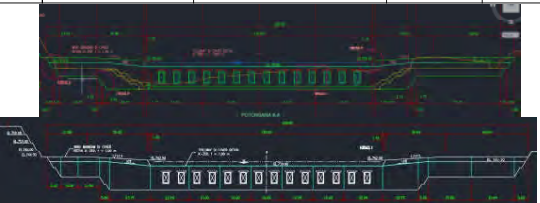
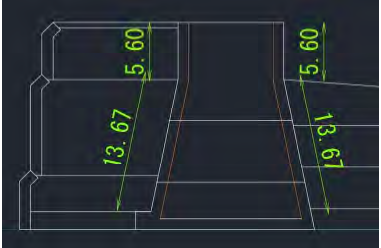

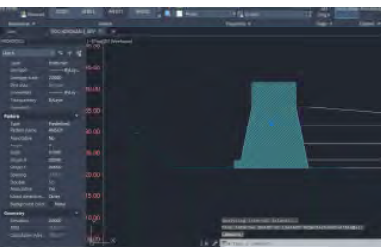

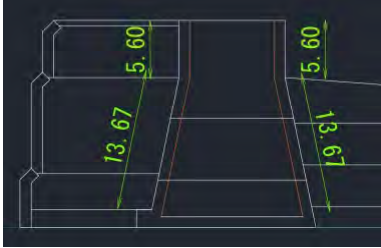
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Apron Right Side Wall Maindam				
	Formwork Length = 20,27	m'			
	Length = 27,00	m'			
	Volume = 547,29	m ²			
	Total Volume =		547,29	m ²	


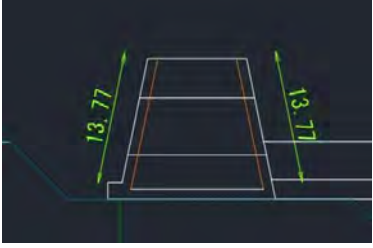


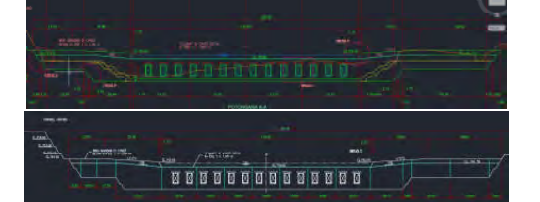
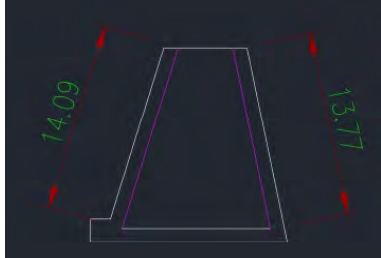

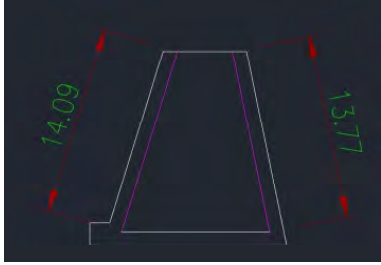
B. Apron Left Side Wall Maindam					
Formwork Length =	20,27	m'			
Length =	23,70	m'			
Volume =	480,40	m ²			
Total Volume =			480,40	m ²	
					
C. Apron Right Side Wall Subdam					
Formwork Length =	13,19	m'			
Length =	25,00	m'			
Volume =	329,75	m ²			
Total Volume =			329,75	m ²	
					
D. Apron Left Side Wall Subdam					
Formwork Length =	13,19	m'			
Length =	27,00	m'			
Volume =	356,13	m ²			
Total Volume =			356,13	m ²	
					
E. Apron Right Side Wall Sub-Subdam					
Formwork Length =	10,71	m'			
Length =	32,00	m'			
Volume =	342,72	m ²			
Total Volume =			342,72	m ²	
					


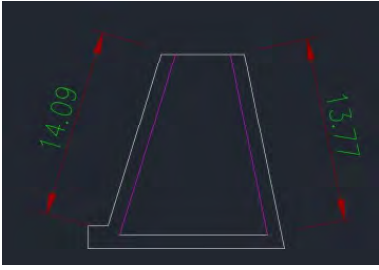
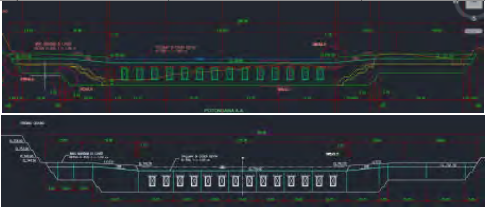
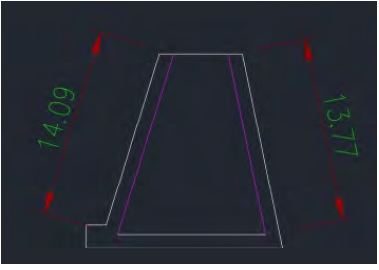

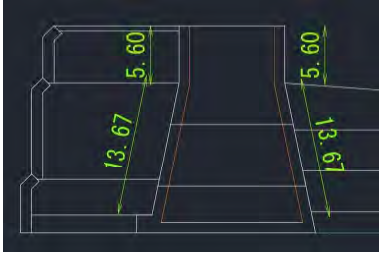

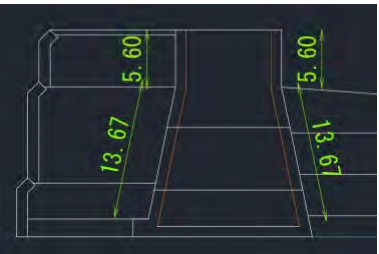
F. Apron Left Side Wall Sub-Dam	Formwork Length = 10,71 m'					
	Length = 32,00 m'					
	Volume = 342,72 m ²					
	Total Volume =			342,72	m ²	
						
G. Right Side Wall Bufferfill	Formwork Length = 22,12 m'					
	Length = 54,36 m'					
	Volume = 1202,44 m ²					
	Total Volume =			1.202,44	m ²	
 						
H. Left Side Wall Bufferfill	Formwork Length = 22,12 m'					
	Length = 50,68 m'					
	Volume = 1121,04 m ²					
	Total Volume =			1.121,04	m ²	
						
H. Right Side Protection Wall	Formwork Length = 16,85 m'					
	Length = 88,78 m'					
	Volume = 1495,94 m ²					
	Total Volume =			1.495,94	m ²	
						
Exposed Formwork Sub Total Volume =					6.218,44	m ²
Exposed Formwork Total Volume =					26.124,90	m ²


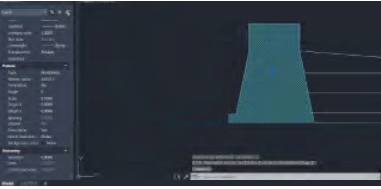

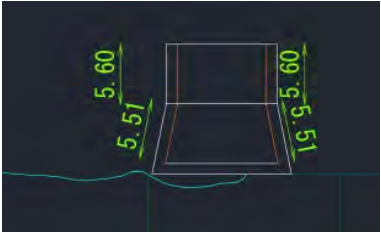

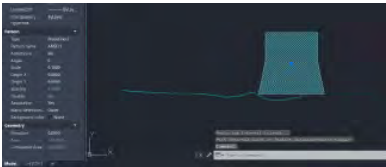
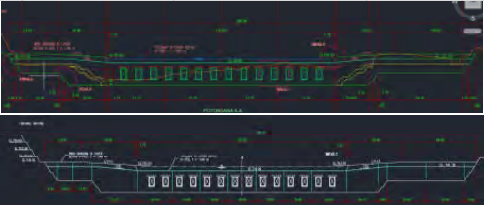
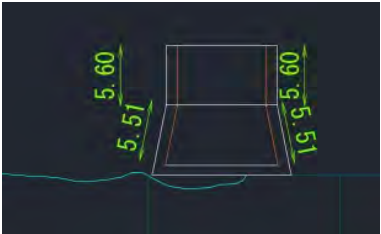
Name Structure : CD Kobokan 5
 Type of work : Non Exposed Formwork (Maindam)


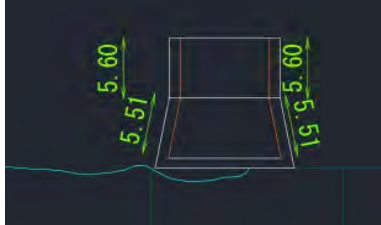
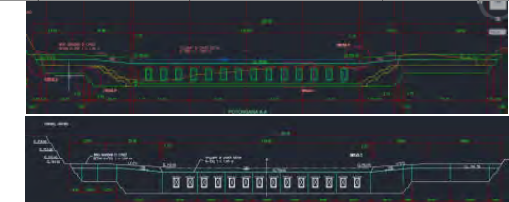
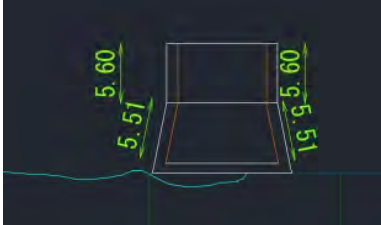
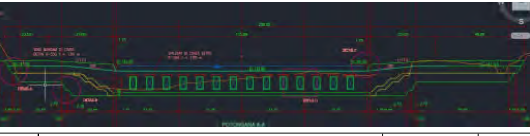
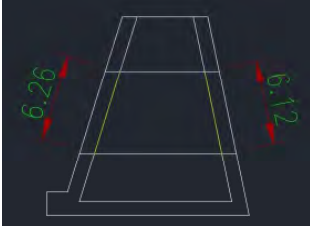

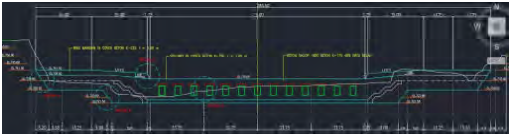
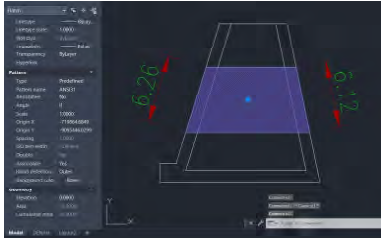
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Section M1				
	Formwork Length =	22,02 m'			
	Length =	8,20 m'			
	Volume =	180,56 m ²			
	Total Volume =		180,56	m ²	
					
B.	Section M1 Joint				 
	Formwork area	128,45 m ²			
	Numbers of Formwork =	3,00 pcs Ka-Ki			
	Volume =	385,35 m ²			
	Total Volume =		385,35	m ²	
B.	Section M2				
	Formwork Length =	22,02 m'			
	Length =	0,00 m'			
	Volume =	0,00 m ²			
	Total Volume =		-	m ²	
					
C.	Section M3				
	Formwork Length =	22,02 m'			
	Length =	22,50 m'			
	Volume =	495,45 m ²			
	Total Volume =		495,45	m ²	
					

D. Section M4	Formwork Length =	22,02	m'			
	Length =	2,70	m'			
	Volume =	59,45	m ²			
	Total Volume =				59,45	m ²
 						
E. Section M5	Formwork Length =	38,54	m'			
	Length =	3,10	m'			
	Volume =	119,47	m ²			
	Total Volume =				119,47	m ²
 						
B Section M5 Joint	Formwork area	244,22	m ²			
	Numbers of Formwork =	1,00	Buah			
	Volume =	244,22	m ²			
	Total Volume =				244,22	m ²
 						
F. Section M6	Formwork Length =	38,54	m'			
	Length =	22,00	m'			
	Volume =	847,88	m ²			
	Total Volume =				847,88	m ²
 						

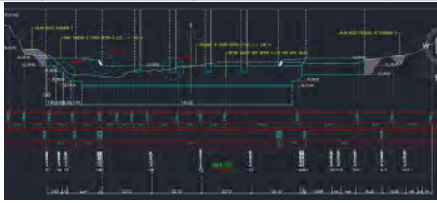
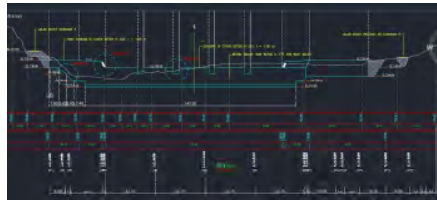
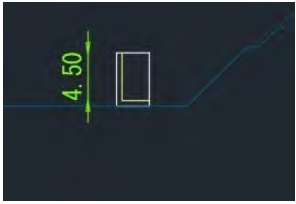
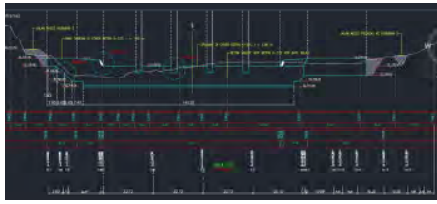

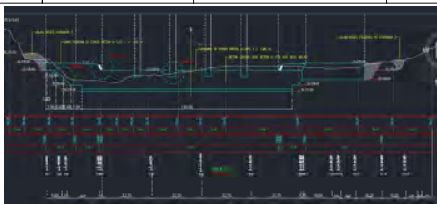
G. Section M7	Formwork Length = 27,54 m'				
	Length = 1,75 m'				
	Volume = 48,20 m ³				
	Total Volume =			48,20	m ³
 					
B Section M7 Joint	Formwork area 141,59 m ²				
	Numbers of Formwork = 8,00 pcs				
	Volume = 1132,69 m ³				
	Total Volume =			1.132,69	m ³
 					
H. Section M8	Formwork Length = 27,86 m'				
	Length = 33,75 m'				
	Volume = 940,28 m ³				
	Total Volume =			940,28	m ³
 					
I. Section MC	Formwork Length = 27,86 m'				
	Length = 33,75 m'				
	Volume = 940,28 m ³				
	Total Volume =			940,28	m ³
 					

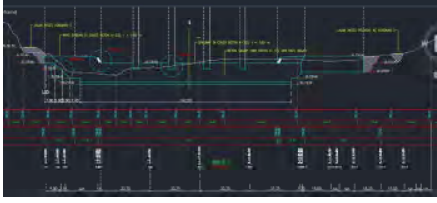

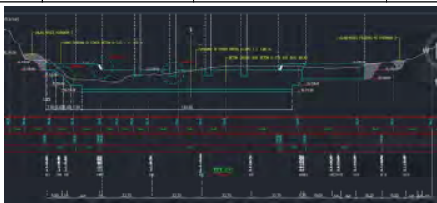

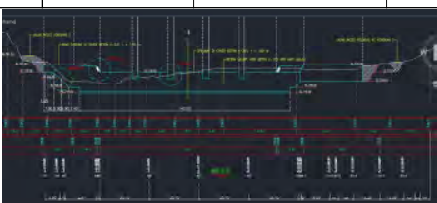


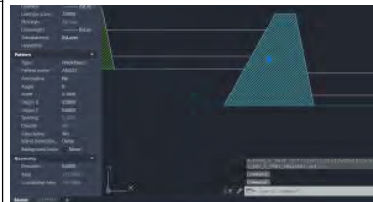
J. Section M9	Formwork Length = 27,86 m'				
	Length = 33,75 m'				
	Volume = 940,28 m ²				
	Total Volume =		940,28	m ²	
					
					
K. Section M10	Formwork Length = 27,86 m'				
	Length = 33,75 m'				
	Volume = 940,28 m ²				
	Total Volume =		940,28	m ²	
					
					
L. Section M11	Formwork Length = 38,54 m'				
	Length = 1,75 m'				
	Volume = 67,45 m ²				
	Total Volume =		67,45	m ²	
					
					
M. Section M12	Formwork Length = 38,54 m'				
	Length = 19,00 m'				
	Volume = 732,26 m ²				
	Total Volume =		732,26	m ²	
					
					


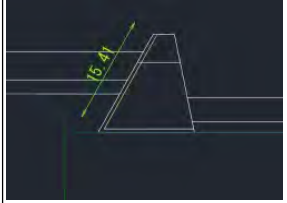
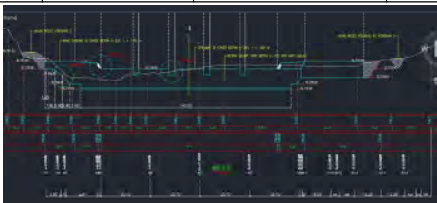
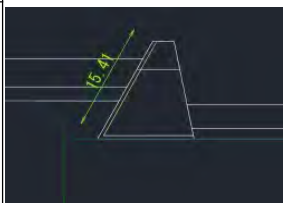
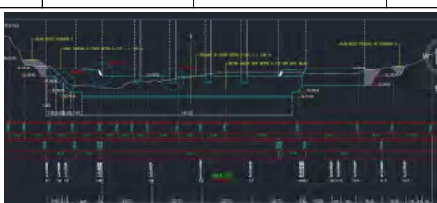



B	Section M12 Joint					
	Formwork area	244,22	m ²			
	Numbers of Formwork =	1,00	Buah			
	Volume =	244,22	m ²			
	Total Volume =			244,22	m ²	
						
N.	Section M13					
	Formwork Length =	22,22	m'			
	Length =	5,80	m'			
	Volume =	128,88	m ²			
	Total Volume =			128,88	m ²	
						
B	Section M13 Joint					
	Formwork area	128,45	m ²			
	Numbers of Formwork =	3,00	Buah			
	Volume =	385,35	m ²			
	Total Volume =			385,35	m ²	
						
O.	Section M14					
	Formwork Length =	22,22	m'			
	Length =	50,00	m'			
	Volume =	1111,00	m ²			
	Total Volume =			1.111,00	m ²	
						

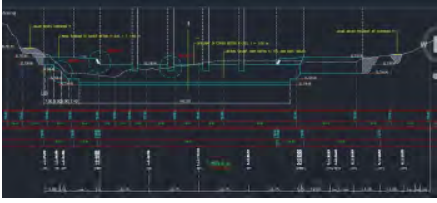
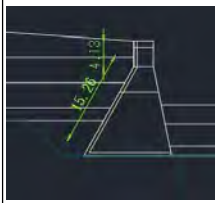
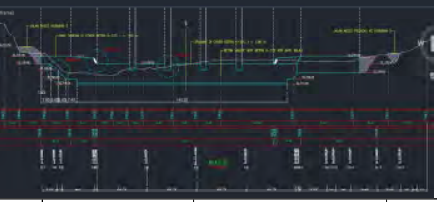

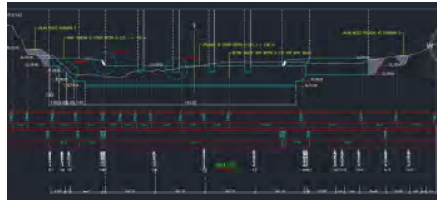
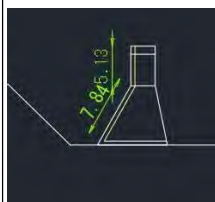
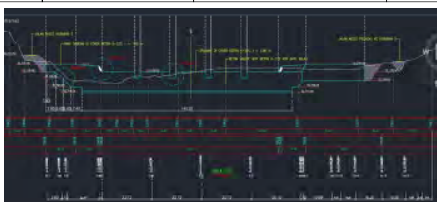
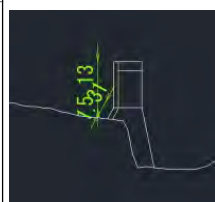
P. Section M15	Formwork Length = 22,22	m'			
	Length = 0,00	m'			
	Volume = 0,00	m ²			
	Total Volume =				m ²
 					
Q. Section M16	Formwork Length = 22,22	m'			
	Length = 8,20	m'			
	Volume = 182,20	m ²			
	Total Volume =			182,20	m ²
 					
S. Reduced by Drainage Holes Area	Formwork Length = 12,36	m'			
	Drainage Hole Width = 3,00	m'			
	Numbers of Drainage Holes = 14,00	pcs			
	Volume = 519,12	m ²			
	Total Volume =			519,12	m ²
  					
S. Plus Wall Conduit drainage hole	Formwork Area = 57,00	m ²			
	Numbers of Drainage Holes Side = 2,00	Side			
	Numbers of Drainage Holes = 14,00	pcs			
	Volume = 1596,00	m ²			
	Total Volume =			1.596,00	m ²
 					
Non Exposed Formwork Sub Total Volume = 11.202,60 m²					

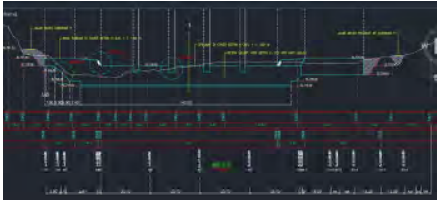
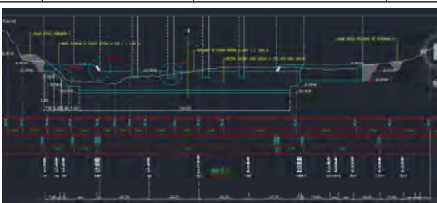
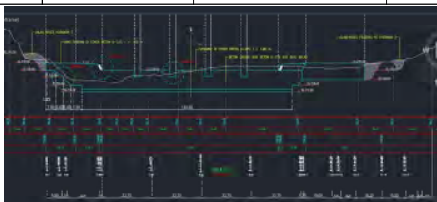
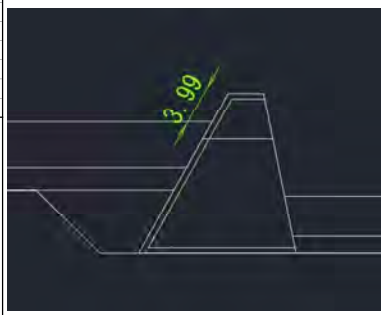
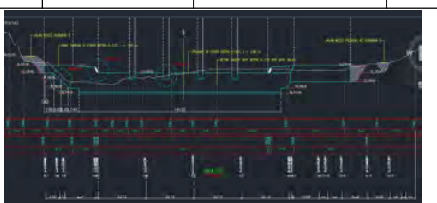
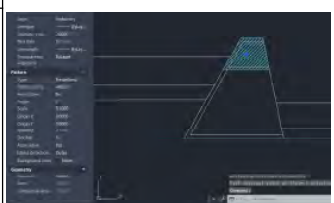
Name Structure : CD Kobokan 5
 Type of work : Non Exposed Formwork (Subdam)

No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Section M1				
	Formwork Length =	0,00 m ²			
	Length =	8,20 m'			
	Volume =	0,00 m ²			
	Total Volume =		-	m ²	
					
B.	Section M2				
	Formwork Length =	0,00 m ²			
	Length =	8,55 m'			
	Volume =	0,00 m ³			
	Total Volume =		-	m ³	
					
C.	Section M3				
	Formwork Length =	4,50 m'			
	Length =	1,25 m'			
	Volume =	5,63 m ²			
	Total Volume =		5,63	m ²	
					
D.	Section M4				
	Formwork Length =	12,97 m'			
	Length =	2,70 m'			
	Volume =	35,02 m ²			
	Total Volume =		35,02	m ²	
					

E. Section M5	Formwork Length = 19,39 m'				
	Length = 3,10 m'				
	Volume = 60,11 m ²				
	Total Volume =		60,11	m2	
					
F. Section M6	Formwork Length = 19,39 m'				
	Length = 22,00 m'				
	Volume = 426,58 m ²				
	Total Volume =		426,58	m2	
					
G. Section M7	Formwork Length = 15,41 m'				
	Length = 1,75 m'				
	Volume = 26,97 m ²				
	Total Volume =		26,97	m2	
					
G. Section M7 Joint	Formwork area 115,50 m2				
	Numbers of Formwork = 5,00 Buah				
	Volume = 577,50 m2				
	Total Volume =		577,50	m2	
					

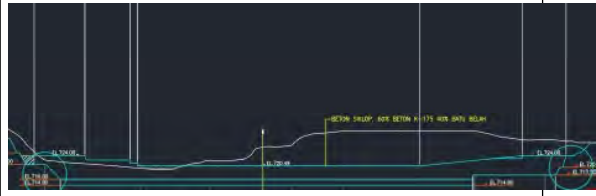
H. Section M8	Formwork Length = 15,41 m'				
	Length = 33,75 m'				
	Volume = 520,09 m ²				
	Total Volume =		520,09	m2	
					
I. Section MC	Formwork Length = 15,41 m'				
	Length = 33,75 m'				
	Volume = 520,09 m ²				
	Total Volume =		520,09	m2	
					
J. Section M9	Formwork Length = 15,41 m'				
	Length = 33,75 m'				
	Volume = 520,09 m ²				
	Total Volume =		520,09	m2	
					
K. Section M10	Formwork Length = 15,41 m'				
	Length = 33,75 m'				
	Volume = 520,09 m ²				
	Total Volume =		520,09	m2	
					

L. Section M11	Formwork Length = 19,39 m'				
	Length = 1,75 m'				
	Volume = 33,93 m ²				
	Total Volume =		33,93	m2	
 					
M. Section M12	Formwork Length = 19,39 m'				
	Length = 19,00 m'				
	Volume = 368,41 m ²				
	Total Volume =		368,41	m2	
 					
N. Section M13	Formwork Length = 12,97 m'				
	Length = 5,80 m'				
	Volume = 75,23 m ²				
	Total Volume =		75,23	m2	
 					
O. Section M14	Formwork Length = 6,44 m'				
	Length = 50,00 m'				
	Volume = 322,00 m ²				
	Total Volume =		322,00	m2	
 					

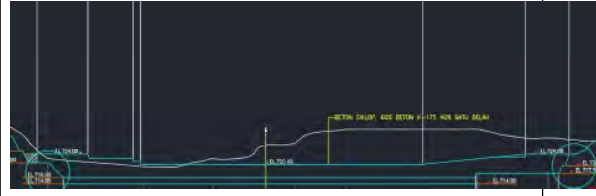
P. Section M15	Formwork Length = 0,00	m'				
	Length = 0,00	m'				
	Volume = 0,00	m ²				
	Total Volume =				-	m2
						
Q. Section M16	Formwork Length = 0,00	m'				
	Length = 8,20	m'				
	Volume = 0,00	m ²				
	Total Volume =				-	m2
						
S. Reduced by Drainage Holes Area	Formwork Length = 3,99	m'				
	Drainage Hole Width = 4,00	m'				
	Numbers of Drainage Holes = 4,00	buah				
	Volume = 63,84	m ²				
	Total Volume =				63,84	m ²
						
						
S. Plus Wall Conduit drainage hole	Formwork Area = 19,84	m2				
	Numbers of Drainage Holes Side = 2,00	Sisi				
	Numbers of Drainage Holes = 4,00	buah				
	Volume = 158,72	m ²				
	Total Volume =				158,72	m ²
						
						
Non Exposed Formwork Sub Total Volume = 4.106,60 m³						

Name Structure : CD Kobokan 5
 Type of work : Non Exposed Formwork (Sub-Subdam)

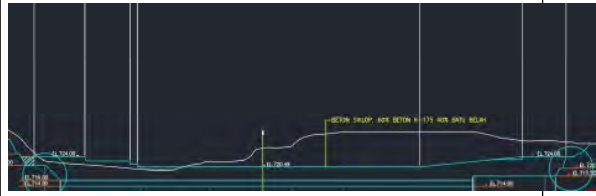
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Section M1				
	Formwork Length =	0,00 m'			
	Length =	8,20 m'			
	Volume =	0,00 m ²			
	Total Volume =		-	m ²	



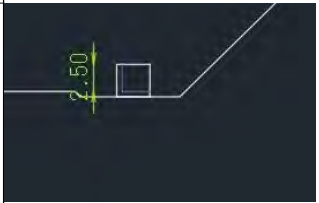
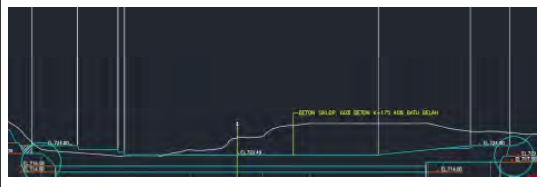
B.	Section M2				
	Formwork Length =	0,00 m'			
	Length =	8,55 m'			
	Volume =	0,00 m ²			
	Total Volume =		-	m ²	

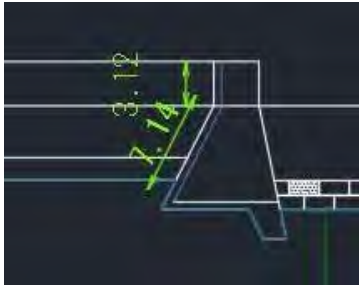
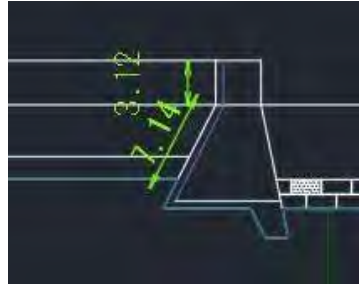
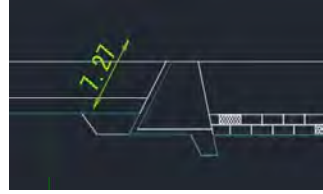
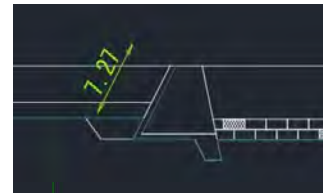


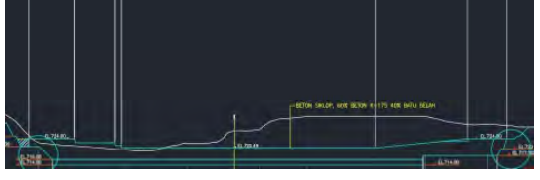


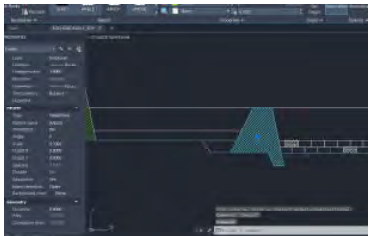
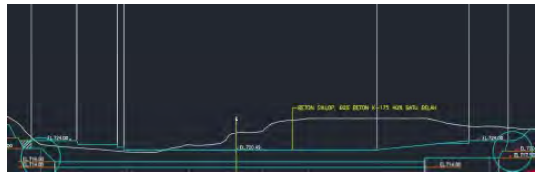
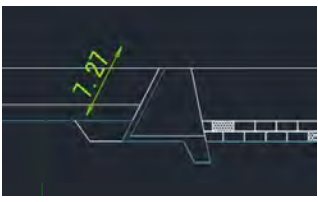
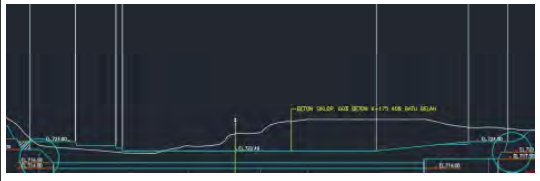
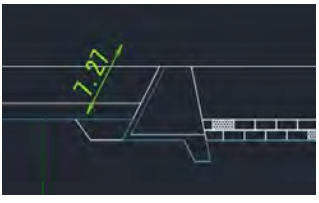
C.	Section M3				
	Formwork Length =	0,00 m'			
	Length =	18,25 m'			
	Volume =	0,00 m ²			
	Total Volume =		-	m ²	

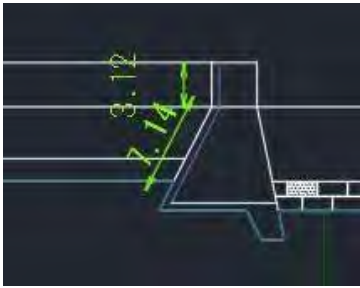
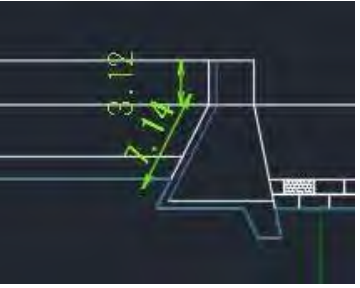

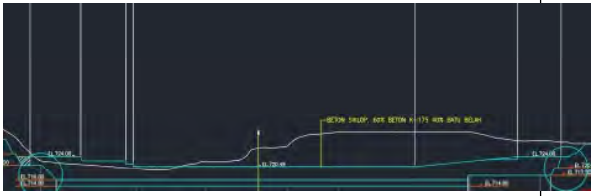


D.	Section M4				
	Formwork Length =	2,50 m'			
	Length =	3,60 m'			
	Volume =	9,00 m ²			
	Total Volume =		9,00	m ²	



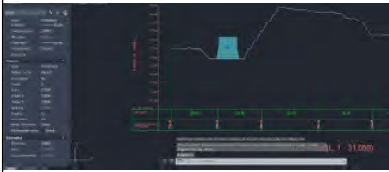

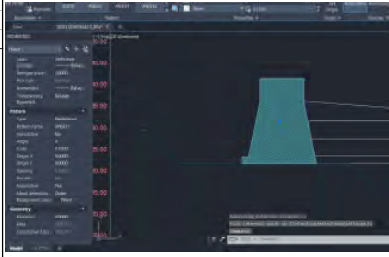



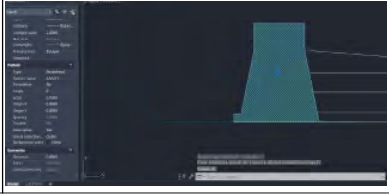

E. Section M5	Formwork Length = 10,26	m'			
	Length = 3,10	m'			
	Volume = 31,81	m ²			
	Total Volume =			31,81	m ²
					
F. Section M6	Formwork Length = 10,26	m'			
	Length = 22,00	m'			
	Volume = 225,72	m ²			
	Total Volume =			225,72	m ²
					
G. Section M7	Formwork Length = 7,27	m'			
	Length = 1,75	m'			
	Volume = 12,72	m ²			
	Total Volume =			12,72	m ²
					
H. Section M8	Formwork Length = 7,27	m'			
	Length = 33,75	m'			
	Volume = 245,36	m ²			
	Total Volume =			245,36	m ²
					



I.	Section MC	Formwork Length = 7,27	m'		
		Length = 33,75	m'		
		Volume = 245,36	m ²		
		Total Volume =		245,36	m ²
 					
I.	Section MC Joint	Formwork area = 41,74	m2		
		Numbers of formwork = 9,00	pcs		
		Volume = 375,66	m2		
		Total Volume =		375,66	m ²
 					
J.	Section M9	Formwork Length = 7,27	m'		
		Length = 33,75	m'		
		Volume = 245,36	m ²		
		Total Volume =		245,36	m ²
 					
K.	Section M10	Formwork Length = 7,27	m'		
		Length = 33,75	m'		
		Volume = 245,36	m ²		
		Total Volume =		245,36	m ²
 					

L. Section M11	Formwork Length = 10,26	m'			
	Length = 1,75	m'			
	Volume = 17,96	m ²			
	Total Volume =			17,96	m ²
					
M. Section M12	Formwork Length = 10,26	m'			
	Length = 19,00	m'			
	Volume = 194,94	m ²			
	Total Volume =			194,94	m ²
					
N. Section M13	Formwork Length = 2,50	m'			
	Length = 5,80	m'			
	Volume = 14,50	m ²			
	Total Volume =			14,50	m ²
					
O. Section M14	Formwork Length = 0,00	m'			
	Length = 50,00	m'			
	Volume = 0,00	m ²			
	Total Volume =			-	m ²
					


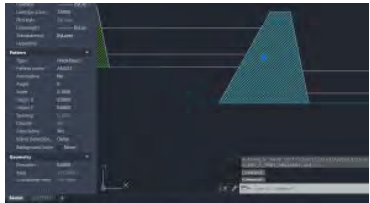
P. Section M15	Formwork Length =	0,00	m'			
	Length =	0,00	m'			
	Volume =	0,00	m ²			
	Total Volume =			-		m ²
Q. Section M16	Formwork Length =	0,00	m'			
	Length =	8,20	m'			
	Volume =	0,00	m ²			
	Total Volume =			-		m ²
Non Exposed Formwork Sub Total Volume =					1.863,75	m²
Non Exposed Formwork Total Volume =					17.172,96	m²

Name Structure : : CD Kobokan 5
 Type of work : : Joint Filler (Maindam)

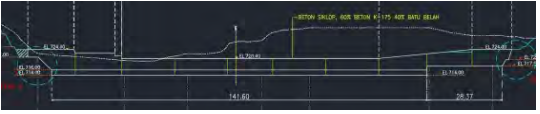
No.	Description	Calculation	Volume	Unit	Drawing Reference
A	Section M1 Joint				
	Joint Filler Area =	128,45 m2			
	Numbers of Joint Filler =	3,00 pcs Ka-Ki			
	Volume =	385,35 m2			
	Total Volume =		385,35	m2	
					
B	Section M5 Joint				
	Joint Filler Area =	244,22 m2			
	Numbers of Joint Filler =	1,00 pcs			
	Volume =	244,22 m2			
	Total Volume =		244,22	m2	
					
C	Section M7 Joint				
	Joint Filler Area =	566,34 m2			
	Numbers of Joint Filler =	8,00 pcs			
	Volume =	4530,74 m2			
	Total Volume =		4.530,74	m2	
					
D	Section M12 Joint				
	Joint Filler Area =	244,22 m2			
	Numbers of Joint Filler =	1,00 pcs			
	Volume =	244,22 m2			
	Total Volume =		244,22	m2	
					

E	Section M13 Joint					
	Joint Filler Area =	128,45	m2			
	Numbers of Joint Filler =	3,00	pcs			
	Volume =	385,35	m2			
	Total Volume =			385,35	m2	
 						
Joint Filler Sub Total Area =					5,789,88	m²


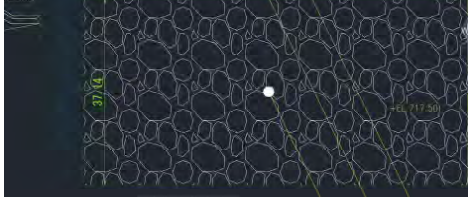
Name Structure : : CD Kobokan 5
Type of work : : Joint Filler (Subdam)

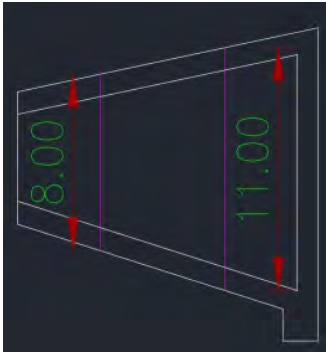
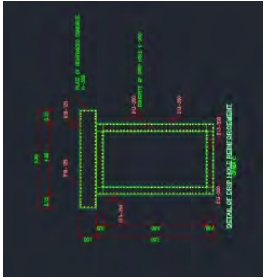
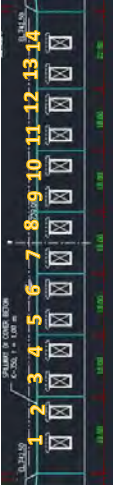
No.	Description	Calculation	Volume	Unit	Drawing Reference	
G.	Section M7 Joint					
	Joint Filler Area =	115,50	m2			
	Numbers of Joint Filler =	5,00	pcs			
	Volume =	577,50	m2			
	Total Volume =			577,50	m2	
 						
Joint Filler Sub Total Area =					577,50	m²

Name Structure : : CD Kobokan 5
Type of work : : Joint Filler (Sub-Subdam)

No.	Description	Calculation	Volume	Unit	Drawing Reference	
I.	Section MC Joint					
	Joint Filler Area =	41,74	m2			
	Numbers of Joint Filler =	9,00	pcs			
	Volume =	375,66	m2			
	Total Volume =			375,66	m ²	
 						
Joint Filler Sub Total Area =					375,66	m²



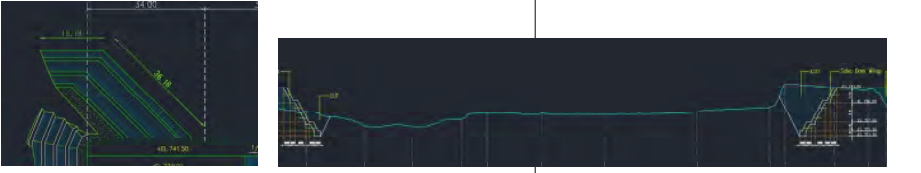
All Joint Filler Total Area =					6,743,04	m²
Joint Filler Thickness =					0,02	m'
Joint Filler Total Volume =					134,86	m3

Name Structure :		: CD Kobokan 5			
Type of work :		: Boulder Rip-Rap			
No.	Description	Calculation	Volume	Unit	Drawing reference
1					
	Area =	62,56 m ²	2.323,38	m ³	
	Length =	37,140 m			
					
		Boulder Rip-Rap Total Volume =	2.323,38	m³	

Name Structure : CD Koblen 5 Type of work : Reinforcing Steel													
No.	Code	Diameter (mm)	Distance (m)	Transverse length (m)	Long and abridged (m)	Length (m)	Curved	Length Total (m)	Weight per m' (kg/m)	Weight Total (kg)	Numbers of bar	Weight Total (kg)	Noted
													
													
													
A Slab Reinforcement (019-125)													
1	Tul.Utama	19	0.125	12.80	8.00	12.80		8	2.23	832	104	1855,36	
	Tul.Bagi	19	0.125	8.00		12.80		8	2.23	832	65	1855,36	
2	Tul.Utama	19	0.125	12.80		12.80		8	2.23	832	104	1855,36	
	Tul.Bagi	19	0.125	8.00		12.80		8	2.23	832	65	1855,36	
3	Tul.Utama	19	0.125	12.80		12.80		8	2.23	832	104	1855,36	
	Tul.Bagi	19	0.125	8.00		12.80		8	2.23	832	65	1855,36	
4	Tul.Utama	19	0.125	12.80		12.80		8	2.23	832	104	1855,36	
	Tul.Bagi	19	0.125	8.00		12.80		8	2.23	832	65	1855,36	
5	Tul.Utama	19	0.125	12.80		12.80		8	2.23	832	104	1855,36	
	Tul.Bagi	19	0.125	8.00		12.80		8	2.23	832	65	1855,36	
6	Tul.Utama	19	0.125	12.80		12.80		8	2.23	832	104	1855,36	
	Tul.Bagi	19	0.125	8.00		12.80		8	2.23	832	65	1855,36	
7	Tul.Utama	19	0.125	12.80		12.80		8	2.23	832	104	1855,36	
	Tul.Bagi	19	0.125	8.00		12.80		8	2.23	832	65	1855,36	


8	Tul.Utama Tul.Bagi	19 19	0.125 0.125	1.00 1.00	12,80 8,00	8 12,80				2,23 2,23	832 832	104 65	1855,36 1855,36
9	Tul.Utama Tul.Bagi	19 19	0.125 0.125	1.00 1.00	12,80 8,00	8 12,80				2,23 2,23	832 832	104 65	1855,36 1855,36
10	Tul.Utama Tul.Bagi	19 19	0.125 0.125	1.00 1.00	12,80 8,00	8 12,80				2,23 2,23	832 832	104 65	1855,36 1855,36
11	Tul.Utama Tul.Bagi	19 19	0.125 0.125	1.00 1.00	12,80 8,00	8 12,80				2,23 2,23	832 832	104 65	1855,36 1855,36
12	Tul.Utama Tul.Bagi	19 19	0.125 0.125	1.00 1.00	12,80 8,00	8 12,80				2,23 2,23	832 832	104 65	1855,36 1855,36
13	Tul.Utama Tul.Bagi	19 19	0.125 0.125	1.00 1.00	12,80 8,00	8 12,80				2,23 2,23	832 832	104 65	1855,36 1855,36
14	Tul.Utama Tul.Bagi	19 19	0.125 0.125	1.00 1.00	12,80 8,00	8 12,80				2,23 2,23	832 832	104 65	1855,36 1855,36
5	Drainage Hole Reinforcement (D13-200)												
1	Tul.Utama Tul.Bagi	13 13	0.125 0.125	1.00 1.00	40 11,00	11 40,00				1,04 1,04	3531 3560	321 89	3672,24 3702,40
2	Tul.Utama Tul.Bagi	13 13	0.125 0.125	1.00 1.00	40 11,00	11 40,00				1,04 1,04	3531 3560	321 89	3672,24 3702,40
3	Tul.Utama Tul.Bagi	13 13	0.125 0.125	1.00 1.00	40 11,00	11 40,00				1,04 1,04	3531 3560	321 89	3672,24 3702,40
4	Tul.Utama Tul.Bagi	13 13	0.125 0.125	1.00 1.00	40 11,00	11 40,00				1,04 1,04	3531 3560	321 89	3672,24 3702,40
5	Tul.Utama Tul.Bagi	13 13	0.125 0.125	1.00 1.00	40 11,00	11 40,00				1,04 1,04	3531 3560	321 89	3672,24 3702,40
6	Tul.Utama Tul.Bagi	13 13	0.125 0.125	1.00 1.00	40 11,00	11 40,00				1,04 1,04	3531 3560	321 89	3672,24 3702,40
7	Tul.Utama Tul.Bagi	13 13	0.125 0.125	1.00 1.00	40 11,00	11 40,00				1,04 1,04	3531 3560	321 89	3672,24 3702,40


8	Tul.Utama Tul.Bagi	13 13	0.125 0.125	1.00 1.00	40 11,00	11 40,00	1,04 1,04	3531 3560	321 89	3672,24 3702,40	
9	Tul.Utama Tul.Bagi	13 13	0.125 0.125	1.00 1.00	40 11,00	11 40,00	1,04 1,04	3531 3560	321 89	3672,24 3702,40	
10	Tul.Utama Tul.Bagi	13 13	0.125 0.125	1.00 1.00	40 11,00	11 40,00	1,04 1,04	3531 3560	321 89	3672,24 3702,40	
11	Tul.Utama Tul.Bagi	13 13	0.125 0.125	1.00 1.00	40 11,00	11 40,00	1,04 1,04	3531 3560	321 89	3672,24 3702,40	
12	Tul.Utama Tul.Bagi	13 13	0.125 0.125	1.00 1.00	40 11,00	11 40,00	1,04 1,04	3531 3560	321 89	3672,24 3702,40	
13	Tul.Utama Tul.Bagi	13 13	0.125 0.125	1.00 1.00	40 11,00	11 40,00	1,04 1,04	3531 3560	321 89	3672,24 3702,40	
14	Tul.Utama Tul.Bagi	13 13	0.125 0.125	1.00 1.00	40 11,00	11 40,00	1,04 1,04	3531 3560	321 89	3672,24 3702,40	
							Total kg / m			155.195,04	
									Weight Reinforcing Steel Total Volume =	155.195,04 kg	155,20 ton


Name Structure :		: CD Kobokan 5			
Type of work :		: Weep Hole			
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	POT. B-B				
	Weep Hole Length =	3,50 m'			
	Number of Weep Holes in 1 Section =	6,00 pcs			
	Wall Length =	27,00 m'			
	Jarak antar Weep Hole =	2,00 m			
	Distance between Weep Holes =	13,00 pcs			
	Volume =	273,00 m'			
	Total Volume =		273,00	m'	
					
B.	POT. E-E				
	Weep Hole Length =	3,50 m'			
	Number of Weep Holes in 1 Section =	2,00 pcs			
	Wall Length =	27,00 m'			
	Jarak antar Weep Hole =	2,00 m			
	Distance between Weep Holes =	13,00 pcs			
	Volume =	91,00 m'			
	Total Volume =		91,00	m'	
					
B.	POT. F-F BUFFER FILL				
	Weep Hole Length =	3,50 m'			
	Number of Weep Holes in 1 Section =	10,00 pcs			
	Wall Length =	54,36 m'			
	Jarak antar Weep Hole =	2,00 m			
	Distance between Weep Holes =	27,00 pcs			
	Volume =	945,00 m'			
	Total Volume =		945,00	m'	
					
			Weep Hole Total Volume =	1.309,00	m'

Name Structure :		: CD Kobokan 5			
Type of work		: Geo Bag & Sandfill			
No.	Description	Calculation	Volume	Unit	Drawing reference
1					
	Number of Geobag =	6,00 Pcs			
	Fill Length =	160,00 m			
	Geobag Length =	2,40 m			
	Number of Geobags Lengthwise =	400,00 Pcs	400,00	Buah	
	Fill Area =	8,70 m ²			
	Length =	160 m			
	Moving Times =	3,000 Times			
	Total Volume =		4.176,00	m ³	

ACCESS ROAD QUANTITY SUMMARY			
No.	Description	Unit	Volume
A	Access Road to Kobokan 5, L = 175,00 m		
1	Mechanical Sand Excavation	m3	2.866,69
2	Backfill Sand (Material from Excavation, Mechanically)	m3	8.193,75
3	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	875,00
4	Concrete Floor Slab Expose Formwork with Multiflex 18 mm (TP), JaTm 0,60 m	m2	210,00
5	Concrete Floor Formwork Scaffolding with 5/7 cm Rafters 4,00 m high, JaTm 0,60 m	m2	210,00
6	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	3.279,27
7	Joint Filler	m3	2,19
8	Dowel Bar D19, L = 0,80 m	pcs	560,00
9	Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Split Stone, with Concrete Pump (CP)	m3	4.800,05
10	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	3.069,27
11	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2,50 m	m2	3.069,27
12	Guidepost	pcs	87,00
13	Box Culvert	pcs	13,00
14	U Ditch	pcs	145,00
B	Access Road to Pelintas Curah Lengkong, L = 95,00 m		
1	Mechanical Sand Excavation	m3	3.090,04
2	Backfill Sand (Material from Excavation, Mechanically)	m3	371,74
3	Concrete Making and Casting fc' = 20 Mpa (K 225) Mechanically Transported within a radius of 2000 m with a Concrete Pump (CP)	m3	475,00
4	Concrete Floor Slab Expose Formwork with Multiflex 18 mm (TP), JaTm 0,60 m	m2	114,00
5	Dismantle 1 m2 of Formwork and Scaffolding in the Normal Way (and Clear Debris) for Non Expose	m2	114,00
6	Joint Filler	m3	1,19
7	Dowel Bar D19, L = 0,80 m	pcs	304,00
8	Box Culvert	pcs	18,00
9	U Ditch	pcs	80,00
10	Guidepost	pcs	47,00
C	Access Road from Pelintas Curah Lengkong to Kobokan 5, L = 230,00 m		
1	Mechanical Sand Excavation	m3	20.531,14
2	Backfill Sand (Material from Excavation, Mechanically)	m3	2.482,24
3	Box Culvert	pcs	35,00
4	U Ditch	pcs	200,00
5	Guidepost	pcs	115,00
6	Cyclops Concrete 60% Concrete fc' 15 Mpa: 40% Split Stone, with Concrete Pump (CP)	m3	384,24
7	1 m2 Exposed Concrete Wall Formwork with 18 mm Multiflex	m2	195,60
8	1 m2 Scaffolding / Supporting Formwork Rafters 5/7 for Concrete Walls Tm 2,50 m	m2	195,60
9	Carefully dismantle 1 m2 of Formwork and Scaffolding	m2	195,60

Name Structure :		: Access Road to Kobokan 5, L = 175,00 m			
Type of work		: Concrete K-225			
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Concrete K-225				
	Width =	5,00 m'			
	Length =	175,00 m'			
	Volume =	875,00 m ³			
	Thickness =	0,30 m'			
	Total Volume =		875,00	m ³	
					
K-225 Concrete Total Volume =					875,00 m ³

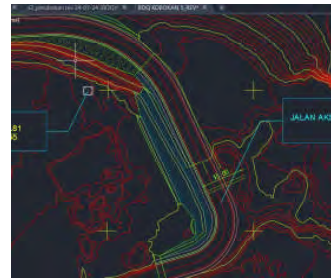
Name Structure :		: Access Road to Kobokan 5, L = 175,00 m			
Type of work		: Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Formwork				
	Width =	0,30 m'			
	Length =	525,00 m'			
	Volume =	157,50 m ²			
	Formwork Section =	52,50 m ²			
	Total Volume =		210,00	m ²	
					
Formwork Total Volume =					210,00 m ²



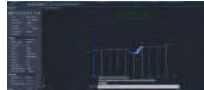

Name Structure :		: Access Road to Kobokan 5, L = 175,00 m			
Type of work		: Joint Filler			
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Total Joint Filler				
	Filler Thickness =	0,02 m'			
	Road Section Area =	1,63 m ²			
	Numbers of Joint Filler =	35,00 pcs			
	Volume =	1,14 m ³			
	Road Profile =	175,00 m			
	Slab Thickness =	0,30 m			
	Volume =	1,05 m ³			
	Total Volume =		2,19	m ³	
					
Joint Filler Total Volume =					2,19 m ³

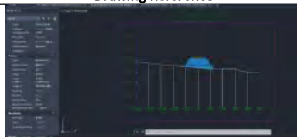
Name Structure :		: Access Road to Kobokan 5, L = 175,00 m			
Type of work		: Dowel Bar			
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Total Dowel Bar				
	Distance between dowels =	0,30 m'			
	Road Length =	175,00 m'			
	Jumlah =	583,00 pcs			
	Joint Across Each Road =	5,00 m			
	Road Length =	175,00 m'			
	Number of Joint =	35,00 pcs			
	Road Width =	5,00 m			
	Distance between dowels =	0,30 m'			
	Number of dowel =	16,00 pcs			
	Dowel Total Volume =	560,00 pcs	560,00	Pcs	
			Dowel bar Total Volume =		560,00 Pcs

Name Structure :		: Access Road to Kobokan 5, L = 175,00 m			
Type of work		: U Ditch			
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Total U Ditch				
	Road Length =	175,00 m'			
	U-Ditch Length =	1,20 m'			
	Total Volume =	145,00 pcs			
			145,00	Pcs	
			Total Volume U Ditch =		145 Pcs

Name Structure :		: Access Road to Kobokan 5, L = 175,00 m			
Type of work		: Box Culvert			
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Total Box Culvert				
	Cross Road Length =	15,00 m'			
	Box Culvert Length =	1,20 m'			
	Total Volume =	13,00 m2			
			13,00	Pcs	
			Total Volume Box Culvert =		13 Pcs

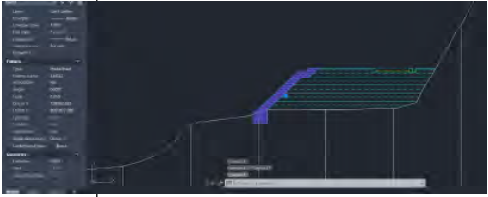


Name Structure :		: Access Road to Kobokan 5, L = 175,00 m			
Type of work		: Sand Excavation			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	STA 0+100				
	Area =	33,89			
	Length =	25,000			
	V=	$(33.89 + 33.89) / 2 \times 25.00$	847,28	m ³	
2	STA 0+125				
	Area =	46,50			
	Length =	25,000			
	V=	$(33.89 + 46.50) / 2 \times 25.00$	1.004,85	m ³	
3	STA 0+150				
	Area =	26,45			
	Length =	25,000			
	V=	$(46.50 + 26.45) / 2 \times 25.00$	911,84	m ³	
4	STA 0+175				
	Area =	12,84			
	Length =	16,000			
	V=	$(0.00 + 12.84) / 2 \times 16.00$	102,73	m ³	
San Excavation Total Volume =			2.866,69	m³	

Name Structure :		: Access Road to Kobokan 5, L = 175,00 m			
Type of work		: Backfill			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	STA 0+000				
	Area =	140,08			
	Length =	25,000			
	V=	$(140.08 + 140.08) / 2 \times 25.00$	3.501,93	m ³	
2	STA 0+025				
	Area =	121,48			
	Length =	25,000			
	V=	$(121.48 + 121.48) / 2 \times 25.00$	3.037,10	m ³	
3	STA 0+050				
	Area =	52,55			
	Length =	25,000			
	V=	$(52.55 + 52.55) / 2 \times 25.00$	1.313,63	m ³	
4	STA 0+075				
	Area =	13,31			
	Length =	25,000			
	V=	$(13.31 + 13.31) / 2 \times 25.00$	332,78	m ³	
5	STA 0+100				
	Area =	0,33			
	Length =	25,000			
	V=	$(0.33 + 0.33) / 2 \times 25.00$	8,33	m ³	
Backfill Sub Total Volume =			8.193,75	m³	

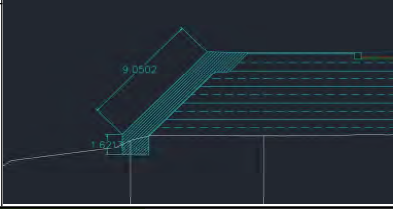
Name Structure : : Access Road to Kobokan 5, L = 175,00 m
 Type of work : Cyclop Concrete for Backfill Slope Revetment

No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Slope revetment				
	Area =	14,62 m ²			
	length of plan =	198,00 m'			
	Volume =	2893,77 m ³			
			2.893,77	m ³	
Cyclop Concrete Sub Total Volume =					2.893,77 m³



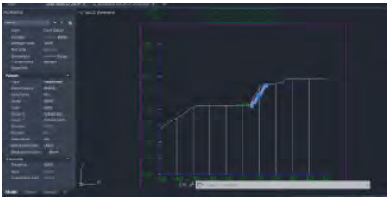
Name Structure : : Access Road to Kobokan 5, L = 175,00 m
 Type of work : Formwork Exposed

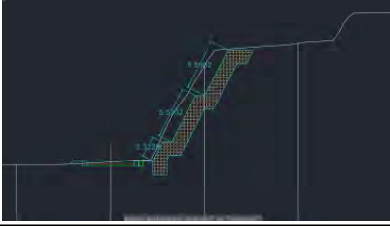
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Exposed Formwork				
	Length of 1 Section =	10,67 m			
	length of plan =	198,00 m'			
	Volume =	2112,66 m ²			
			2.112,66	m ²	
Formwork Sub Total Volume =					2.112,66 m²



Name Structure : : Access Road to Kobokan 5, L = 175,00 m
 Type of work : Cyclop Concrete for Excavation Slope Revetment


No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Slope Revetment				
	Area =	26,90 m ²			
	length of plan =	70,86 m'			
	Volume =	1906,28 m ³			
			1.906,28	m ³	
Cyclop Concrete Sub Total Volume =					1.906,28 m³



Name Structure :		: Access Road to Kobokan 5, L = 175,00 m			
Type of work :		: Formwork Exposed			
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Bekisting Expose				
	Length of 1 Section =	13,50 m			
	length of plan =	70,86 m'			
	Volume =	956,61 m2			
			956,61	m2	
					
Formwork Sub Total Volume =					
Cyclop Concrete Revetment Total Volume =					4.800,05 m³
Formwork Exposed Total Volume =					3.069,27 m²

Name Structure : : Access Road to Pelintas Curah Lengkong, L = 95,00 m
 Type of work : : K-225 Concrete


No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Concrete K-225				
	Width =	5,00 m ¹			
	Length =	95,00 m ¹			
	Volume =	475,00 m ³			
	Thickness =	0,30 m ¹			
	Total Volume =		475,00	m ³	



Concrete K-225 Total Volume = 475,00 m³

Name Structure : : Access Road to Pelintas Curah Lengkong, L = 95,00 m
 Type of work : : Formwork

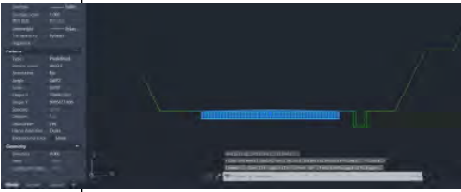
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Formwork				
	Width =	0,30 m ¹			
	Length =	285,00 m ¹			
	Volume =	85,50 m ²			
	Formwork Section =	28,50			
	Total Volume =		114,00	m ²	



Formwork Total Volume = 114,00 m²

Name Structure : : Access Road to Pelintas Curah Lengkong, L = 95,00 m
 Type of work : : Joint Filler

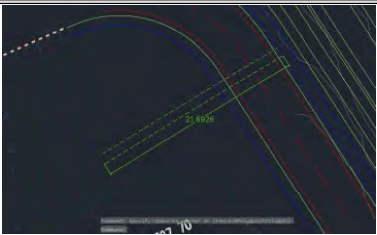
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Total Joint Filler				
	Filler Thickness =	0,02 m ¹			
	Road Section Area =	1,53 m ²			
	Numbers of Joint Filler =	19,00 m ²			
	Volume =	0,62 m ³			
	Road Profile =	95,00 m			
	Slab Thickness =	0,30 m			
	Volume =	0,57 m ³			
	Total Volume =		1,19		



Joint Filler Total Volume = 1,19 m³

Name Structure :		: Access Road to Pelintas Curah Lengkong, L = 95,00 m			
Type of work		: Dowel Bar			
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Total Dowel Bar				
	Distance between dowels =	0,30 m'			
	Road Length =	95,00 m'			
	Jumlah =	316,00 pcs			
	Joint Across Each Road =	5,00 m			
	Road Length =	95,00 m'			
	Number of Joint =	19,00 pcs			
	Road Width =	5,00 m			
	Distance between dowels =	0,30 m'			
	Number of dowel =	16,00 pcs			
	Dowel Total Volume =	304,00 pcs	304,00	pcs	
Dowel bar Total Volume =			304,00	pcs	

Name Structure :		: Access Road to Pelintas Curah Lengkong, L = 95,00 m			
Type of work		: U Ditch			
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Total U Ditch				
	Road Length =	95,00 m'			
	U-Ditch Length =	1,20 m'			
	Total Volume =	80,00 m2			
			80,00	Pcs	
Total Volume U Ditch =			80	pcs	

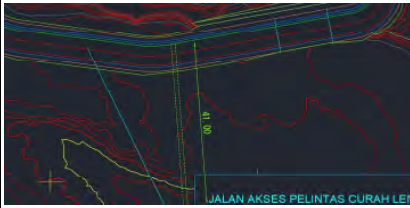
Name Structure :		: Access Road to Pelintas Curah Lengkong, L = 95,00 m			
Type of work		: Box Culvert			
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Total Box Culvert				
	Cross Road Length =	21,60 m'			
	Box Culvert Length =	1,20 m'			
	Total Volume =	18,00 m2			
	Total Volume =		18,00	Pcs	
Total Volume Box Culvert =			18	pcs	

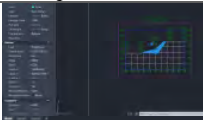


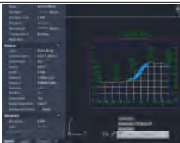
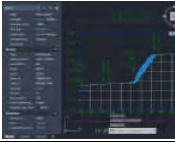
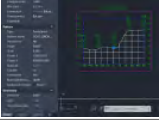
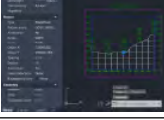
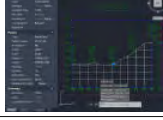
Name Structure :		: Access Road to Pelintas Curah Lengkong, L = 95,00 m			
Type of work		: Sand Excavation			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	STA 0+000				
	Area =	13,47			
	Length =	25,000			
	V=	$(13.47 + 25.00) / 2 \times 25.00$	336,70	m ³	
2	STA 0+025				
	Area =	26,88			
	Length =	25,000			
	V=	$(26.88 + 25.00) / 2 \times 25.00$	504,34	m ³	
3	STA 0+050				
	Area =	64,02			
	Length =	25,000			
	V=	$(64.02 + 25.00) / 2 \times 25.00$	1.136,25	m ³	
4	STA 0+075				
	Area =	69,02			
	Length =	25,000			
	V=	$(69.02 + 25.00) / 2 \times 25.00$	862,75	m ³	
4	STA 0+095				
	Area =	0,00			
	Length =	20,000			
	V=	$(25.00 + 0.00) / 2 \times 20.00$	250,00	m ³	
Sand Excavation Total Volume =			3.090,04	m³	

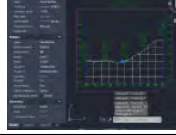
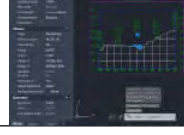
Name Structure :		: Access Road to Pelintas Curah Lengkong, L = 95,00 m			
Type of work		: Backfill			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	STA 0+075				
	Area =	0,66			
	Length =	25,000			
	V=	$(0.66 + 25.00) / 2 \times 25.00$	16,45	m ³	
2	STA 0+095				
	Area =	23,69			
	Length =	15,000			
	V=	$(23.69 + 15.00) / 2 \times 15.00$	355,29	m ³	
Backfill Total Volume =			371,74	m³	

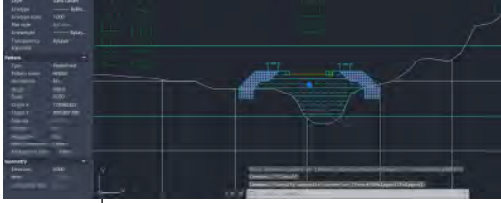
Name Structure :		: Access Road from Pelintas Curah Lengkong to Kobokan 5, L = 230,00 m				
Type of work		: U Ditch				
No.	Description	Calculation	Volume	Unit	Drawing Reference	
A.	U Ditch					
	Road Legth =	240,00 m'				
	U-Ditch Length =	1,20 m'				
	Total Volume =	200,00 m2				
	Total Volume =		200,00	Pcs		
			Total Volume U Ditch =		200 Pcs	

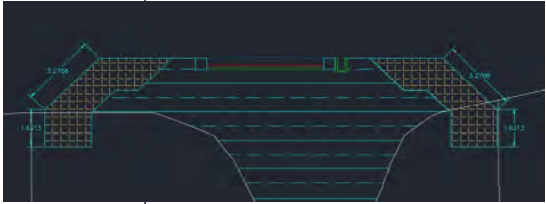
Name Structure :		: Access Road from Pelintas Curah Lengkong to Kobokan 5, L = 230,00 m				
Type of work		: Box Culvert				
No.	Description	Calculation	Volume	Unit	Drawing Reference	
A.	Total Box Culvert					
	Cross Road Length =	41,00 m'				
	Box Culvert Length =	1,20 m'				
	Total Volume =	35,00 m2				
	Total Volume =		35,00	Pcs		
			Total Volume Box Culvert =		35 Pcs	



Name Structure :		: Access Road from Pelintas Curah Lengkong to Kobokan 5, L = 230,00 m			
Type of work		: Sand Excavation			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	STA 0+000				
	Luas	215,42			
	Panjang	25,000			
		$V = (215.42 + 215.42)$	5.385,50	m ³	
2	STA 0+025				
	Luas	263,44			
	Panjang	25,000			
		$V = (215.42 + 263.44)$	5.985,76	m ³	
3	STA 0+050				
	Luas	118,24			
	Panjang	25,000			
		$V = (263.44 + 118.24)$	4.771,04	m ³	
4	STA 0+075				
	Luas	93,78			
	Panjang	25,000			
		$V = (0.00 + 93.78) / 2$	1.172,26	m ³	
5	STA 0+100				
	Luas	141,11			
	Panjang	25,000			
		$V = (25.00 + 141.11)$	2.076,41	m ³	
6	STA 0+125				
	Luas	3,79			
	Panjang	25,000			
		$V = (25.00 + 3.79) / 2$	359,85	m ³	
7	STA 0+150				
	Luas	6,75			
	Panjang	25,000			
		$V = (25.00 + 6.75) / 2$	396,91	m ³	
8	STA 0+175				
	Luas	5,67			
	Panjang	25,000			
		$V = (25.00 + 5.67) / 2$	383,40	m ³	
Sand Excavation Total Volume =			20.531,14	m³	

Name Structure :		: Access Road from Pelintas Curah Lengkong to Kobokan 5, L = 230,00 m			
Type of work		: Backfill			
No.	Description	Calculation	Volume	Unit	Drawing Reference
1	STA 0+075				
	Luas	14,02			
	Panjang	25,000			
		$V = (14.02 + 14.02) / 2 \times 25.000$	350,38	m ³	
2	STA 0+100				
	Luas	0,23			
	Panjang	25,000			
		$V = (0.23 + 0.23) / 2 \times 25.000$	5,65	m ³	
3	STA 0+175				
	Luas	1,61			
	Panjang	25,000			
		$V = (1.61 + 1.61) / 2 \times 25.000$	40,35	m ³	
4	STA 0+200				
	Luas	19,54			
	Panjang	25,000			
		$V = (19.54 + 19.54) / 2 \times 25.000$	488,50	m ³	
5	STA 0+225				
	Luas	55,04			
	Panjang	25,000			
		$V = (55.04 + 55.04) / 2 \times 25.000$	1.375,93	m ³	
6	STA 0+230				
	Luas	44,29			
	Panjang	5,000			
		$V = (44.29 + 44.29) / 2 \times 5.000$	221,44	m ³	
Backfill Total Volume =			2.482,24	m³	

Name Structure :		: Access Road from Pelintas Curah Lengkong to Kobokan 5, L = 230,00 m			
Type of work		: Cyclop Concrete for Excavation Slope Revetment			
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Slope revetment				
	Area =	19,21	m ²		
	length of plan =	20,00	m'		
	Volume =	384,24	m ³		
			384,24	m ³	
Cyclop Concrete Total Volume =			384,24	m³	

Name Structure :		: Access Road from Pelintas Curah Lengkong to Kobokan 5, L = 230,00 m			
Type of work :		: Exposed Formwork			
No.	Description	Calculation	Volume	Unit	Drawing Reference
A.	Bekisting Revetmen				
	Length of 1 Section =	9,78 m'			
	length of plan =	20,00 m'			
	Volume =	195,60 m ²			
			195,60	m ²	
					
Exposed Formwork Total Volume =				195,60	m ²