MINISTRY OF PUBLIC WORKS AND HOUSING
DIRECTORATE GENERAL OF WATER RESOURCES
DIRECTORATE OF IRRIGATION AND LOWLAND

DED Report – Design Note

Appendix 14 - UPTD Saddang Wajo

Development of the Saddang
Modernization Irrigation System
Province of Sulawesi Selatan, Indonesia

SADDANG IRRIGATION MODERNIZATION PROJECT

Contract No.: KU.02.10/Ai/IV/13, April 24, 2019

OC GLOBAL

Oriental Consultants Global Co., Ltd.
Global Consulting for Sustainable Development
Joint Venture with

February 2021

TABLE OF CONTENT

1 INTRODUCTION 4

1.1 Administrative Area and WUA within UPTD Saddang Wajo 4

1.1.1 Administrative Areas 4

1.1.2 WUA (P3A) within UPTD Saddang Wajo 4

1.2 Cropping Pattern of UPTD Saddang Wajo 4

1.2.1 Existing Cropping Pattern and Production Yield of UPTD Saddang Wajo 4

1.2.2 Modernization Cropping Pattern and Production Yield of UPTD Saddang Wajo4

2 EXISTING IRRIGATION SYSTEM OF UPTD SADDANG WAJO 6

2.1 Walk-trough Surveys on UPTD Saddang Wajo 6

3 REHABILITATION OF IRRIGATION CANALS AND STRUCTURES 7

3.1 Engineering Estimates 7

4 REHABILITATION OF DRAINAGE CANALS AND STRUCTURES 77

4.1 Existing Drainage Conditions 77

4.2 Present Condition and Issues of Drain Channels 78

4.2.1 Establishment a Drainage Schematic System 79

4.3 Catchment Area 81

4.4 Topography and Drain Elevation 81

4.5 Tidal Influence on Drains 83

4.6 Flood Discharges Design 83

4.7 Rehabilitation of Drainage Canals 86

4.8 Bills of Quantities 87

4.9 Engineering Estimates 89

ATTACHMENT 1 90

LIST OF TABLES

<Table 4.1> List of the Main and Secondary the UPTD Saddang Wajo Unit Drains 77
<Table 4.2> Q5 and Q25 Drainage Modulus (Dm) for Maximum 3 Days Rainfall in mm 84
<Table 4.3> List of Drain Channel and Design Flood 85
<Table 4.4> List of Tertiary Block and Discharge Saddang Wajo Drain 85
<Table 4.5> BoQ of SP Padonge Drain 87
<Table 4.6> Preparation Work Estimates 89
<Table 4.7> Saddang Wajo Drainage Canal Engineering Estimates 89

LIST OF FIGURES

<Figure 1.1> Layout Map of UPTD Waddang Wajo 5
<Figure 2.1> Field surveys of Irrigation Canals & Structures within the UPTD Saddang Wajo 6
<Figure 2.2> Field surveys within the UPTD Saddang Wajo converted into GIS System 6
<Figure 4.1> Soil Classification Related to Natural River and Constructed Drain (Ref) 77
<Figure 4.2> Soil Classification Related to Natural River and Constructed Drain 78
<Figure 4.3> Drainage Scheme – Saddang Wajo 80
<Figure 4.4> Rainfall Catchment area of UPTD Saddang Wajo Unit 81
<Figure 4.5> Topography of Irrigation Canals, Tertiary blocks and Drains in Saddang Wajo Unit 82
<Figure 4.6> SP Saddang Wajo Drain long section Channel Bed, Left and Right Over Bank Elevation 82
<Figure 4.7> Flood-Prone Areas of The Saddang Irrigation System, Indicated by Hatching 83
<Figure 4.8> HECRAS Ground, LOB, ROB, Q5, Q25 Water Surface Elevation 85
<Figure 4.9> Cross-Section of AK1 26 LOB, ROB, Q5 WS Elevation and Inspection Road 86
<Figure 4.10> Typical Long Section Saddang Wajo Drainage Canal 86
<Figure 4.11> Typical Long Section Saddang Wajo Drainage Canal 86

1 INTRODUCTION

1.1 Administrative Area and WUA within UPTD Saddang Wajo

1.1.1 Administrative Areas

01. UPTD Saddang Wajo covers 1 Kecamatan (sub-districts) and 2 Villages within Wajo Regency.

UPTD	Kecamatan		Desa/Kelurahan
Saddang-Wajo/ Belawa Hilir	Belawa- Hilir	1	Macero
		2	Wattang

1.1.2 WUA (P3A) within UPTD Saddang Wajo

02. There are 22 P3A and 2 GP3A within UPTD Saddang Wajo

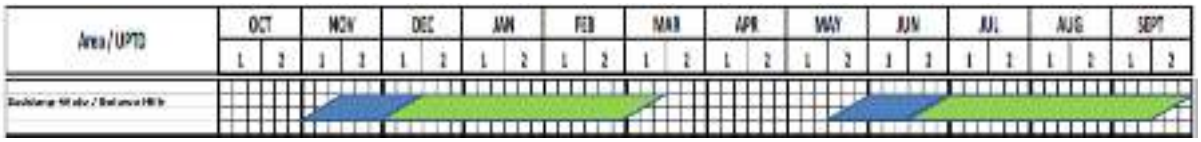
1.2 Cropping Pattern of UPTD Saddang Wajo

1.2.1 Existing Cropping Pattern and Production Yield of UPTD Saddang Wajo

03. Existing Cropping Pattern of UPTD Saddang Wajo

No	UPTD	Areal	Realization of cropping (Ha)		not cultivated (Ha)		Total	Cropping Intensity (%)
		(ha)	MT1	MT 2	MT 1	MT 2		
13	Saddang Wajo	2.260	2.260	2.260	-	-	4.520	200%

04. Existing Production Yield of UPTD Saddang Wajo

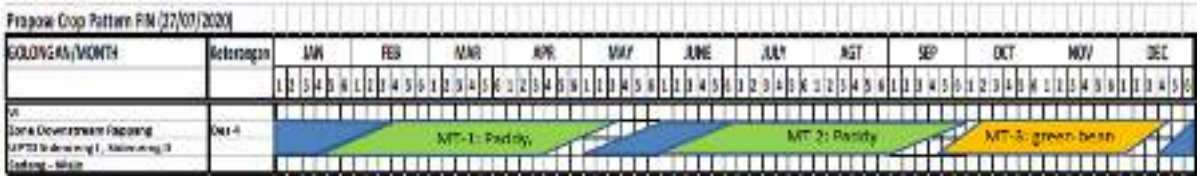


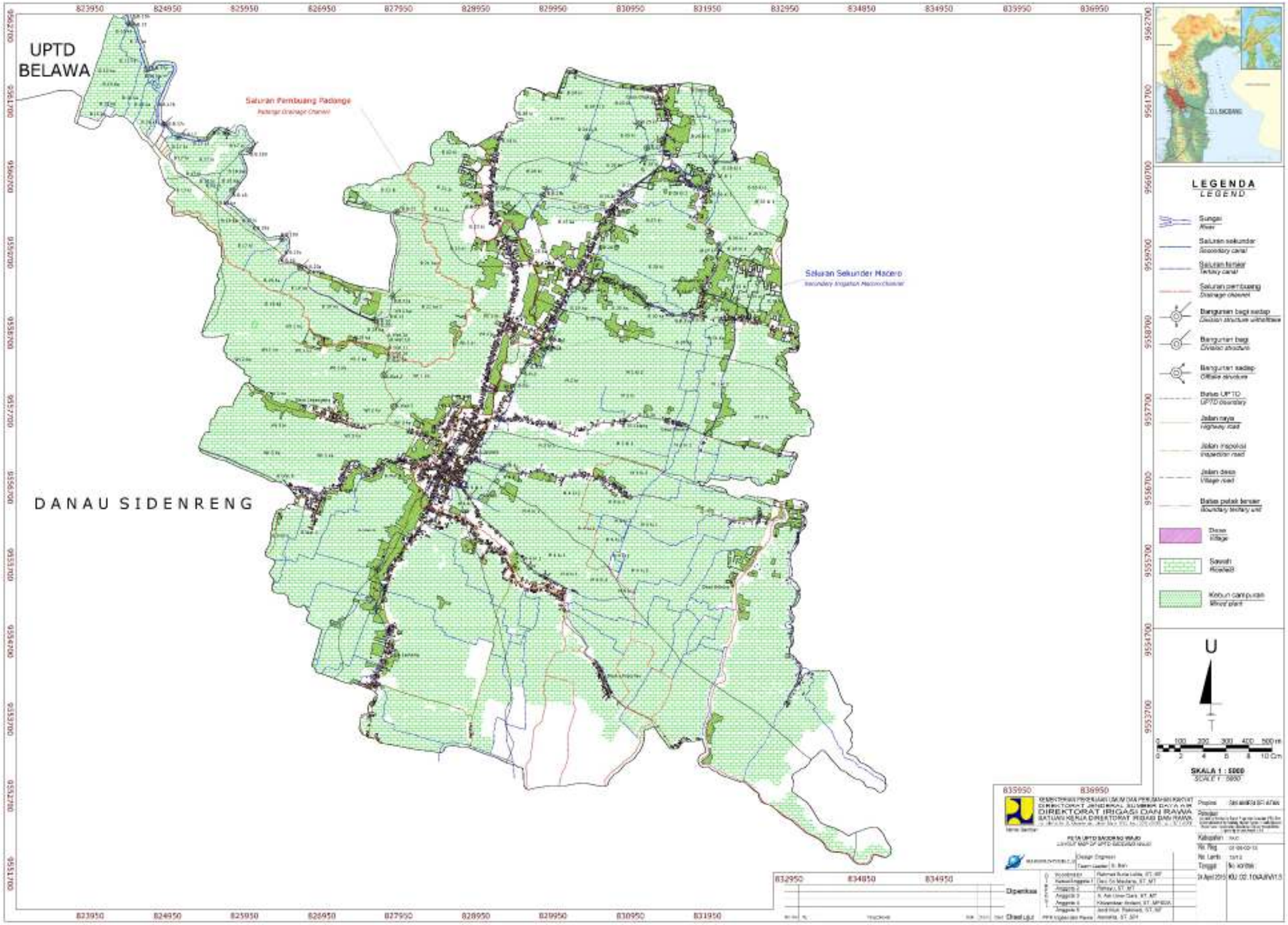
1.2.2 Modernization Cropping Pattern and Production Yield of UPTD Saddang Wajo

05. Modernization Cropping Pattern of UPTD Saddang Wajo

No	UPTD	Areal (ha)*	Eksisting Cropping Intensity	Propose 2022	2023	2024	2025	2026
13	Saddang Wajo	2.150,65	200%	210%	220%	240%	260%	275%

06. Modernization Production Yield of UPTD Saddang Wajo





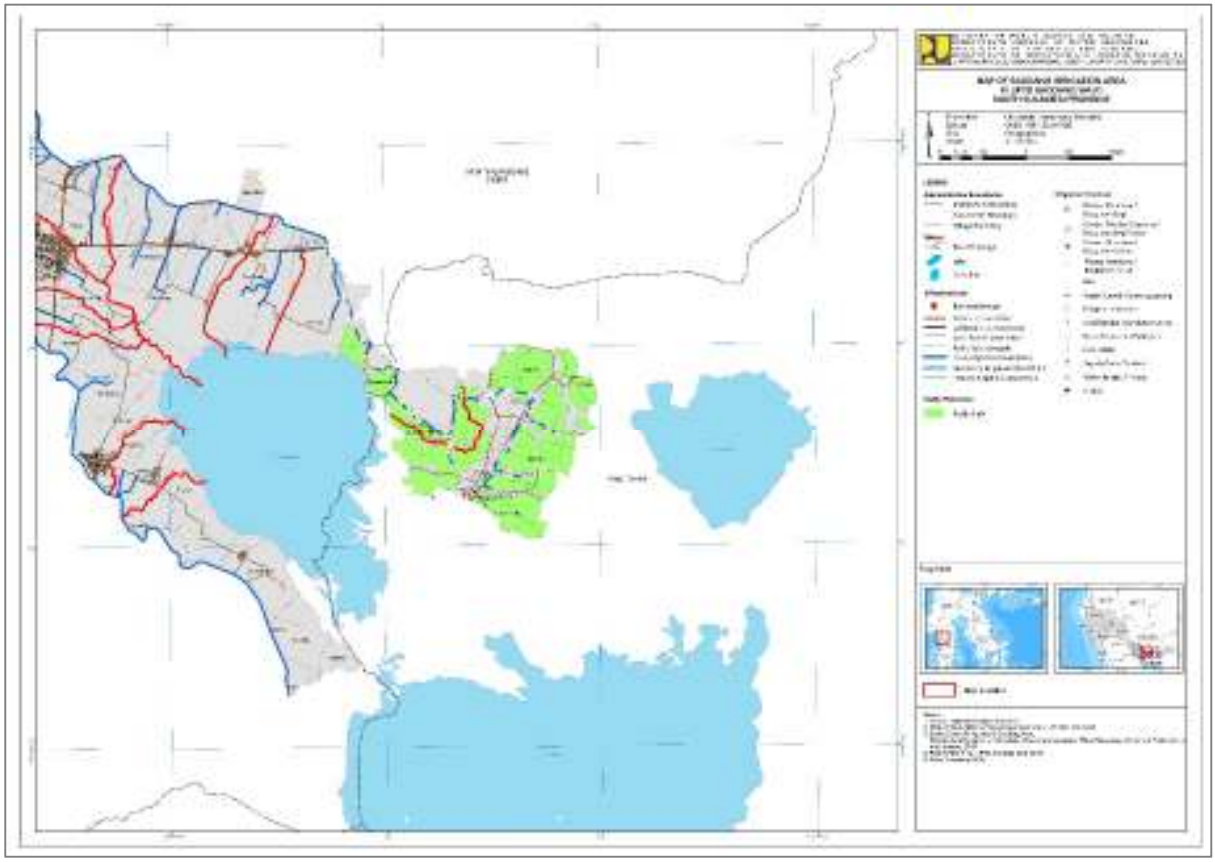
<Figure 1.1> Layout Map of UPTD Waddang Wajo

2 EXISTING IRRIGATION SYSTEM OF UPTD SADDANG WAJO

2.1 Walk-trough Surveys on UPTD Saddang Wajo

07. During the assignment, PPC Saddang has made a complete walkthrough surveys on UPTD Sawitto and prepared all the field survey onto the GIS system as shown in the figure below.

<Figure 2.1> Field surveys of Irrigation Canals & Structures within the UPTD Saddang Wajo



<Figure 2.2> Field surveys within the UPTD Saddang Wajo converted into GIS System

3 REHABILITATION OF IRRIGATION CANALS AND STRUCTURES

3.1 Engineering Estimates

[illegible]

PERHITUNGAN HARGA PERKIRAAN PEKERJAAN

1. HARGA PERKIRAAN PEKERJAAN SALURAN DAN BANGUNAN UPTD SADDANG WAJO

DAFTAR KUANTITAS DAN HARGA
DAERAH IRIGASI SADDANG (UPTD SADDANG WAJO)
Tahun Anggaran 2021

No.	Uraian Pekerjaan	Kode Analisa	Satuan	Kuantitas	Harga Satuan (Rp)	Total Harga (Rp)
I	PEKERJAAN PERSIAPAN					
1	Pengadaan Direksi Keja	[illegible]	m²	242.00	439,401.78	106,356,427.87
2	Bedeh Kerja	[illegible]	m²	80.00	3,496,527.50	279,722,200.00
3	Papan Nama Pekerjaan	[illegible]	buah	1.00	551,025.00	551,025.00
4	Mobilisasi dan Demobilisasi					
	a. Peralatan Ringan	[illegible]	Ls	1.00	11,040,001.20	11,040,001.00
	b. Sewa Lahan	[illegible]	Ls	1.00	27,000,000.20	27,000,200.00
	c. Fasilitas Sementara (Kantor, Pos Jaga, Bangkel, Gudang, Pelikan)	[illegible]	Ls	1.00	[illegible]	[illegible]
	d. Keamanan Lapangan	[illegible]	Ls	1.00	658,950,000.20	658,950,200.00
5	Pasang Dokumentasi	[illegible]	Set	5.00	2,868,100.20	14,340,500.00
6	Pemeliharaan Pekerjaan (Termasuk Jaring Pengaman)	[illegible]	Ls	1.00	[illegible]	[illegible]
7	Ukur Topo Situasi	T.02.a	m²	83,012.00	4,034.80	261,067,737.60
8	Pemasangan Bow Stuk	T.02.b2	m²	2,421.00	75,675.75	183,210,590.75
9	Pengambilan (BOC) dan MC (BC)					
	a. Pengambilan dengan CBD	[illegible]	Ls	1,000.00	616,675.20	616,675,200.00
	b. Pemadatan jambu Lawat, Tempuk, Potongan dan Detail	[illegible]	Ls	1,000.00	156,354.20	156,354,200.00
10	Copy dan Penggandaan Foto Kontrak Laporan (Foto Copy dan dll)	[illegible]	Set	15.00	[illegible]	[illegible]
11	As Built Drawing (Gambar dan Copy Dokumen Ukuran A3, A2, A1)	[illegible]	Set	5.00	1,242,000.20	6,210,200.00
12	Komunikasi dan Koordinasi Antar Instansi dan Masyarakat (PS)		Ls	1.00	[illegible]	[illegible]
					TOTAL - I	4,050,236,908.74
II	SALURAN SEKUNDER BELAWA (BB.500 - BB.693)					
2.1	PEKERJAAN TANAH					
1	Perbaikan dan Stripping dengan manual	[illegible]	m²	97,427.96	9,771.25	[illegible]
2	Kupasan Tebal Tanah dengan manual	[illegible]	m		[illegible]	-
3	Lmb Galian Tanah secara manual	TM.02.a.1	m³	9,473.03	89,339.59	850,945,529.03
4	Galian Sedimen secara manual	TM.02.a	m³	9,226.12	132,436.88	1,221,883,270.25
5	Mengangkut material non basah galian tanah, jarak angkut 5 km menggunakan Dump Truck	TM.02.b23	m³	6,632.00	97,132.[illegible]	644,076,518.54
6	Mengangkut material non basah galian tanah, jarak angkut 12 km menggunakan Dump Truck	TM.02.b33	m³	12,069.00	265,431.56	3,203,760,238.21
7	Timbunan tanah berbah	TM.05.b.3).1	m	25,529.94	52,555.63	1,342,212,029.[illegible]
8	Mengangkut Tanah dari Borrow Area, jarak angkut 10 km, dengan menggunakan Abt Dump Truck	TM.05.b.3).1	m	19,757.94	341,936.15	6,755,278,496.[illegible]
9	Pemadatan Tanah (cara mekanis), dengan stamper	TM.[illegible]	m³	25,529.94	62,409.54	1,601,272,595.[illegible]
10	Pekerjaan Tulan Sil. Base Course	T.14.c.1	m³	8,254.32	106,674.61	882,515,059.[illegible]
					Sub Total 2.1	16,802,119,[illegible]
2.3	PEKERJAAN PASANGAN BATU DAN BETON					
1	Pembesian [illegible] (tulangan polos)	B.17.a1	kg	[illegible]	[illegible]	[illegible]
2	Beton Mutu fc = 19.3 Mpa (K-225) Ready Mix, tanpa pompa	B.13.a.3.1	m³	345.25	3,066,358.75	1,302,501,191.62
3	Pembersihan [illegible] Bekisting [illegible]	B.27.b	m²	-	[illegible]	-
4	Pasangan Lanjutan Sampah	T.11.a	m²		15,721.25	
5	Pembuatan dan Pemasangan Patok Hektometer	T.05.b	bh	156.01	[illegible]	[illegible]
6	Pembuatan dan Pemasangan Patok Kilometer	T.05.c	Uk	15.00	493,629.01	7,404,435.1[illegible]
7	Pembuatan dan Pemasangan Patok Sempadan	T.05.d	bh	156.01	[illegible]	[illegible]
					Sub Total 2.3	1,918,346,987.[illegible]

No.	Uraian Pekerjaan	Kode Analisa	Satuan	Koefisien	Harga Satuan (Rp)	Total Harga Rp
2.4	PEKERJAAN TANAH DI BANGUNAN SALURAN SEKUNDER BELAWA (BB.300 - BB.697)					
1	Pembersihan dan Stripping	T.01.a.1	m²	-	9,571.75	-
2	Galian Tanah secara manual	T.04.03.a.1	m³	-	49,971.09	-
3	Timbunan Tanah Kembali	T.14.a	m³	-	52,255.63	-
4	Pemadatan Tanah (per. mekanis), dengan stamper	T.14.b	m²	-	52,107.54	-
					Sub Total 2.4	-
2.4	PEKERJAAN PASANGAN BATU DAN BETON DI BANGUNAN SALURAN SEK. BELAWA (BB.300 - BB.697)					
1	Pasangan Batu Belangan Batu (semi-kubik), dengan menggunakan perekat Mortar Semen	B.01.c.31	m³	-	1,127,211.02	-
2	Pekerjaan Pasangan Batu Kali, dengan mortar tipe N, adukan dengan campuran 1 PC : 4 PP	B.01.c.21	m³	-	971,238.10	-
3	Pekerjaan Plesteran Tebal 1,5 cm, dengan mortar tipe S, acuan dengan campuran 1 PC : 3 PP	B.04.e	m²		129,851.70	
4	Pekerjaan Acian	B.04.g	m²	-	51,271.91	-
5	Cetakan Lantai Beton, opsen dengan multiplex 18 mm (IV)	B.25.a	m²	-	175,207.55	-
6	Pembesian 1 kg dengan baja polos/ulir (Pembesian Pelat)	B.17.a	kg	-	24,290.47	-
7	Pembesian wiremesh M7 untuk pelat	B.02.b	kg	-	19,293.28	-
8	Beton Mutu fc = 19.3 MPa (K-225) Ready Mix Tanpa Pompa	B.13.a.1	m³	-	1,166,259.75	-
9	Pekerjaan Siaran	B.05.a	m²		85,504.34	
10	Pembangunan 1 m² Bekisting untuk lubang-lubang	B.27.b	m²	-	9,573.75	-
					Sub Total 2.4	-
2.5	PEKERJAAN PINTU DI SALURAN SEKUNDER BELAWA (BB.300 - BB.697)					
	Pintu Sorong - 0,30 m x H = 0,30 m		Unit	-	37,930,571.25	-
2	Pintu Sorong - 0,40 m x H = 0,40 m		Unit	-	41,183,613.20	-
3	Pintu Sorong - 0,30 m x H = 1,00 m		Unit	-	44,141,596.25	-
4	Pintu Sorong - 1,00 m x H = 1,00 m		Unit	-	46,087,540.25	-
5	Pekerja Mister Tinggi Kurus Air		Unit	-	318,190.71	-
					Sub Total 2.5	
					TOTAL II	15,597,466,780.51
III	SALURAN SEKUNDER MAKORO					
3.1	PEKERJAAN TANAH					
1	Pembersihan dan Stripping dengan manual	T.01.a.1	m²	3,446.10	9,571.75	33,234,814.10
2	Kupasan Tebas Tebang dan bersihkan lokasi	T.01.b	m²		129,851.70	-
3	Galian Tanah secara manual	T.04.03.a.1	m³	857.20	59,833.63	51,305,778.20
4	Galian Sedimen secara manual	T.04.b	m³	294.54	112,196.48	33,051,310.05
5	Mengangkat material dan buang pada jarak tanah, jarak angkut 5 km menggunakan Dump Truck	T.04.b.2)	m³	641.10	62,292.19	39,938,993.06
6	Mengangkat material dan buang pada jarak tanah, jarak angkut 10 km menggunakan Dump Truck	T.04.b.3)	m³	553.55	263,338.44	145,830,931.06
7	Timbunan tanah kembali	T.14.02.b.3).1	m³	1,247.23	52,655.63	65,628,007.36
8	Mengangkat Tanah dari Gerobak Arus, jarak angkut 10 km, dengan menggunakan Alat Berat Dump Truck	T.14.02.b.3).1	m³	516.31	344,515.16	177,881,973.75
9	Pemadatan Tanah Timbunan kembali, dengan stamper	T.14.b	m²	1,247.23	62,427.14	77,891,676.11
10	Pekerjaan Jalan Sub Base Course	T.14.d	m³	1,235.79	106,674.61	131,832,225.42
					Sub Total 3.1	759,510,264.59
3.2	PEKERJAAN PASANGAN BATU DAN BETON					
1	Pembesian wiremesh M7 untuk pelat	B.17.a	kg	-	19,083.28	-
2	Beton Mutu fc = 19.3 Mpa (K-225) Ready Mix, tanpa pump	B.13.a.2.1	m³	-	1,166,259.75	-
3	Pembangunan 1 m² Bekisting untuk lubang-lubang	B.27.b	m²	-	9,573.75	-
4	Pemasangan Lantai Kerikil	0	m³	-	19,751.23	-
5	Pembelian dan Pemasangan Pipa Hollow	T.01.b	bh	3.100	2,91,054.16	6,021,239.99
6	Pembelian dan Pemasangan Pipa Kiloan	T.01.c	bh	2.100	493,623.10	903,269.02
7	Pembelian dan Pemasangan Pipa Sempaan	T.01.e	bh	3.100	2,91,054.16	6,021,239.99
					Sub Total 3.2	13,990,337.91

No.	Uraian Pekerjaan	Kode Analisa	Satuan	Koefisien	Harga Satuan (Rp)	Total Harga (Rp)
3.3	PEKERJAAN TANAH DI BANGUNAN SALURAN SEKUNDER MACRO					
1	Pembersihan dan Stripping	T.01.a.1	m²	-	9,533.35	-
2	Galian Tanah secara manual	D.02.a.1	m³		81,135.00	
3	Timbunan Tanah Lokal	T.14.a	m³	-	32,222.63	-
4	Pemadatan Tanah (alat manual), dengan stamper	T.14.L	m²	-	60,427.24	-
					Sub Total 3.3	-
3.4	PEKERJAAN PASANGAN BATU DAN BETON DI BANGUNAN SALURAN SEK. MACRO					
1	Pengadaan dan Pasangan Batu (aan mekanis), dengan mortar pembuat Jack Hammer	P.01.e.11	m³	-	117,211.72	-
2	Pekerjaan Pasangan Batu Kali, dengan mortar tipe S, setara dengan campuran 1 PC : 4 PP	P.01.e.21	m³	-	971,233.10	-
3	Pekerjaan Plesteran Tebal 2,5 cm dengan mortar tipe S, setara dengan campuran 1 PC : 3 PP	P.04.e	m²	-	100,151.20	-
4	Pekerjaan Acian	B.27.b	m²	-	34,671.00	-
5	Beton Lantai Beton Lantai dengan mutu fc' 18 mm (BF)	B.21.a	m³		163,227.85	
6	Pembesian Polos dengan baja polos (Tulangan Polos)	B.17.a	kg	-	24,350.47	-
7	Pembesian ulir dengan BJ tertentu setel	B.23.b	kg	-	[illegible]	-
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

REKAP ANALISA HARGA DASAR
&
REKAP ANALISA HARGA SATUAN PEKERJAAN

DAFTAR HARGA SATUAN PEKERJAAN
DAERAH IRIGASI SADDANG - TAHUN ANGGARAN 2021

No	Nama Pekerjaan	Harga Satuan	
1	1 m2 Pembersihan / Stripping manual	Rp	9,573.75
2	1 m2 Pembersihan dan Stripping / Kosrekan menggunakan alat berat	Rp	11,771.39
3	1 m' Uitzet Trase Saluran	Rp	4,284.80
4	Pasang 1 m' Profil Melintang Galian Tanah	Rp	52,508.25
5	Pemasangan 1 m' Bouwplank	Rp	75,575.75
6	Pemasangan 1 m' Bouwplank	Rp	37,937.88
7	Patok Kayu (Ukuran 5/7)	Rp	14,594.94
8	1 bh Patok hektometer (uk. 0,15 x 0,15 x 1 m)	Rp	250,394.49
9	Patok Tetap Utama (PTU)	Rp	498,529.72
10	1 m3 Galian Tanah Biasa (manual) sedalam ≤ 1 m	Rp	88,333.69
11	1 m3 Galian Tanah Biasa (manual) sedalam > 1 m s.d 2 m	Rp	107,104.69
12	1 m3 Galian Tanah Biasa (semi mekanis) sedalam ≤ 1 m	Rp	67,357.24
13	1 m3 Galian Tanah Biasa (semi mekanis) sedalam > 1 m s.d 2 m	Rp	73,750.04
[illegible]	[illegible]	[illegible]	[illegible]
35	1 m3 Beton Mutu fc = 14,5 Mpa (K-225) dengan concrete plant	Rp	1,193,705.46
36	Pembesian 1 kg dengan besi polos/ulir (Pembesian Pelat)	Rp	24,380.47
37	Pembesian 100 kg jaring kawat (Wiremesh M7) untuk pelat atau dinding	Rp	19,083.38
38	Pembesian 100 kg jaring kawat (Wiremesh M10) untuk pelat atau dinding	Rp	23,619.00
39	Pembesian 1 kg dengan besi polos/ulir (Pembesian Kolom, Balok, Ring Balk, dan Sloof)	Rp	27,994.68
40	1 m2 Bekisting Lantai Beton Biasa dengan multiplex 12 mm atau 18 mm	Rp	105,367.00
41	1 m2 Bekisting Pondasi dan Sloof Beton Biasa menggunakan papan 3/20 cm	Rp	228,677.50
42	Pemasangan 1 m'2 genteng metal ukuran 80 x 100 atap pelana	Rp	88,748.4

No	Nama Pekerjaan	Kode Analisa	Satuan	Harga Satuan	
43	Pemasangan Pintu Angkat b = 0,20 m, H = 0,40 m		bh	Rp	2,604,556
44	Pemasangan Pintu Angkat b = 0,20 m, H = 0,40 m		bh	Rp	3,321,045
45	Pemasangan Pintu Angkat b = 0,40 m, H = 0,50 m		bh	Rp	3,514,152
46	Pemasangan Pintu Angkat b = 0,40 m, H = 0,60 m		bh	Rp	3,768,835
47	Pemasangan Pintu Angkat b = 0,50 m, H = 0,50 m		bh	Rp	3,691,676
48	Pemasangan Pintu Angkat b = 0,50 m, H = 0,70 m		bh	Rp	4,268,429
49	Pemasangan Pintu Angkat b = 0,60 m, H = 0,70 m		bh	Rp	4,616,764
50	Pint. Sorong b = 0,40 m, H = 0,50 m		bh	Rp	42,172,095.90
51	Pint. Sorong b = 0,50 m, H = 0,50 m		bh	Rp	37,570,574
52	Pint. Sorong b = 0,50 m, H = 0,80 m		bh	Rp	41,512,427
53	Pint. Sorong b = 0,50 m, H = 1,20 m		bh	Rp	46,170,616.05
54	Pint. Sorong b = 0,50 m, H = 0,70 m		bh	Rp	40,799,443.05
55	Pint. Sorong b = 0,60 m, H = 0,70 m		bh	Rp	40,487,613
56	Pint. Sorong b = 0,60 m, H = 0,90 m		bh	Rp	41,535,470
57	Pint. Sorong b = 0,60 m, H = 0,40 m		bh	Rp	36,412,011.35
58	Pint. Sorong b = 0,60 m, H = 1,15m		bh	Rp	46,552,070.93
59	Pint. Sorong b = 0,80, H = 0,55 m		bh	Rp	38,572,56.11
60	Pint. Sorong b = 0,80 m, H = 0,80 m		bh	Rp	38,013,223.05
61	Pint. Sorong b = 0,80 m, H = 0,90 m		bh	Rp	39,[illegible]
[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
[illegible]	[illegible]		[illegible]	[illegible]	[illegible]

DAFTAR HARGA DASAR BAHAN DAN UPAH

No	Uraian	Satuan		Harga Satuan (Rp)	Keterangan
I	UPAH TENAGA KERJA				
1	Pekerja	OH	..01	124,500.00	
2	Tukang (kayu, batu, cat, listrik, pipa, besi)	OH	..02	140,000.00	
3	Kepala Tukang (kayu, batu, cat, listrik, pipa, besi)	OH	..03	163,000.00	
4	Mandor	OH	..04	142,500.00	
5	Juru Ukur, Operator, Mekanik, Alat Berat	OH	..05	142,500.00	
6	Pembantu Juru ukur, Operator, Mekanik, Alat Berat	OH	..06	124,500.00	
7	Sopir Dump Truck	OH	..07	135,500.00	
8	Sopir Pembantu Dump Truck	OH	..08	124,500.00	
9	Penjaga Malam	OH	..09	124,500.00	
10	Drafter CAD / Manual	OH	..10	124,500.00	
11	Desain Engineer	OH	..11	660,000.00	
12	Ahli Muda	OH	..12	550,000.00	
13	Ahli Madya	OH	..13	660,000.00	
14	Ahli Utama	OH	..14	1,000,000.00	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

No	Uraian	Satuan		Harga Satuan (Rp)	Keterangan
C	**KELOMPOK LOGAM**				
1	Paku Biasa	kg	M.16	20,000.00	
2	Paku Sekrup 1 - 2cm	d.s	M.18.a	50,000.00	
3	Paku Payung	d.s	M.18.b	30,000.00	
4	Paku asbes	d.s	M.17	50,000.00	
5	Paku Tripleks	kg	M.17.b	21,877.00	
6	Kawat Beton	kg	M.18	18,250.00	
7	Kawat Las	kg	M.18.a	24,000.00	
8	Kawat harmonika tebal 3mm	m2	M.18.b	50,000.00	
9	Kawat harmonika tebal 4mm	m2	M.18.c	140,000.00	
10	Besi beton polos / Ulir	kg	M.19	18,000.00	
11	Wiremesh 7 mm	kg	M.19.a	15,466.00	
13	Wiremesh 8mm	kg	M.19.b	19,332.55	
14	Besi Sik./ 70.70.7	btg	M.20.a	275,000.00	
15	Besi Sik./ 60.60.6	btg	M.20.a.1	225,000.00	
16	Besi Sik./ 50.50.5	btg	M.20.b	175,000.00	
17	Besi Sik./ 40.40.4	btg	M.20.c	65,000.00	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
6	Pipa PVC AW merk Wavin dia. 3/4" 4,00 m	m	W.25.c	80,750.00	
7	Pipa Beton Berulang Dia. 1.00 m	m	W.25.d	500,000.00	
8	Pipa Beton Berulang Dia. 0.80 m	m	W.25.e	450,000.00	
9	Pipa Beton Berulang Dia. 0.60 m	m	W.25.f	400,000.00	
10	Pintu Sorong Baja B= 240 H = 270	bh	PS.1	97,041,356.67	
11	Pintu Sorong Baja B= 100 H = 100	bh	PS.2	38,427,095.42	
12	Pintu Sorong Baja B= 90 H = 100	bh	PS.3	28,806,508.38	
13	Pintu Sorong Baja B= 90 H = 95	bh	PS.4	20,704,684.63	
14	Pintu Sorong Baja B= 85 H = 85	bh	PS.5	18,888,450.40	
15	Pintu Sorong Baja B= 80 H = 90	bh	PS.6	12,018,615.66	
17	Pintu Sorong Baja B= 60 H = 70	bh	PS.6	10,193,750.00	
18	Pintu Sorong Baja B= 50 H = 90	bh	PS.6	8,896,700.00	
19	Pintu Sorong Baja B= 50 H = 50	bh	PS.6	5,097,000.00	

No	Uraian	Satuan		Harga Satuan (Rp)	Keterangan
III	KELOMPOK PERALATAN				
1	Dump Truck	Jam	E.01	389,233.34	
2	Roller Vibrator	Jam	E.02	607,454.80	
3	Baby Roller 1 - 2 ton	Jam	E.02.a	100,000.00	
4	Excavator Standart	Jam	E.03	962,115.19	
5	Excavator Mini	Jam	E.03.a	521,639.80	
6	Excavator Long Arm	Jam	E.03.b	964,215.11	
7	Excavator 1 + Ponton 1	Jam	E.03.c	1,238,433.94	
8	Ponton 2	Jam	E.03.d	340,584.72	
9	Tongkang	Jam	E.03.e	3,376,219.10	
10	Perahu	Jam	E.03.f	79,092.94	
11	Bulldozer D85P-12	Jam	E.04	965,292.96	
12	Motor Grader	Jam	E.05	681,480.36	
13	Wheel Loader	Jam	E.06	972,027.54	
14	Water Tank Truck	Jam	E.07	366,129.80	
15	Stamper	Jam	E.08	65,105.36	
16	Jack hammer	Jam	E.09	66,567.07	
17	Concrete Mixer/Kloson	Jam	E.10.a	66,343.25	
18	Concrete Vibrator	Jam	E.10.b	63,212.95	
19	Concrete Plant	Jam	E.10.c	752,273.16	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

No	Uraian	Satuan		Harga Satuan (Rp)	Keterangan
61	Pneumatic Roller	Jam	E.44	578,191.41	
62	Asphalt Sprayer	Jam	E.45	50,700.00	
63	Asphalt Hand Mixer	Jam	E.46	43,900.00	
64	Truck loader	Jam	E.47	479,200.00	
65	Water pump	Jam	E.48	40,500.00	
66	Trailer 20 ton	Jam	E.49	584,000.00	
67	Pile driver + diesel hammer	Jam	E.50	113,700.00	
68	Crane on truck (35 ton)	Jam	E.51	503,200.00	
69	welding set	Jam	E.52	151,700.00	
70	Pecestrian roller	Jam	E.53	84,900.00	
71	hand compactor	Jam	E.54	73,500.00	
72	Concrete paving machine	Jam	E.55	569,500.00	
73	Concrete cutter	Jam	E.56	85,900.00	
74	Ponton angkut	Jam	E.57	168,200.00	
75	Ironton	Jam	E.58	735,000.00	
76	cold milling machine	Jam	E.59	1,761,000.00	
77	Concrete Pan Mixer	Jam	E.60	584,100.00	
78	Concrete breaker	Jam	E.61	620,100.00	
79	Aspal Tanker	Jam	E.62	588,000.00	
80	Cement Tanker	Jam	E.63	588,000.00	
81	Jack Tension	sewa/jam	E.64	217,191.73	
82	[illegible]	[illegible]	[illegible]	[illegible]	

ANALISA HARGA SATUAN PEKERJAAN

1. ANALISA PEKERJAAN TANAH

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Seddang
Analisa : PERMEN 28/PRT/M/216 ? D.01
Uraian Pekerjaan : 1 Bush Kistdam Pasir/Tanah dibungkus Karung Plastik Bagor 13cm x 65cm
Harga Satuan : Rp 12,385.50 / bh

OKF

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga				
	Pekerja	OH	0.0400	124,500.00	4,980.00
	Mandor	OH	0.0040	142,500.00	570.00
II	Bahan				
	Karung Plastik/bagor/goni	bush	1.000	3,500.00	3,500.00
	Tali Rapia / plastik	m'	2.000	500.00	1,000.00
	Sewa Pasir	m3	0.012	60,000.00	720.00
III	Alat				
[illegible]	[illegible]				
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]				[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]				
[illegible]	[illegible]				[illegible]
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]				[illegible]

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN 28/PRT/M/2016 ? D.04
Uraian Pekerjaan : Pengoperasian perjam Pompa Air Diesel daya 5 kW dengan suction head maksimal 3 m dan discharge head maksimal 70 m (Kapasitas 0,5 m3/s pada suction head 1m dan discharge head 10m)
Harga Satuan : Rp 87,457.68 / jam

OKE

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga				
	Pekerja	OH	0.1250	124,500.00	15,562.50
	Operator Pompa	OH	0.1250	142,500.00	17,812.50
	Mandor	OH	0.0130	142,500.00	1,852.50
II	Bahan				
	Solar	liter	3.500	9,500.00	33,250.00
III	Alat				
	Pompa Air diesel 5 kW	sewa/jam	0.1500	50,484.38	7,572.66
IV	**Sub Total**				**76,050.16**
V	**Biaya tidak langsung (overhead)**	%	**15.00**		**11,407.52**
VI	**Harga Satuan Pekerjaan per : jam**				**87,457.68**
VI	**Harga Satuan Pekerjaan per : hari**				**2,098,984.32**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - T.01.a
Uraian Pekerjaan : 1 m2 Pembersihan / Strong manual
Harga Satuan : Rp. 9,573.75 / m2

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga.				
	1. Pekerja	OH	0.060	124,500.00	7,470.00
	2. Mandor	OH	0.006	142,500.00	855.00
II	Bahan.				
III.	Alat				
IV	**Sub Total**				**8,325.00**
V	**Biaya tidak langsung (overhead)**	%	**15.00**		**1,248.75**
VI	**Harga Satuan Pekerjaan per : m2**				**9,573.75**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - T.01.a.1
Uraian Pekerjaan : 1 m2 Pembersihan dan Striping / Kasrekan, menggunakan alat berat
Harga Satuan : Rp. 11,771.36 / m2

OKE

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga.				
	1. Pekerja	OH	0.060	124,500.00	7,470.00
	2. Mandor	OH	0.006	142,500.00	855.00
II	Bahan.				
III.	Alat				
	1. Bulldozer	Sewa/jam	0.002	955,292.99	1,910.58
IV	**Sub Total**				**10,235.96**
V	**Biaya tidak langsung (overhead)**	%	**15.00**		**1,535.39**
VI	**Harga Satuan Pekerjaan per : m2**				**11,771.36**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - T.08.a.1)
Uraian Pekerjaan : 1 m3 Galian Tanah Biasa (manual) sedalam ≤ 1 m
Harga Satuan : Rp. 89,833.60 / m3

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga.				
	1. Pekerja	OH	0.5630	124,500.00	70,093.50
	2. Mandor	OH	0.0563	142,500.00	8,022.75
II	Bahan				
III	Alat				
IV	**Sub Total**				**78,116.25**
V	**Biaya tidak langsung (overhead)**	%	**15.00**		**11,717.44**
VI	**Harga Satuan Pekerjaan per : m3**				**89,833.60**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - T.08.b.1)
Uraian Pekerjaan : 1 m3 Galian Tanah Biasa (semi mekanik) sedalam ≤ 1 m
Harga Satuan : Rp. 67,367.54 / m3

OKE

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga				
	1. Pekerja	OH	0.220	124,500.00	27,390.00
	2. Mandor	OH	0.022	142,500.00	3,135.00
II	Bahan				
	1. BBM non subsidi	liter	0.50	9,500.00	4,750.00
III	Alat				
	1. Jack hammer	sewa/jam	0.050	466,109.47	23,305.47
IV	**Sub Total**				**58,580.47**
V	**Biaya tidak langsung (overhead)**	%	**15.00**		**8,787.07**
VI	**Harga Satuan Pekerjaan per : m3**				**67,367.54**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - T.10.a.1
Uraian Pekerjaan : 1 m3 Galian Lumpur (manual) sedalam ≤ 1 m
Harga Satuan : Rp. 132,436.88 / m3

OKE

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I.	Tenaga.				
	1. Pekerja	OH	0.830	124,500.00	103,335.00
	2. Mandor	OH	0.083	142,500.00	11,827.50
II	Bahan				
III.	Alat.				
IV.	**Sub Total**				**115,162.50**
V.	**Biaya tidak langsung (overhead)**	%	**15.00**		**17,274.38**
VI.	**Harga Satuan Pekerjaan per : m3**				**132,436.88**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - T.10.b.1
Uraian Pekerjaan : 1 m3 Galian Lumpur (semi mekanis) sedalam ≤ 1 m
Harga Satuan : Rp. 108,850.25 / m3

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I.	Tenaga.				
	1. Pekerja	OH	0.240	124,500.00	29,880.00
	2. Mandor	OH	0.024	142,500.00	3,420.00
II	Bahan				
	1. Solar Non Subsid	liter	0.900	9,500.00	8,550.00
III.	Alat				
	1. Pompa lumpur diesel 2,5 KW; 3"	sewa/hari	0.150	352,015.96	52,802.39
IV.	**Sub Total**				**94,652.39**
V.	**Biaya tidak langsung (overhead)**	%	**15.00**		**14,197.86**
VI.	**Harga Satuan Pekerjaan per : m3**				**108,850.25**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - T.14.a
Uraian Pekerjaan : 1 m3 Timbunan Tanah Kembali
Harga Satuan : Rp. 52,655.63 / m3

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I.	Tenaga				
	1. Pekerja	OH	0.330	124,500.00	41,085.00
	2. Mandor	OH	0.033	142,500.00	4,702.50
II	Bahan				
III.	Alat.				
IV.	**Sub Total**				**45,787.50**
V.	**Biaya tidak langsung (overhead)**	%	**15.00**		**6,868.13**
VI	**Harga Satuan Pekerjaan per : m3**				**52,655.63**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - T.14.b
Uraian Pekerjaan : 1 m3 Pemadatan Tanah (dengan stamper)
Harga Satuan : Rp. 62,407.54 / m3

OKE

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I.	Tenaga.				
	1. Pekerja	OH	0.250	124,500.00	31,125.00
	2. Mandor	OH	0.003	142,500.00	356.25
II	Bahan				
III.	Alat				
	1. Stamper	sewa/hari	0.050	455,723.50	22,786.18
IV.	**Sub Total**				**54,267.43**
V.	**Biaya tidak langsung (overhead)**	%	**15.00**		**8,140.11**
VI.	**Harga Satuan Pekerjaan per : m3**				**62,407.54**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - A.2.3.1.1-
Uraian Pekerjaan : Pengurugan 1 m3 batu belah
Harga Satuan : Rp. 187,076.25

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga				
	Pekerja	OH	0.0250	124,500.00	3,112.50
	Mandor	OH	0.0250	142,500.00	3,562.50
II	Bahan				
	Batu	m3	1.2000	130,000.00	156,000.00
III	Alat				
IV	**Sub Total**				**162,675.00**
V	**Biaya tidak langsung (overhead)**	%	**15.00**		**24,401.25**
VI	**Harga Satuan Pekerjaan per : m3**				**187,076.25**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - TM.02.b.2).1
Uraian Pekerjaan : DT mengangkut tanah dari Borrow Area ke lokasi Pekerjaan sejauh 5 km
Harga Satuan : Rp. 176,314.69 / m3

OKE

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I.	Tenaga.				
II	Bahan				
	1. Tanah Timbunan	m3	1.10	62,500.00	68,750.00
III.	Alat.				
	1. Dumptruck	sewa/jam	0.21727	389,233.31	84,567.12
IV.	**Sub Total**				**153,317.12**
V.	**Biaya tidak langsung (overhead)**	**%**	**15.00**		**22,997.57**
VI	**Harga Satuan Pekerjaan per : m3**				**176,314.69**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - TM.02.b.3)
Uraian Pekerjaan : Mengangkut 1 m3 tanah dari jarak angkut 10 km, menggunakan Dump Truck
Harga Satuan : Rp. 265,453.66 / m3

OKE

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I.	Tenaga.				
II	Bahan				
III.	Alat.				
	1. Dumptruck	sewa/jam	0.5930	389,233.34	230,829.27
IV.	**Sub Total**				**230,829.27**
V.	**Biaya tidak langsung (overhead)**	**%**	**15.00**		**34,624.39**
VI	**Harga Satuan Pekerjaan per : m3**				**265,453.66**

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 – T.14.d.1
Uraian Pekerjaan : 1 M2 Pemadatan Lapisan Sub Base Course (jalan inspeksi dan jalan akses), menggunakan peralatan Alat Berat
Harga Satuan : Rp. 106,674.61 / m2

OKE

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I.	Tenaga.				
	1. Pekerja	OH	0.100	124,500.00	12,450.00
	2. Mandor	OH	0.010	142,500.00	1,425.00
II.	Bahan				
	1. Sirtu	m3	0.360	130,000.00	46,800.00
III.	Alat.				
	1. Bulldozer	sewa/jam	0.0200	995,292.99	19,898.70
	2. Water Tank Truck	sewa/jam	0.0023	366,129.83	854.30
	3. Roller Vibro	sewa/jam	0.0178	637,454.82	11,332.53
IV.	**Sub Total**				**92,760.53**
V.	**Biaya tidak langsung (overhead)**	%	**15.00**		**13,914.08**
VI.	**Harga Satuan Pekerjaan per : m2**				**106,674.61**

2. ANALISA PEKERJAAN PASANGAN

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 P.01.c
Uraian Pekerjaan : 1 m2 Plesteran Tebal 1,5 cm, Mortar Tipe S, setara campuran 1 PC : 3 PP.
Harga Satuan : Rp. 107,366.05 / m2

OKE

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga.				
	1. Pekerja	OH	0.384	124,500.00	47,808.00
	2. Tukang Batu	OH	0.192	140,000.00	26,880.00
	3. Kepala Tukang	OH	0.019	163,000.00	3,097.00
	4. Mandor	OH	0.019	142,500.00	2,707.50
[illegible]	[illegible]				
	5. [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	6. [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]				
[illegible]	[illegible]				[illegible]
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]				[illegible]

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN 28/PRT/M/216 - T.03.b
Uraian Pekerjaan : 1 bh Patok hektometer (uk. 0,15 x 0,15 x 1 m)
Harga Satuan : Rp. 250,064.16 / bh

OKE

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga				
	Pekerja	OH	0.2500	124,500.00	31,125.00
	Tukang	OH	0.2500	140,000.00	35,000.00
	Mandor	OH	0.0150	142,500.00	2,137.50
II	Bahan				
	Beton Cor K-175	m3	0.0230	1,285,618.00	29,569.21
	Pembesian	kg	2.415	24,390.47	58,902.97
	Bekisting	m2	0.1800	165,207.85	29,737.41
	Cat (Avian)	kg	0.2000	62,000.00	12,400.00
	Minyak Cat	ltr	0.2500	34,300.00	8,575.00
III	Alat				
	Kuas	bh	1.0000	10,000.00	10,000.00
IV	**Sub Total**				**217,447.10**
V	**Biaya tidak langsung (overhead)**	**%**	**15.00**		**32,617.06**
VI	**Harga Satuan Pekerjaan per : bh**				**250,064.16**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN 28/PRT/M/216 - T.03.c
Uraian Pekerjaan : 1 bh Patok Kilometer
Harga Satuan : Rp. 498,629.72 / bh

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga				
II	Bahan				
	1. Galian Tanah biasa	m3	0.300	89,833.69	26,950.11
	2. Timbunan Pasir	m3	0.020	68,364.45	1,367.29
	3. Pembesian	kg	4.100	27,994.68	114,778.19
	4. Bekisting	m2	0.880	105,367.60	90,616.14
	5. Beton Mutu, Fc= 11,5 Mpa (K175)	m3	0.090	1,377,885.75	68,679.31
	6. Pen Kunci untuk [illegible] pengukuran	buah	1.000	10,000.00	10,000.00
	7. Patok Ukuran 12 x 12 cm Tulisan grafir	buah	1.050	115,000.00	120,750.00
III	Alat				
IV	**Sub Total**				**433,591.06**
V	**Biaya tidak langsung (overhead)**	**%**	**15.00**		**65,038.66**
VI	**Harga Satuan Pekerjaan per : bh**				**498,629.72**

[illegible]

No.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]				
IV	**Sub Total**				**219,447.36**
V	**Biaya tidak langsung (overhead)**	%	**15.00**		**32,917.11**
VI	**Harga Satuan Pekerjaan per : bh**				**252,364.49**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 – D.01.c.2
Uraian Pekerjaan : 1 m3 Pasangan Batu, Mortar Tipe N, setara campuran 1 PC : 4 PP
Harga Satuan : Rp. 971,033.10 / m3

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga.				
	1. Pekerja	OH	1.800	121,900.00	324,100.00
	2. Tukang batu	OH	0.900	140,000.00	126,000.00
	3. Mandor	OH	0.180	142,500.00	25,650.00
II	Bahan.				
	1. Batu belah	m3	1.200	150,000.00	180,000.00
	2. Pasir Pasang	m3	0.520	97,200.00	50,544.00
	3. Portland Cement	Kg	163.000	1,280.00	208,640.00
III.	Alat				
	1. Concrete Mixer	Sewa/hari	0.076	387,402.78	29,442.61
IV.	**Sub Total**				**844,376.61**
V.	**Biaya tidak langsung (overhead)**	%	**15.00**		**126,656.49**
VI	**Harga Satuan Pekerjaan per : m3**				**971,033.10**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - P.01.e.1
Uraian Pekerjaan : Bongkar 1 m3 Pasangan batu dan pembersihan batu (manual)
Harga Satuan : Rp. 217,789.00 / m3

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I.	Tenaga				
	1. Pekerja	OH	1.400	124,500.00	174,300.00
	2. Mandor	OH	0.140	142,500.00	19,950.00
II	Bahan				
III.	Alat				
	1. Palu / Godam (baja keras)	buah	0.008	30,000.00	240.00
	2. Pahat beton (baja keras)	buah	0.012	250,000.00	3,000.00
	3. Linggis (baja keras)	buah	0.020	25,000.00	500.00
IV.	**Sub Total**				**197,990.00**
V.	**Biaya tidak langsung (overhead)**	%	**15.00**		**19,799.00**
VI	**Harga Satuan Pekerjaan per : m3**				**217,789.00**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - P.01.e.4
Uraian Pekerjaan : Pembersihan 1 m3 Bongkaran pasangan batu untuk pemanfaatan kembali material batu
Harga Satuan : Rp. 31,416.00 / m3

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I.	Tenaga				
	1. Pekerja	OH	0.200	124,500.00	24,900.00
	2. Mandor	OH	0.020	142,500.00	2,850.00
II	Bahan				
III.	Alat				
	1. Palu / Godam (baja keras)	buah	0.002	30,000.00	60.00
	2. Pahat beton (baja keras)	buah	0.003	250,000.00	750.00
IV.	**Sub Total**				**28,560.00**
V.	**Biaya tidak langsung (overhead)**	%	**15.00**		**2,856.00**
VI	**Harga Satuan Pekerjaan per : m3**				**31,416.00**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - P.02.c.1
Uraian Pekerjaan : Pasangan Bata Merah Mortar Tipe N, setara campuran 1 PC : 4 PP (manual)
Harga Satuan : Rp. 1,190,283.60 / m3

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I.	Tenaga				
	1. Pekerja	OH	2.400	124,500.00	298,800.00
	2. Tukang Batu	OH	1.200	140,000.00	168,000.00
	3. Mandor	OH	0.240	142,500.00	34,200.00
II.	Bahan				
	1. Bata Merah	buah	500.000	650.00	325,000.00
	2. Portland cement	kg	175.000	1,280.00	224,000.00
	3. Pasir Pasang	m3	0.330	97,200.00	32,076.00
III.	Alat				
IV.	**Sub Total**				**1,082,076.00**
V.	**Biaya tidak langsung (overhead)**	%	**15.00**		**108,207.60**
VI	**Harga Satuan Pekerjaan per : m3**				**1,190,283.60**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - P.03.a
Uraian Pekerjaan : 1 m2 Saluran, Mortar Tipe N, setara campuran 1 PC : 2 PP
Harga Satuan : Rp. 85,504.34 / m3

OKE

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga				
	1. Pekerja	OH	0.300	124,500.00	37,350.00
	2. Tukang batu	OH	0.150	140,000.00	21,000.00
	3. Kepala Tukang	OH	0.015	163,000.00	2,445.00
	4. Mandor	OH	0.030	142,500.00	4,275.00
II	Bahan				
	1. Pasir Pasang	m3	0.012	97,200.00	1,166.40
	2. Portland Cement	Kg	6.340	1,280.00	8,115.20
III.	Alat				
IV.	**Sub Total**				**74,351.60**
V.	**Biaya tidak langsung (overhead)**	%	**15.00**		**11,152.74**
VI	**Harga Satuan Pekerjaan per : m2**				**85,504.34**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - P.04.g
Uraian Pekerjaan : 1 m2 Pekerjaan Adar
Harga Satuan : Rp. 54,571.00 / m2

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga.				
	1. Pekerja	OH	0.200	124,500.00	24,900.00
	2. Tukang batu	OH	0.100	140,000.00	14,000.00
	3. Kepala Tukang	OH	0.010	163,000.00	1,630.00
	4. Mandor	OH	0.020	142,500.00	2,850.00
II	Bahan.				
	1. Portland Cement	Kg	3.250	1,280.00	4,160.00
III.	Alat				
IV.	**Sub Total**				**47,540.00**
V.	**Biaya tidak langsung (overhead)**	%	**15.00**		**7,131.00**
VI	**Harga Satuan Pekerjaan per : m2**				**54,671.00**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - P.12.a
Uraian Pekerjaan : 1 m2 Penanaman Rumput lemparan
Harga Satuan : Rp. 19,751.25 / m2

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I.	Tenaga.				
	1. Pekerja	OH	0.100	124,500.00	12,450.00
	2. Mandor	OH	0.010	142,500.00	1,425.00
II	Bahan				
	Sebelah rumput	m2	1.100	3,000.00	3,300.00
III.	Alat				
IV.	**Sub Total**				**17,175.00**
V.	**Biaya tidak langsung (overhead)**	%	**15.00**		**2,576.25**
VI.	**Harga Satuan Pekerjaan per : m2**				**19,751.25**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - P.17
Uraian Pekerjaan : 1 m' Pelschel/Meter Dugo Huka Air
Harga Satuan : Rp. 318,030.05 / m'

OKE

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I.	Tenaga				
	1. Pekerja	OH	0.250	124,500.00	31,125.00
	2. Mandor	OH	0.025	142,500.00	3,562.50
	3. Ahli Mesin (Spl/hidrolisi)	OH	0.025	650,000.00	
II	Bahan				
	1. Meter ukur besi/aluminium pelat (panjang 1m)	m'	1.000	63,000.00	63,000.00
	2. Pasangan batu merah 1pc : 4ps	m3	0.090	1,190,283.60	107,125.52
	3. Batang siku L.40.40.4	kg	5.900	6,543.20	38,584.85
	4. Pelat setip 3 x 30 x 300mm	kg	0.500	31,500.00	15,750.00
	5. dynabolt/isomset ø 8 mm panjang 4.5 cm	buah	4.000	2,500.00	10,000.00
III.	Alat				
	1. Alat Bantu	s	1.000	10,000.00	10,000.00
IV.	**Sub Total**				**276,547.87**
V.	**Biaya tidak langsung (overhead)**	%	**15.00**		**41,482.18**
VI.	**Harga Satuan Pekerjaan per : m'**				**318,030.05**

3. ANALISA PEKERJAAN BETON

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - B.02.1
Uraian Pekerjaan : 1 m3 Beton Mutu, fc = 7,4 Mpa (K 100) dengan campuran alat
Harga Satuan : Rp. 990,814.97 / m3

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga				
	1. Pekerja	jam	0.653	124,500.00	81,250.00
	2. Tukang Batu	jam	0.326	142,000.00	46,662.73
	3. Kepala Tukang	jam	0.033	165,000.00	5,318.78
	4. Mandor	jam	0.065	142,500.00	9,299.70
II	Bahan				
	1. Portland Cement	kg	254.410	1,280.00	325,644.80
	2. Pasir Beton	m3	0.621	115,000.00	71,414.99
	3. Kerikil	m3	0.740	169,500.00	125,253.00
	4. Air	ltr	214.240	200.00	42,848.00
III.	Alat				
	1. Concrete plant	sewa/jam	0.065	757,270.16	49,093.99
	2. Truck Mixer	sewa/jam	0.113	582,524.68	65,921.96
	3. Concrete Pump	sewa/jam	0.094	454,404.00	42,609.48
	4. Concrete Vibrator	sewa/jam	0.042	55,212.65	2,243.92
IV.	**Sub Total**				**861,578.23**
V.	**Biaya tidak langsung (overhead)**	%	**15.00**		**129,236.73**
VI	**Harga Satuan Pekerjaan per : m3**				**990,814.97**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - B.05.a.1
Uraian Pekerjaan : 1 m3 Beton Mutu, fc = 14,5 Mpa (K-175) dengan concrete plant
Harga Satuan : Rp. 1,129,579.12 / m3

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga.				
	1. Pekerja	jam	0.6526	124,500.00	81,250.03
	2. Tukang batu	jam	0.3263	140,000.00	45,682.73
	3. Kepala Tukang	jam	0.0326	163,000.00	5,318.79
	4. Mandor	jam	0.0653	142,500.00	9,299.70
II	Bahan.				
	1. Portland Cement	kg	326.73	1,280.00	429,798.40
	2. Pasir Beton	m3	0.6138	115,000.00	70,592.31
	3. Kerikil	m3	0.7718	162,500.00	125,406.28
	4. Air	liter	214.2400	200.00	42,848.00
III.	Alat				
	1. Concrete Plant	sewa/jam	0.0657	752,270.16	49,068.94
	2. Truck Mixer	sewa/jam	0.1132	582,524.89	65,921.96
	3. Concrete Pump	sewa/jam	0.1205	454,704.00	54,783.61
	4. Concrete Vibrator	sewa/jam	0.0422	53,212.85	2,243.92
IV.	**Sub Total**				**982,242.72**
V.	**Biaya tidak langsung (overhead)**	%	**15.00**		**147,336.41**
VI	**Harga Satuan Pekerjaan per : m3**				**1,129,579.12**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - B.07.a.1
Uraian Pekerjaan : 1 m3 Beton Mutu, fc = 14,5 Mpa (K-225) dengan concrete plant
Harga Satuan : Rp. 1,193,706.46 / m3

DKE

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga.				
	1. Pekerja	jam	0.6526	124,500.00	81,250.03
	2. Tukang batu	jam	0.3263	140,000.00	45,682.73
	3. Kepala Tukang	jam	0.0326	163,000.00	5,318.79
	4. Mandor	jam	0.0653	142,500.00	9,299.70
II	Bahan.				
	1. Portland Cement	kg	384.120	1,280.00	489,126.40
	2. Pasir Beton	m3	0.564	115,000.00	64,853.46
	3. Kerikil	m3	0.785	162,500.00	127,603.13
	4. Air	liter	214.240	200.00	42,848.00
III.	Alat				
	1. Concrete Plant	sewa/jam	0.0651	752,270.16	49,061.94
	2. Truck Mixer	sewa/jam	0.1132	582,524.89	65,921.96
	3. Concrete Pump	sewa/jam	0.1205	454,704.00	54,783.61
	4. Concrete Vibrator	sewa/jam	0.0422	53,212.85	2,243.92
IV.	**Sub Total**				**1,038,005.62**
V.	**Biaya tidak langsung (overhead)**	%	**15.00**		**155,700.84**
VI	**Harga Satuan Pekerjaan per : m3**				**1,193,706.46**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - B.17.a
Uraian Pekerjaan : Pembesian 100 kg dengan besi polos/ulir (Pembesian Pelat)
Harga Satuan : Rp. 2,439,046.50 / 100 kg
Harga Satuan : Rp. 24,390.47 / kg

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga.				
	1. Pekerja	OH	0.700	124,500.00	87,150.00
	2. Tukang besi	OH	0.700	140,000.00	98,000.00
	3. Kepala Tukang	OH	0.070	163,000.00	11,410.00
	4. Mandor	OH	0.070	142,500.00	9,975.00
II	Bahan.				
	1. Besi beton (polos/ulir)	kg	105.00	18,000.00	1,890,000.00
	2. Kawat ikat	kg	1.50	16,250.00	24,375.00
III.	Alat				
IV.	**Sub Total**				**2,120,910.00**
V.	**Biaya tidak langsung (overhead)**	%	**15.00**		**318,136.50**
VI	**Harga Satuan Pekerjaan per : m3**				**2,439,046.50**

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - B.17.b
Uraian Pekerjaan : Pembesian 100 kg dengan besi polos/ulir (Pembesian Kolom, Balok, Ring Balk, dan Sloof)
Harga Satuan : Rp. 2,799,468.00 / 100 kg
Harga Satuan : Rp. 27,994.68 / kg

OKE

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga.				
	1. Pekerja	OH	2.100	124,500.00	261,450.00
	2. Tukang besi	OH	1.400	140,000.00	196,000.00
	3. Kepala Tukang	OH	0.140	163,000.00	22,820.00
	4. Mandor	OH	0.210	142,500.00	29,925.00
II	Bahan.				
	1. Besi beton (polos/ulir)	kg	105.00	18,000.00	1,890,000.00
	2. Kawat ikat	kg	2.10	16,250.00	34,125.00
III.	Alat				
IV.	**Sub Total**				**2,434,320.00**
V.	**Biaya tidak langsung (overhead)**	%	**15.00**		**365,148.00**
VI	**Harga Satuan Pekerjaan per : 100 kg**				**2,799,468.00**
VII	**Harga Satuan Pekerjaan per : kg**				**27,994.68**

Nama Proyek	:	Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa	:	PERMEN NO.28/PRT/M/2016 - B.17.c1
Uraian Pekerjaan	:	Pembesian 100 kg jaring kawat (Wiremesh M7) untuk pelat atau dinding
Harga Satuan	:	Rp. 1,908,338.11 / 100 kg
Harga Satuan	:	Rp. 19,083.38 / kg

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga.				
	1. Pekerja	OH	0.250	124,500.00	31,125.00
	2. Tukang besi	OH	0.250	140,000.00	35,000.00
	3. Kepala Tukang	OH	0.025	163,000.00	4,075.00
	4. Mandor	OH	0.025	147,500.00	3,687.50
II	Bahan.				
	1. Wiremesh 7 mm	kg	102.00	15,466.05	1,577,536.95
	2. Kawat ikat	kg	0.50	16,250.00	8,125.00
III.	Alat				
IV.	Sub Total				1,659,424.45
V.	Biaya tidak langsung (overhead)	%	15.00		248,913.67
VI	Harga Satuan Pekerjaan per : 100 kg				1,908,338.11
VII	Harga Satuan Pekerjaan per : kg				19,083.38

Nama Proyek	:	Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa	:	PERMEN NO.28/PRT/M/2016 - B.17.c1
Uraian Pekerjaan	:	Pembesian 100 kg jaring kawat (Wiremesh M10) untuk pelat atau dinding
Harga Satuan	:	Rp. 2,361,879.99 / 100 kg
Harga Satuan	:	Rp. 23,618.80 / kg

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga.				
	1. Pekerja	OH	0.250	124,500.00	31,125.00
	2. Tukang besi	OH	0.250	140,000.00	35,000.00
	3. Kepala Tukang	OH	0.025	163,000.00	4,075.00
	4. Mandor	OH	0.025	147,500.00	3,687.50
II	Bahan.				
	1. Wiremesh 10 mm	kg	102.00	19,392.56	1,979,521.18
	2. Kawat ikat	kg	0.50	16,250.00	8,125.00
III.	Alat				
IV.	Sub Total				2,053,808.68
V.	Biaya tidak langsung (overhead)	%	15.00		308,071.30
VI	Harga Satuan Pekerjaan per : 100 kg				2,361,879.99
VII	Harga Satuan Pekerjaan per : kg				23,618.80

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - B.21.b
Uraian Pekerjaan : 1 m2 Bekisting Lantai Beton Biasa dengan multiflex 12 mm atau 18 mm
Harga Satuan : Rp. 105,367.60 / m2

OKE

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga.				
	1. Pekerja	OH	0.200	124,500.00	24,900.00
	2. Tukang kayu	OH	0.100	140,000.00	14,000.00
	3. Kepala Tukang	OH	0.010	163,000.00	1,630.00
	4. Mandor	OH	0.020	142,500.00	2,850.00
II	Bahan.				
	1. Multiflex 12 mm atau 18 mm	lembar	0.128	135,900.00	17,394.00
	2. Kaso 5/7 cm	m3	0.005	3,700,000.00	18,500.00
	3. Paku 5 cm dan 7cm	kg	0.220	20,000.00	4,400.00
	4. Minyak bekisting	liter	0.200	40,000.00	8,000.00
III.	Alat				
IV.	Sub Total				91,624.00
V.	Biaya tidak langsung (overhead)	%	15.00		13,743.60
VI	Harga Satuan Pekerjaan per : m2				105,367.60

Nama Proyek : Pekerjaan Rehabilitasi Daerah Irigasi Saddang
Analisa : PERMEN NO.28/PRT/M/2016 - B.26.b
Uraian Pekerjaan : 1 m2 Bekisting Pondasi dan Sloof Beton Biasa menggunakan papan 3/20 cm
Harga Satuan : Rp. 228,677.50 / m2

OKE

No.	Macam Pekerjaan	Satuan	Koefisien	Harga Sat. (Rp.)	Jumlah Harga (Rp.)
I	Tenaga.				
	1. Pekerja	OH	0.300	200,000.00	60,000.00
	2. Tukang kayu	OH	0.150	212,500.00	31,875.00
	3. Kepala Tukang	OH	0.015	225,000.00	3,375.00
	4. Mandor	OH	0.030	150,000.00	4,500.00
II	Bahan.				
	1. Papan 3/20 cm kayu kelas II	m3	0.014	3,700,000.00	51,800.00
	2. Kaso 5/7 cm	m3	0.009	3,700,000.00	33,300.00
	3. Paku 5 cm dan 7 cm	kg	0.300	20,000.00	6,000.00
	4. Minyak bekisting	liter	0.200	40,000.00	8,000.00
III.	Alat				
IV.	Sub Total				198,850.00
V.	Biaya tidak langsung (overhead)	%	15.00		29,827.50
VI	Harga Satuan Pekerjaan per : m2				228,677.50

4. ANALISA PEKERJAAN PINTU

Fix.Wheel Gate - B 2.40 m x H 2.75 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/Unit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	2.40	2.75	0.12	621.72	kg	1	36.000	22,381,920
2	Top Frame	UNP - 200	2.64			64.94	kg	1	36.000	2,337,984
3	Middle Beam	UNP - 200	2.64			64.94	Kg	3	36.000	7,013,952
4	Side Beam	UNP - 200		2.75		67.65	kg	2	36.000	4,873,800
5	Stiffener	MS - Plate	0.35	2.75	0.1	75.56	kg	6	36.000	16,323,150
6	Vertical Beam		0.35	2.75	0.1	37.78	kg	6	36.000	8,163,075
7	Lifting lug					6.22	kg	2	36.000	447,836
8	Main Wheel	S45C				23.31	kg	4	29.100	2,713,806
9	Side Roller					0.00	kg	0	50.000	0
10	Seal						m	10	2,000,000	20,000,000
11	Bottom Frame	IWF - 200	2.76			84.46	kg	1	36.000	3,040,416
12	Bottom Seal Plate	SUS 304	2.64	0.10	0.06	13.86	kg	1	85.000	1,178,100
13	Side Frame	UNP - 200	3.04			169.13	kg	2	36.000	12,177,000
14	Side Seal Plate	SUS 304	0.35	0.10	0.06	28.88	kg	2	85.000	4,908,750
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					2.50	m	2	3,500,000	17,500,000
18	Connecting Shaft					1.80	m	1	2,500,000	4,500,000
19	Chain Coupling						Pcs	2	2,800,000	5,600,000
20	Lifting Gear						Pcs	2	69,430,000	138,860,000
21	Actuator						Pcs	1	135,000,000	135,000,000
22	Local Control Panel						Lot	1	65,000,000	65,000,000
									Sub Total - A	465,610,593
24	Installation						Lot	1	32,592,742	32,592,742
25	Transportation						Lot	1	37,248,847	37,248,847
26	Others						Lot	1	93,122,119	93,122,119
									Sub Total - B	162,963,708
									Total	628,574,301
									Profit - 10%	62,857,430
									Total Prices	691,431,731

Slide Gate - B 0.40 m x 0.50 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	0.40	0.50	0.08	12.56	kg	1	36,000	452,160
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stifenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L75x75x8	0.60			6.00	kg	1	36,000	216,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	1.00			10.00	kg	2	36,000	360,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					1.00	m	1	3,500,000	3,500,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	25,151,010
24	Installation						Lot	1	1,760,571	1,760,571
25	Transportation						Lot	1	2,012,081	2,012,081
26	Others						Lot	1	5,030,202	5,030,202
									Sub Total - B	8,802,854
									Total	33,953,864
									Profit - 10%	3,395,386
									Total Prices	37,349,250

Slide Gate - B 0.40 m x 0.60 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	0.40	0.60	0.08	15.07	kg	1	36,000	542,592
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stiffenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L75x75x8	0.60			6.00	kg	1	36,000	216,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	1.20			12.00	kg	2	36,000	432,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					1.20	m	1	3,500,000	4,200,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	26,013,442
24	Installation						Lot	1	1,820,941	1,820,941
25	Transportation						Lot	1	2,081,075	2,081,075
26	Others						Lot	1	5,202,688	5,202,688
									Sub Total - B	9,104,705
									Total	35,118,147
									Profit - 10%	3,511,815
									Total Prices	38,629,961

Slide Gate - B 0.40 m x 0.90 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	0.40	0.90	0.08	22.67	kg	1	36,000	816,888
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stifenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L75x75x8	0.60			6.00	kg	1	36,000	216,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	1.60			18.00	kg	2	36,000	648,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					1.80	m	1	3,500,000	6,300,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	28,600,738
24	Installation						Lot	1	2,002,052	2,002,052
25	Transportation						Lot	1	2,288,059	2,288,059
26	Others						Lot	1	5,720,148	5,720,148
									Sub Total - B	10,010,258
									Total	38,610,996
									Profit - 10%	3,861,100
									Total Prices	42,472,096

Slide Gate - B 0.50 m x 0.50 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	0.50	0.50	0.08	15.70	kg	1	55,000	863,200
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stifenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L75x75x8	0.70			7.00	kg	1	36,000	252,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	1.00			10.00	kg	2	36,000	360,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					1.00	m	1	3,500,000	3,500,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	25,300,050
24	Installation						Lot	1	1,771,004	1,771,004
25	Transportation						Lot	1	2,024,004	2,024,004
26	Others						Lot	1	5,060,010	5,060,010
									Sub Total - B	8,855,018
									Total	34,155,068
									Profit - 10%	3,415,507
									Total Prices	37,570,574

Slide Gate - B 0.50 m x 0.70 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	0.50	0.70	0.08	21.98	kg	1	66,000	797,280
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stiffenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L75x75x8	0.70			7.00	kg	1	36,000	252,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	1.40			14.00	kg	2	36,000	504,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					1.40	m	1	3,500,000	4,900,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	27,070,130
24	Installation						Lot	1	1,894,909	1,894,909
25	Transportation						Lot	1	2,165,610	2,165,610
26	Others						Lot	1	5,414,026	5,414,026
									Sub Total - B	9,474,546
									Total	36,544,676
									Profit - 10%	3,654,468
									Total Prices	40,199,143

Slide Gate - B 0.50 m x 0.80 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	0.50	0.80	0.08	25.12	kg	1	36,000	904,320
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stifenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L75x75x8	0.70			7.00	kg	1	36,000	252,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	1.60			16.00	kg	2	36,000	576,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					1.60	m	1	3,500,000	5,600,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	27,955,170
24	Installation						Lot	1	1,956,862	1,956,862
25	Transportation						Lot	1	2,236,414	2,236,414
26	Others						Lot	1	5,591,034	5,591,034
									Sub Total - B	9,784,310
									Total	37,739,480
									Profit - 10%	3,773,948
									Total Prices	41,513,427

Slide Gate - B 0.50 m x 1.20 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	0.50	1.20	0.08	37.68	kg	1	36,000	1,356,480
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stifenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L75x75x8	0.70			7.00	kg	1	36,000	252,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	2.40			24.00	kg	2	36,000	864,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					2.40	m	1	3,500,000	8,400,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	31,495,330
24	Installation						Lot	1	2,204,673	2,204,673
25	Transportation						Lot	1	2,519,626	2,519,626
26	Others						Lot	1	6,299,066	6,299,066
									Sub Total - B	11,023,366
									Total	42,518,696
									Profit - 10%	4,251,870
									Total Prices	46,770,565

Slide Gate - B 0.60 m x 0.40 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	0.60	0.40	0.08	15.07	kg	1	36,000	542,592
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stifenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L75x75x8	0.60			8.00	kg	1	36,000	288,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	0.60			8.00	kg	2	36,000	288,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					0.80	m	1	3,500,000	2,800,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	24,541,442
24	Installation						Lot	1	1,717,901	1,717,901
25	Transportation						Lot	1	1,983,315	1,983,315
26	Others						Lot	1	4,908,288	4,908,288
									Sub Total - B	8,589,505
									Total	33,130,947
									Profit - 10%	3,313,095
									Total Prices	36,444,041

Slide Gate - B 0.60 m x 0.70 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	0.60	0.70	0.08	26.39	kg	1	36,000	949,546
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stiffenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L75x75x8	0.60			8.00	kg	1	36,000	288,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	1.40			14.00	kg	2	36,000	504,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					1.40	m	1	3,500,000	4,900,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	27,264,386
24	Installation						Lot	1	1,908,507	1,908,507
25	Transportation						Lot	1	2,181,151	2,181,151
26	Others						Lot	1	5,452,877	5,452,877
									Sub Total - B	9,542,535
									Total	36,806,921
									Profit - 10%	3,680,692
									Total Prices	40,487,613

Slide Gate - B 0.60 m x 0.80 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	0.60	0.80	0.08	30.14	kg	1	36,000	1,085,184
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stifenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L75x75x8	0.60			8.00	kg	1	36,000	288,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	1.60			16.00	kg	2	36,000	576,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					1.60	m	1	3,500,000	5,600,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	28,172,034
24	Installation						Lot	1	1,972,042	1,972,042
25	Transportation						Lot	1	2,253,763	2,253,763
26	Others						Lot	1	5,634,407	5,634,407
									Sub Total - B	9,860,212
									Total	38,032,246
									Profit - 10%	3,803,225
									Total Prices	41,835,470

Slide Gate - B 0.60 m x 0.95 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	0.60	0.95	0.08	35.80	kg	1	36,000	1,288,656
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stifenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L 75x75x8	0.60			8.00	kg	1	36,000	288,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	1.90			19.00	kg	2	36,000	684,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					1.90	m	1	3,500,000	6,650,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	29,533,506
24	Installation						Lot	1	2,087,345	2,087,345
25	Transportation						Lot	1	2,362,680	2,362,680
26	Others						Lot	1	5,906,701	5,906,701
									Sub Total - B	10,336,727
									Total	39,870,233
									Profit - 10%	3,987,023
									Total Prices	43,857,256

Slide Gate - B 0.60 m x 1.15 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	0.60	1.15	0.08	43.33	kg	1	36,000	1,559,952
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stifenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L 75x75x8	0.60			8.00	kg	1	36,000	288,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	2.30			23.00	kg	2	36,000	828,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					2.50	m	1	3,500,000	8,050,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	31,348,802
24	Installation						Lot	1	2,194,416	2,194,416
25	Transportation						Lot	1	2,507,904	2,507,904
26	Others						Lot	1	6,269,760	6,269,760
									Sub Total - B	10,972,081
									Total	42,320,883
									Profit - 10%	4,232,088
									Total Prices	46,552,971

Slide Gate - B 0.70 m x 0.50 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	0.70	0.50	0.08	21.98	kg	1	36,000	791,280
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stiffenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L75x75x8	0.90			9.00	kg	1	36,000	324,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	1.00			10.00	kg	2	36,000	360,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					1.00	m	1	3,500,000	3,500,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	25,598,130
24	Installation						Lot	1	1,791,869	1,791,869
25	Transportation						Lot	1	2,047,850	2,047,850
26	Others						Lot	1	5,119,626	5,119,626
									Sub Total - B	8,959,346
									Total	34,557,476
									Profit - 10%	3,455,748
									Total Prices	38,013,223

Slide Gate - B 0.80 m x 0.6 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	0.80	0.60	0.08	30.14	kg	1	36,000	1,085,184
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stifenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L75x75x8	1.00			10.00	kg	1	36,000	360,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	1.20			12.00	kg	2	36,000	432,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					1.20	m	1	3,500,000	4,200,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	26,700,034
24	Installation						Lot	1	1,889,002	1,889,002
25	Transportation						Lot	1	2,136,003	2,136,003
26	Others						Lot	1	5,340,007	5,340,007
									Sub Total - B	9,345,012
									Total	36,045,046
									Profit - 10%	3,604,505
									Total Prices	39,649,550

Slide Gate - B 0.80 m x 0.85 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	0.80	0.85	0.08	42.70	kg	1	36,000	1,537,344
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stifenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L75x75x8	1.00			10.00	kg	1	36,000	360,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	1.70			17.00	kg	2	36,000	612,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					1.70	m	1	3,500,000	5,950,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	29,082,194
24	Installation						Lot	1	2,035,754	2,035,754
25	Transportation						Lot	1	2,328,576	2,328,576
26	Others						Lot	1	5,816,439	5,816,439
									Sub Total - B	10,178,768
									Total	39,260,962
									Profit - 10%	3,926,096
									Total Prices	43,187,058

Slide Gate - B 0.80 m x 1.00 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	0.50	1.00	0.08	31.40	kg	1	36,000	1,130,400
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stifenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L75x75x8	0.70			7.00	kg	1	36,000	252,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	2.00			20.00	kg	2	36,000	720,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					2.00	m	1	3,500,000	7,000,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	29,725,250
24	Installation						Lot	1	2,080,768	2,080,768
25	Transportation						Lot	1	2,378,020	2,378,020
26	Others						Lot	1	5,945,050	5,945,050
									Sub Total - B	10,403,838
									Total	40,129,088
									Profit - 10%	4,012,909
									Total Prices	44,141,996

Slide Gate - B 0.90 m x 0.60m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	0.90	0.60	0.08	33.91	kg	1	36,000	1,220,847
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stifenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L 75x75x8	1.10			11.00	kg	1	36,000	396,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	1.20			12.00	kg	2	36,000	432,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					1.20	m	1	3,500,000	4,200,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	26,871,682
24	Installation						Lot	1	1,881,018	1,881,018
25	Transportation						Lot	1	2,149,735	2,149,735
26	Others						Lot	1	5,374,336	5,374,336
									Sub Total - B	9,405,089
									Total	36,276,771
									Profit - 10%	3,627,677
									Total Prices	39,904,448

Slide Gate - B 0.95 m x 0.65 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	0.95	0.65	0.08	38.79	kg	1	36,000	1,396,044
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stiffenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L75x75x8	1.15			11.50	kg	1	36,000	414,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	1.30			13.00	kg	2	36,000	468,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					1.50	m	1	3,900,000	4,550,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	27,450,894
24	Installation						Lot	1	1,921,563	1,921,563
25	Transportation						Lot	1	2,196,072	2,196,072
26	Others						Lot	1	5,490,179	5,490,179
									Sub Total - B	9,607,813
									Total	37,058,707
									Profit - 10%	3,705,871
									Total Prices	40,764,578

Slide Gate - B 1.00 m x 1.00 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	1.00	1.00	0.08	62.80	kg	1	36,000	2,260,800
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stifenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L75x75x8	1.20			12.00	kg	1	36,000	432,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	2.00			20.00	kg	2	36,000	720,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					2.00	m	1	3,500,000	7,000,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	31,035,650
24	Installation						Lot	1	2,172,496	2,172,496
25	Transportation						Lot	1	2,482,852	2,482,852
26	Others						Lot	1	6,207,130	6,207,130
									Sub Total - B	10,862,478
									Total	41,898,128
									Profit - 10%	4,189,813
									Total Prices	46,087,940

Slide Gate - B 1.30 m x 1.70 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	1.30	1.70	0.08	138.79	kg	1	36,000	4,996,368
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stiffenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L75x75x8	1.50			15.00	kg	1	36,000	540,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	3.40			34.00	kg	2	36,000	1,224,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					3.40	m	1	3,500,000	11,900,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	39,283,218
24	Installation						Lot	1	2,749,825	2,749,825
25	Transportation						Lot	1	3,142,657	3,142,657
26	Others						Lot	1	7,856,644	7,856,644
									Sub Total - B	13,749,126
									Total	53,032,344
									Profit - 10%	5,303,234
									Total Prices	58,335,579

Slide Gate - B 1.60 m x 1.60 m

No.	Description	Material	Dimension			Weight	Unit	Qty	Cost/cUnit	Prices
			B	H	T					
1	Skin Plate / Gate Leaf	MS - Plate	1.60	1.60	0.08	160.77	kg	1	36,000	5,787,648
2	Top Frame						kg			
3	Middle Beam						Kg			
4	Side Beam						kg			
5	Stifenner						kg			
6	Vertical Beam						kg			
7	Lifting lug	MS - Plate			0.08	5.00	kg	1	36,000	180,000
8	Main Wheel						kg			
9	Side Roller						kg			
10	Seal						m			
11	Bottom Frame	L75x75x8	1.60			18.00	kg	1	36,000	648,000
12	Bottom Seal Plate						kg			
13	Side Frame	L75x75x8	3.20			32.00	kg	2	36,000	1,152,000
14	Side Seal Plate						kg			
15	Lintel Beam						kg			
16	Lintel Seal Plate						kg			
17	Lifting Spindle					3.20	m	1	3,500,000	11,200,000
18	Connecting Shaft						m			
19	Chain Coupling						Pcs			
20	Lifting Gear						Pcs	1	20,442,850	20,442,850
21	Actuator						Pcs			
22	Local Control Panel						Lot			
									Sub Total - A	39,410,498
24	Installation						Lot	1	2,758,735	2,758,735
25	Transportation						Lot	1	3,152,840	3,152,840
26	Others						Lot	1	7,882,100	7,882,100
									Sub Total - B	13,793,674
									Total	53,204,172
									Profit - 10%	5,320,417
									Total Prices	58,524,590

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]				
[illegible]	[illegible]				
[illegible]	[illegible]				

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]				
[illegible]	[illegible]				[illegible]
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]				[illegible]

REKAP VOLUME PEKERJAAN SALURAN UPTD SADDANG WAJO

No	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

PERHITUNGAN VOLUME PEKERJAAN SALURAN SEKUNDER BELAWA HILIR

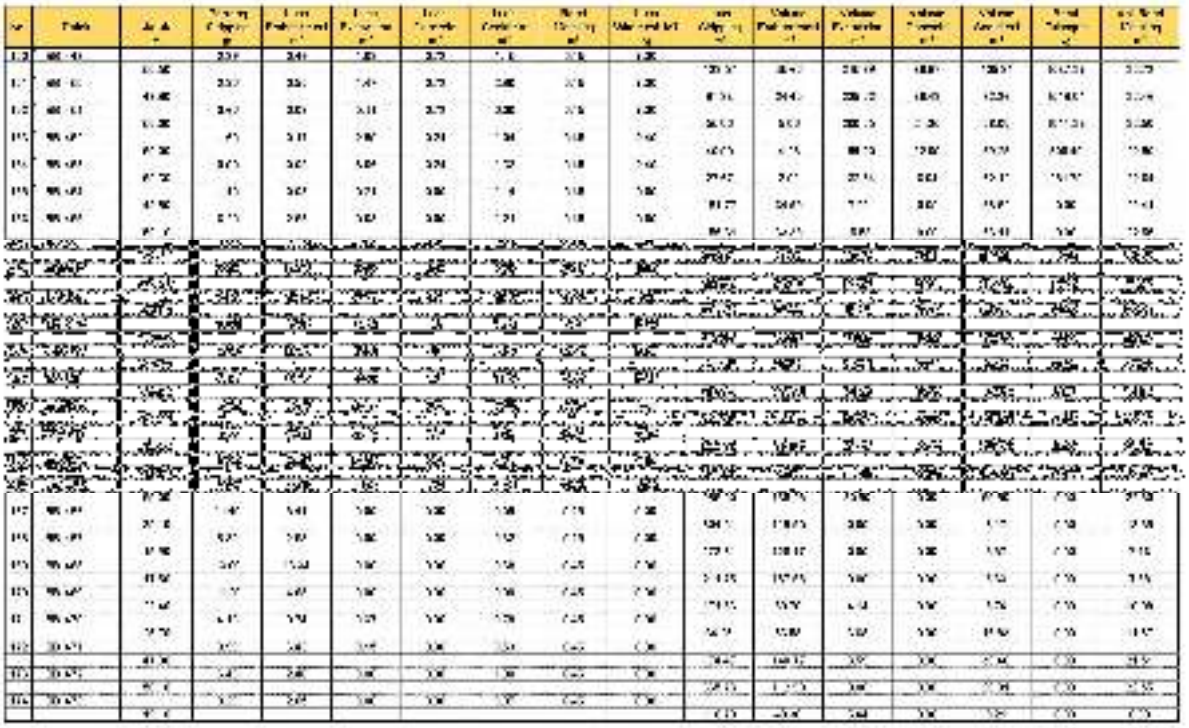
3. Perhitungan Volume Saluran Sekunder Belawa Hilir

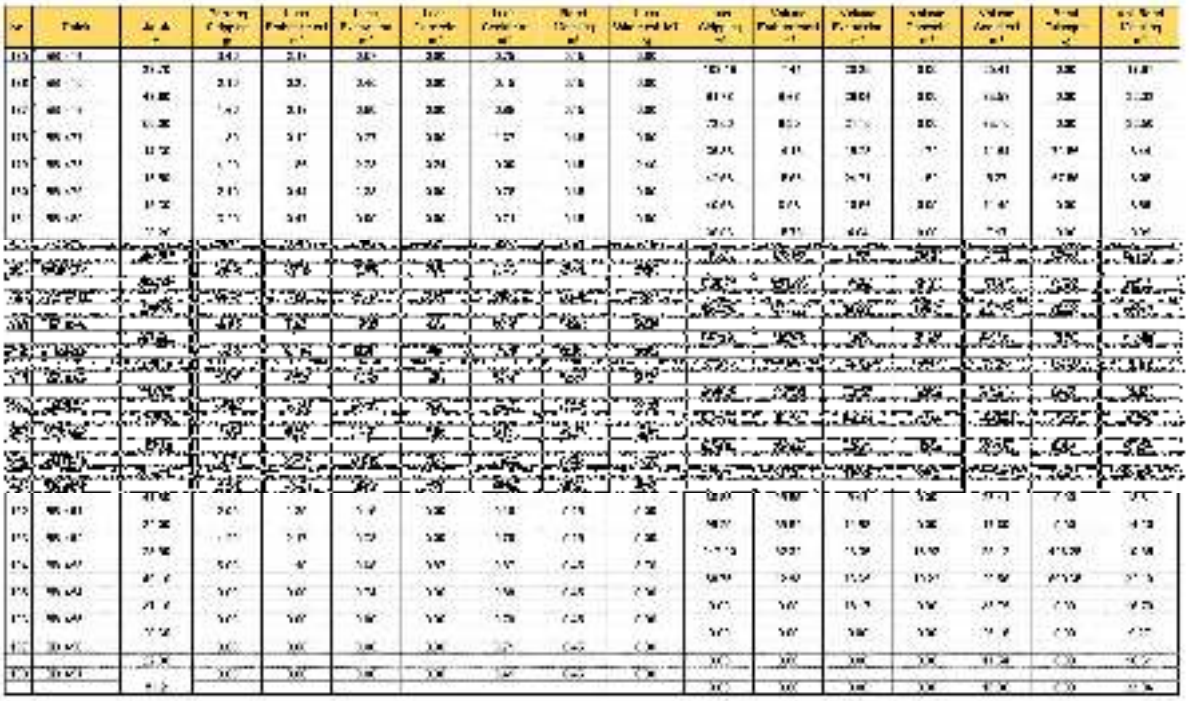
No.	Nama	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
11	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
13	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
14	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
15	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
18	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
19	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

No.	Nama	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
22	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
23	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
24	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
25	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
26	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
27	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
28	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
29	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
30	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
31	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
32	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
33	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
34	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
35	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
36	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
37	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
38	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
40	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
41	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
42	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
43	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
44	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
45	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]





[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

PERHITUNGAN VOLUME PEKERJAAN BANGUNAN SALURAN SEKUNDER BEIAWA HILIR

PERHITUNGAN VOLUME PEKERJAAN SALURAN SEKUNDER MACERO

1. Perhitungan Volume Saluran Sekunder Masum

No	Date	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]							
2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]								[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]							
		[illegible]								[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]							
		[illegible]								[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]								[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]								[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]								[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
11	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]								[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]								[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
13	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]								[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
14	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]								[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
15	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]								[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]								[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]								[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
18	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]								[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
19	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]								[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]								[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

No.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

4 REHABILITATION OF DRAINAGE CANALS AND STRUCTURES

4.1 Existing Drainage Conditions

08. SP Saddang Wajo Drain Channels serve and receive discharge from Padi Field Tertiary Block. These drains originate in the irrigation area. Several natural drainage channels (rivers and streams) pass through the irrigation system area of which the main ones are:

- Massila River in the UPTD Pekkabata Unit
- Arasie River in the UPTD Rappang Unit
- Rappang River in the UPTD Rappang Unit
- Cellie River in the UPTD Rappang Unit
- Mojong River in the UPTD Belawa Unit

09. Other rivers originate in the irrigation area:

- Sawitto River in the UPTD Sawitto Unit
- Kariango River in the UPTDTiroang Unit
- Sidenreng River in the UPTD Sidenreng Unit
- Tiroang River in the UPTD Tiroang Unit

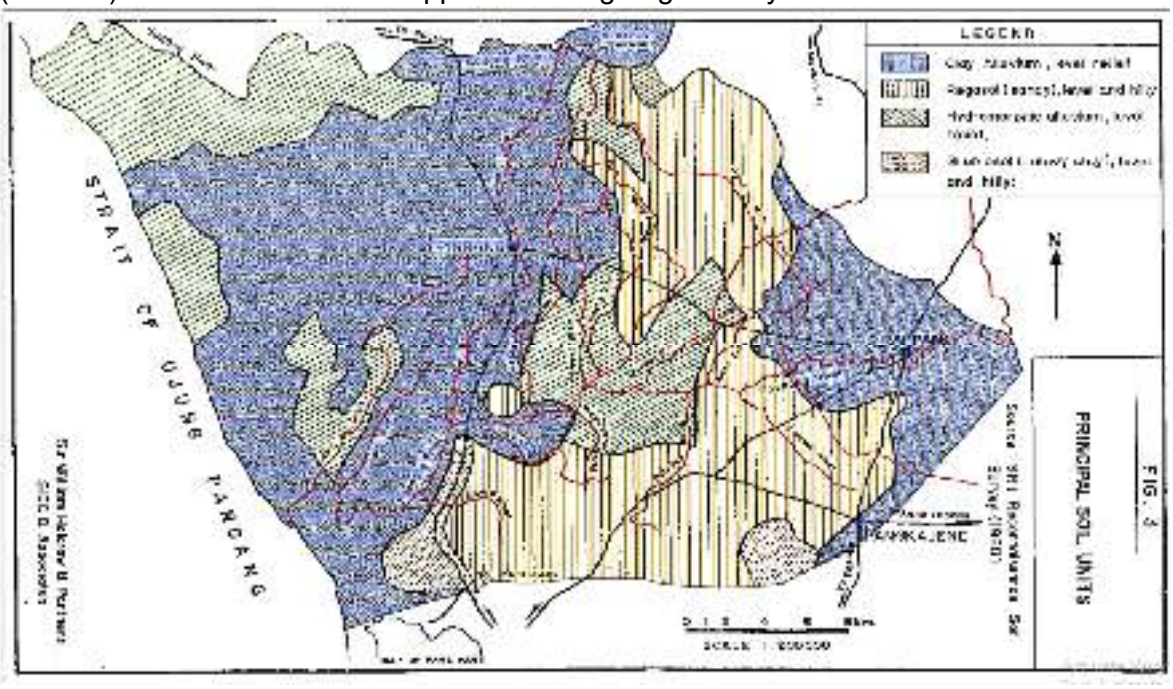
10. Table below lists the main and secondary drains in the UPTD Saddang Wajo Unit Irrigation System Administration Boundaries. The numbers following some of the stream names refer to the structure numbering of the irrigation canals and drains they cross.

<Table 4.1> List of the Main and Secondary the UPTD Saddang Wajo Unit Drains

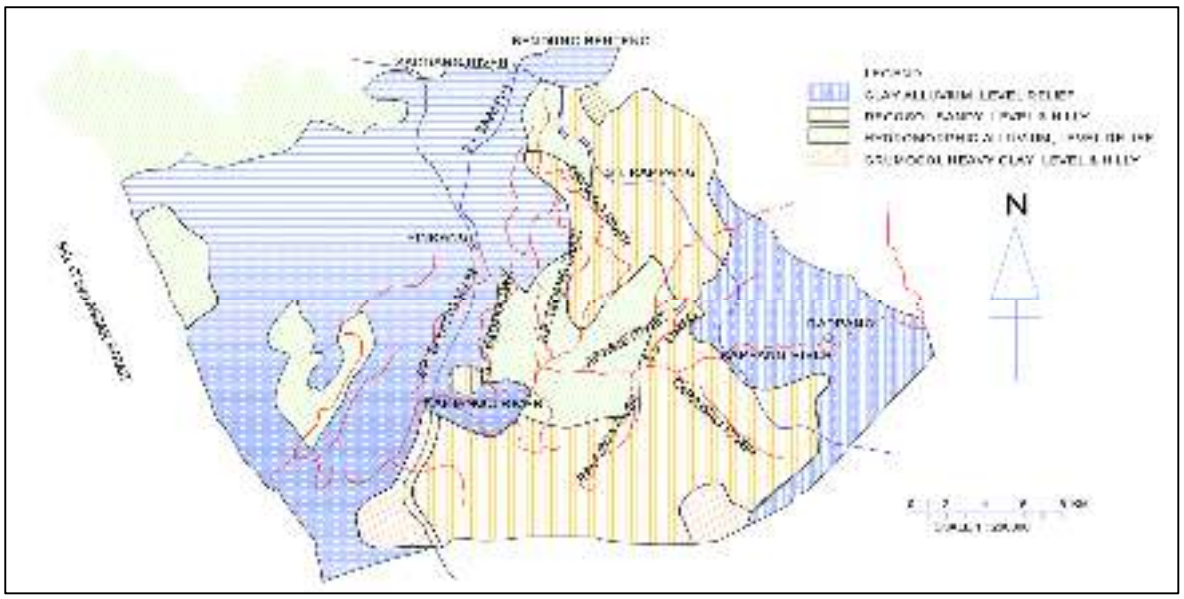
Item No	Name	Length (km)
A	**MAIN DRAINS**	
1	SP. Padonge	8.60
TOTAL MAIN DRAINS		8.60

Note: S.P. *('saluran pembuang')* = drain

11. Figure below shows top soil classification related to natural river and manmade (artificial) constructed drain to support Saddang Irrigation System.



<Figure 4.1> Soil Classification Related to Natural River and Constructed Drain (Ref)



<Figure 4.2> Soil Classification Related to Natural River and Constructed Drain

4.2 Present Condition and Issues of Drain Channels

Secondary Drains

12. Issues are (i) much sedimentation in drains, (ii) extensive growth of wild grasses that disrupt the flow capacity (iii) no farm roads available on either of the embankments (iv) troubles with accessibility to and from irrigation unit areas as few footbridges.

13. Present conditions of Surveyed UPTD Saddang Wajo are shown on **Photos 1** to **4.**

Photo 1: Surveyed Saddang Wajo (UPTD Saddang Wajo unit)

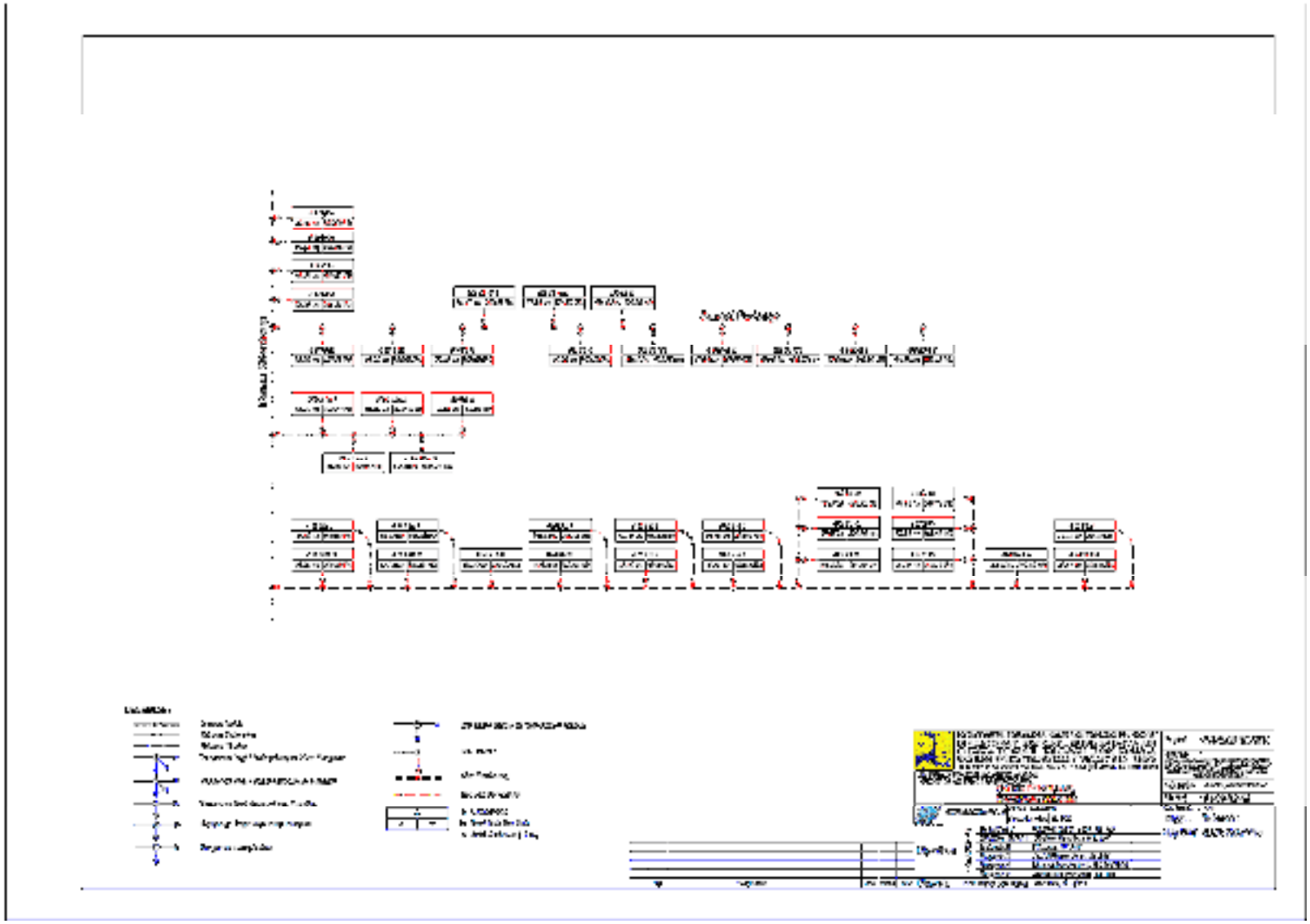
Photo 1: Surveyed Saddang Wajo (Saddang Wajo UPTD unit)

Photo 3: Surveyed Saddang Wajo (UPTD Saddang Wajo unit)

Photo 4: Surveyed Saddang Wajo (UPTD Saddang Wajo Unit)

4.2.1 Establishment a Drainage Schematic System

14. A drainage schematic system is defined as a picture that shows something in a simple way, using symbols, that represents the components of each drain unit, the catchment area, modulus drainage and design discharge for 5-year return period. Schematic diagrams only depict the significant components of a system, though some details in the diagram may also be exaggerated or introduced to facilitate the understanding of the system. Schematic diagrams do not include details that are not necessary for comprehending the information that the diagram was intended to convey.



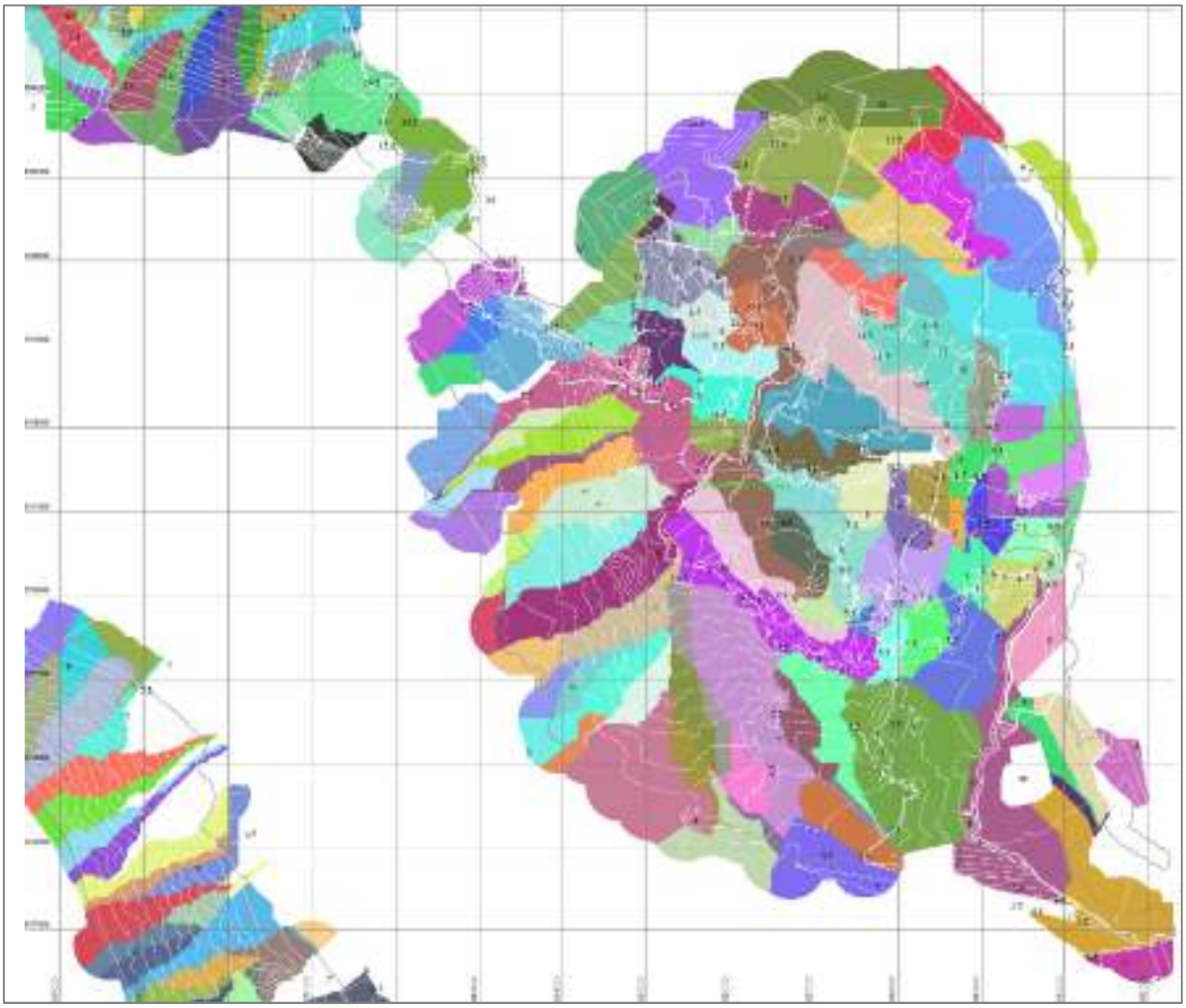
<Figure 4.3> Drainage Scheme – Saddang Wajo

4.3 Catchment Area

Rainfall Catchment Area

15. The rainfall catchment area criteria given in the Indonesian Irrigation Design Standards are related to land use rainfall runoff coefficients.

16. Figure below shows Rainfall Catchment area of UPTD Saddang Wajo Unit. Each coloured polygon represents the farm-land and non-farming area in km2 (100 hectares) and stream line (in blue color).



<Figure 4.4> Rainfall Catchment area of UPTD Saddang Wajo Unit

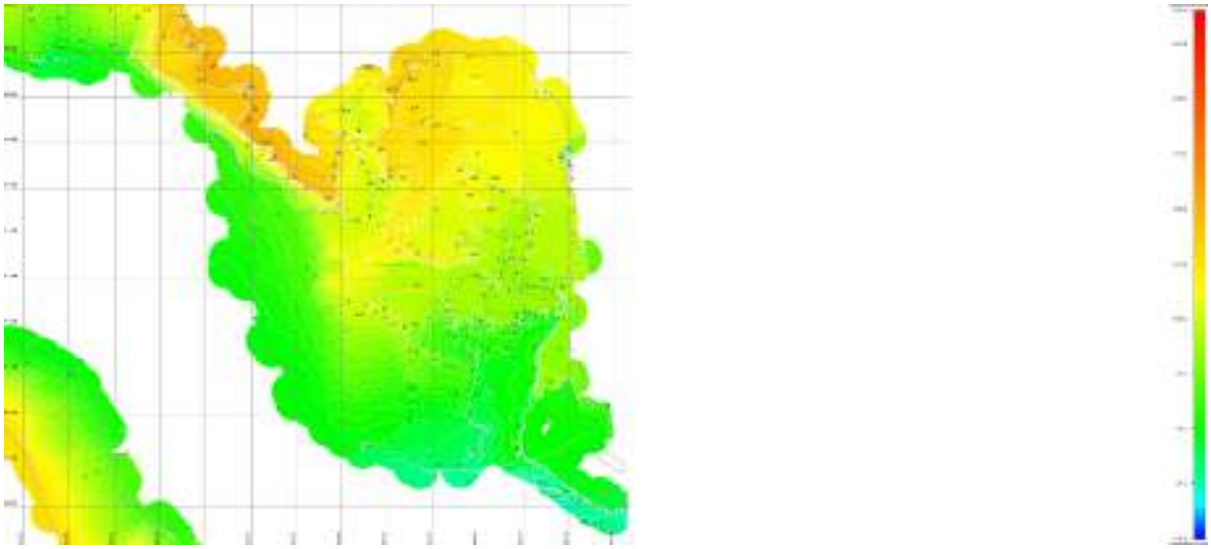
4.4 Topography and Drain Elevation

17. SP Saddang Wajo Drain and SP AK1 Drain Cross and Long sections are terestris surveyed. Padi Field Tertiary Block are reconstructed from Intermap Sattelite Images and Ground Control points. Elevation Contours and Point Heights are availble for evaluation. No LIDAR Survey in the Saddang Wajo Unit. KP Irrigation System Design Manual requirements forementioned are as follows:

1. Tertiary Irrigation Canal Elevation +10 cm above the nearby Padi Field Tertiary Block Elevation. This elevation difference is to allow water flows into padi field tertiary block.

2. Tertiary Drain Channel Bed Elevation -3 cm below the nearby Padi Field Tertiary Block Elevation. This elevation difference is necessity to allows water discharge to drain channel.
3. Secondary Drain and Natural River Bed Elevation -5 cm below the nearby Padi Field Tertiary Block Elevation. This elevation difference is necessity to allows water discharge to drain channel and natural river.

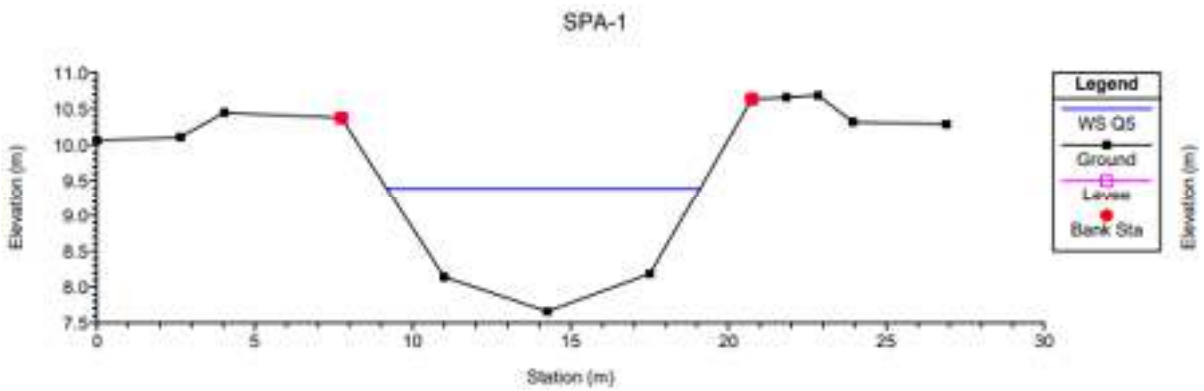
18. Figure below shows the Irrigation canals, padi field tertiary blocks and drain channels in Saddang Wajo UPTD Unit.



<Figure 4.5> Topography of Irrigation Canals, Tertiary blocks and Drains in Saddang Wajo Unit

19. This color range from green (+3.0 m MASL) to red (+12.5 m MASL) bound by elevation contours in grey colour. Along the Saddang Wajo Drainage Channel from Uppermost to Lowermost segment of Surveyed Drain have channel bed elevation 3 cm below the nearby Padi Field Tertiary block, thus fulfill KP requirements.

20. Figure below shows the Saddang Wajo drain long section channel bed (Ground), left (LOB) and right (ROB) embankment indicated in Legend respectively.



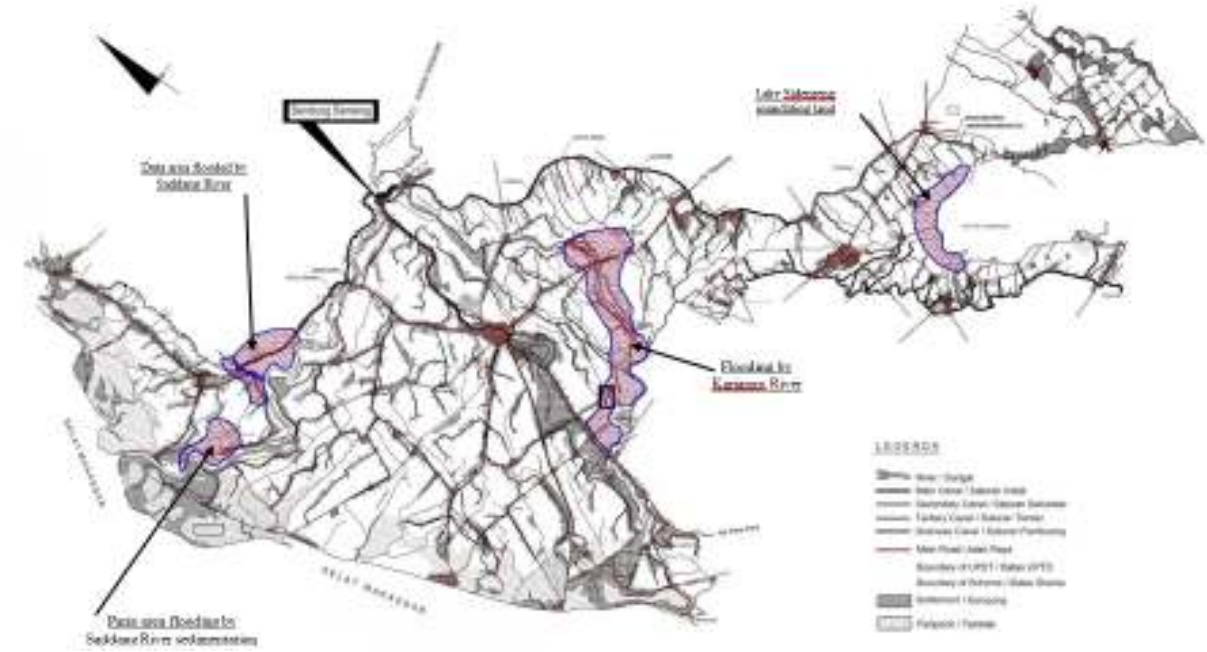
<Figure 4.6> SP Saddang Wajo Drain long section Channel Bed, Left and Right Over Bank Elevation

4.5 Tidal Influence on Drains

Tidal influence in Saddang Wajo UPTD Unit Drains

21. Tidal Constituents and Predicted Tide Elevations are collected from the Badan Informasi Geospasial (BIG). Along the Saddang's Irrigation Coast Tidal condition is Semi Diurnal Type, which means two high and two low water elevation occur in 24 hours. Highest High Spring Tide Water (HHWS) occurs once in 18.6 years. This HHWS Elevation has been evaluated in this report. The designated HWS Elevation is 0.8 m MASL. All drains must have channel bed elevation above 0.8 m MASL to allow all water in the drain, discharge to the sea.

22. Figure below shows long section of the surveyed Saddang Wajo drain, the lowest elevation of channel bed (Ground) is +1.8 m MASL, thus, the Saddang Wajo bed elevation is above HHWS elevation.



<Figure 4.7> Flood-Prone Areas of The Saddang Irrigation System, Indicated by Hatching

4.6 Flood Discharges Design

Discharge design

23. The drainage design criteria given in the Indonesian Irrigation Design Standards are applied as follows:

a) Drainage modulus for farm land (KP-05 'Tertiary Units')
b) 5-year and 25-year discharges from non-farming areas (KP-03 'Canals')

24. The rainfall statistics and analysis are presented in Volume 3 'Water Availability **Report**'. The Saddang Irrigation System has 4 rainfall zones with the Drainage Modulus is shown as follows:

<Table 4.2> Q5 and Q25 Drainage Modulus (Dm) for Maximum 3 Days Rainfall in mm

Drainage module calculations					
Zone		**1**	**2**	**3**	**4**
Eto	mm	3.8	3.8	3.8	4.2
Kc		1.1	1.1	1.1	1.1
Etc	mm	4.2	4.2	4.2	4.7
dS	mm	50.0	50.0	50.0	50.0
n		3.0	3.0	3.0	3.0
I5th	mm	234.1	223.0	200.5	185.6
I25th	mm	284.8	257.0	262.3	242.8
D3 5th	mm	171.4	160.3	137.8	121.6
D3 25th	mm	222.1	194.3	199.6	178.8
Dm 5th	l/sec/ha	6.6	6.2	5.3	4.7
Dm 25th	l/sec/ha	8.6	7.5	7.7	6.9

25. On the maps, the farming and non-farming areas are delineated in the catchments of the drains. The drainage contributions from the farming and non-farming areas are added to obtain the design flows that are contained in the tables of this section per Saddang Irrigartion System unit.

26. Rational Formula applied to calculate non-farming drainage areas is given as follows

$$Q = 0.278\ C.\ I.\ A$$

27. The equation of Dr Mononobe is used to determine the parameter of the rainfall intensity 'I' (in mm/hour):

$$I = R_{24}/24 * (24/t)^{2/3}$$

Where:

C = Land Use Coefficient
A = Sub Catchment Area
I = Rainfall Intensity
R_{24} = maximum 24-hour rainfall of certain return period (mm)
T = duration of the rainfall (hours)

28. The duration of the rainfall t depends on the physical characteristics of the catchment area and is determined using the Kirpich equation (refer KP-03).

29. In total 57 drain channels have been surveyed topographically. The rehabilitation design comprises the following:

- Inspection roads with macadam surfacing will be provided along the secondary drains;
- The capacity will be checked against floods of 5-year return period;
- The flow capacity will be increased to be able to convey 5-year flood flows in case they have lower capacities. The excavated soil material from the capacity enlargement works will be deposited along the drain.
- If the discharge capacity is sufficient, light rehabilitation is proposed such as clearing and grubbing.

30. Table below lists around 13.99 km of surveyed drain and their design discharges.

<Table 4.3> List of Drain Channel and Design Flood

Name	Length (km)	Catchment Area (km²)	Drainage Modulus	Design Flood (m^3/s)	
				5-yrs	25-yrs
UPTD Saddang Wajo					
SP Padonge	8,6	66,55	4,7	3,83	5,39

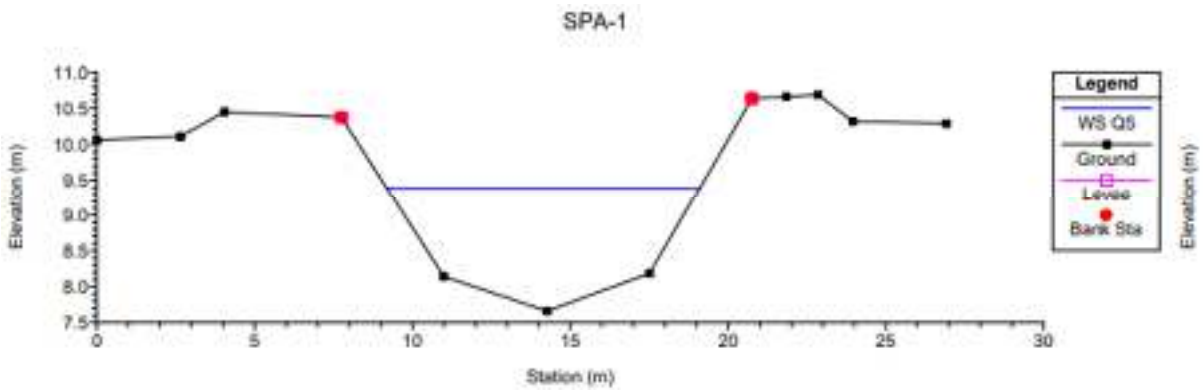
31. **Table 4.2** shows Q5 and Q25 Maximum Discharge of all Catchment Areas of SP Saddang Wajo drain dan SP AK1 drain.

32. **Table 4.3** and **4.4** shows Q5 Maximum Discharge of each Padi Field Tertiary block to SP Saddang Wajo drain dan SP AK1 drain.

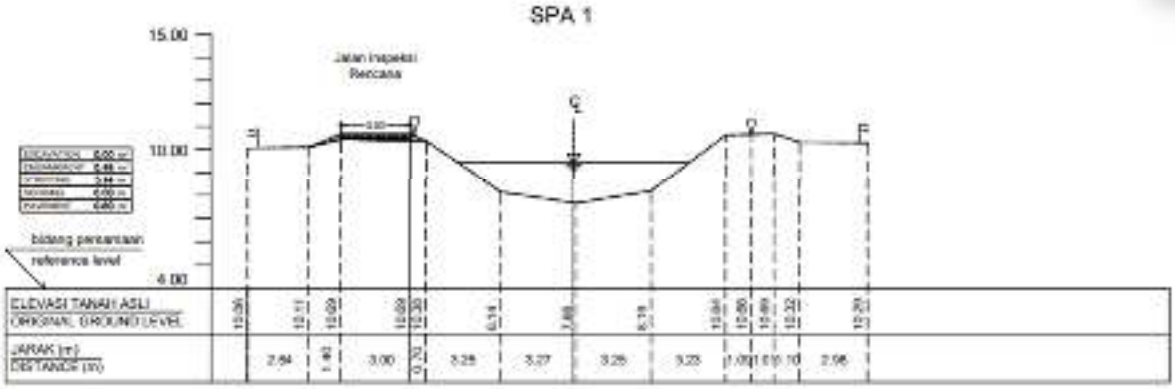
<Table 4.4> List of Tertiary Block and Discharge Saddang Wajo Drain

Sp Belawa			
No	Tertiary Block	Area (Ha)	Discharge Q (L/Dt)
1	d B 19 ka	88.55	0.42
2	d Wt 1 ka	49.92	0.23
3	d Wt 1 ki	77.46	0.36
4	d B 21 ka 1	77.36	0.36
5	d b 21 ka 2	57.86	0.27
6	d b 23 ki	86.93	0.41
7	d b 22 ki	92.21	0.43
8	d b 24 ki 1	49.83	0.23
9	d b 24 ki 2	96.15	0.45
10	d b 24 ki 3	46.44	0.22
11	d b 25 ki 1	28.78	0.14
12	db 25 ki 2	64.91	0.30

33. HEC-RAS Model consist of Geometry generated from Surveyed Cross and Long Section of Sawitto Drain and Q5, Q25 Design Discharge calculated in each reach length to obtain Water Surface Elevation in each Surveyed Cross Sections.



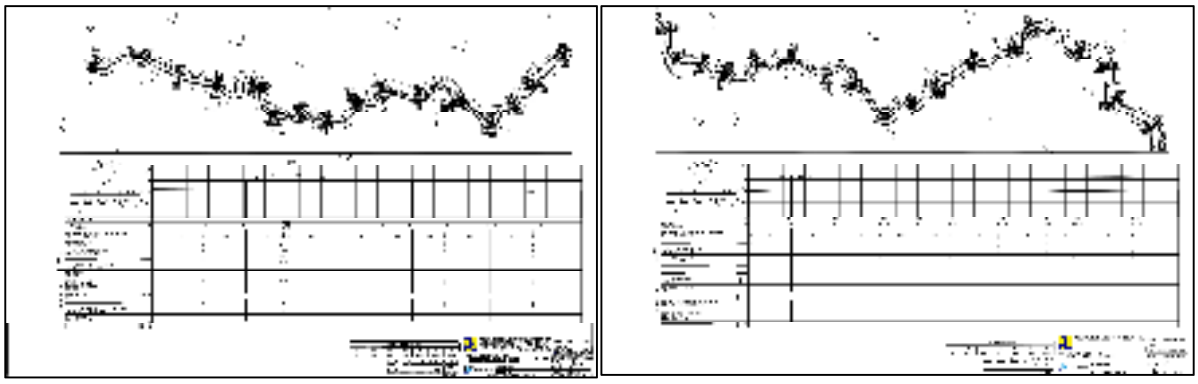
<Figure 4.8> HECRAS Ground, LOB, ROB, Q5, Q25 Water Surface Elevation



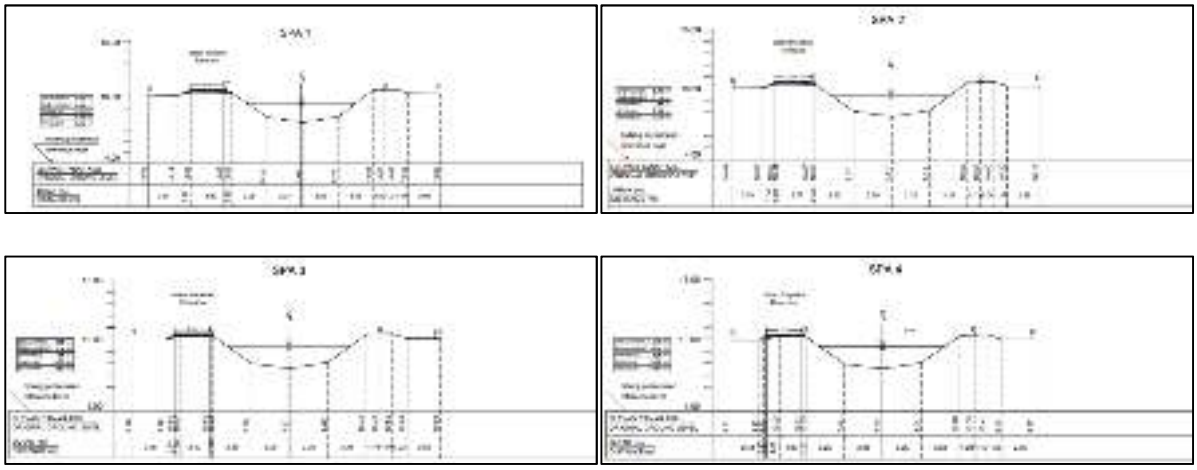
<Figure 4.9> Cross-Section of AK1 26 LOB, ROB, Q5 WS Elevation and Inspection Road

4.7 Rehabilitation of Drainage Canals

34. Figures below shown long and cross of drainage canals, this also provide by detailed of all sections in Appendix 16.



<Figure 4.10> Typical Long Section Saddang Wajo Drainage Canal



<Figure 4.11> Typical Long Section Saddang Wajo Drainage Canal

4.8 Bills of Quantities

35. Based on the calculated volume of dimensions and lengths that have been planned, the following is the calculation of the Bills of Quantities of the work to be carried out such as embankment work, stripping work and road inspection work with macadam and peg construction. The following is a resume of all civil works for the drainage at UPTD Saddang Wajo.

No	Saluran	Length (m)	Inspection Road (m2)	Stripping (m2)	Embankment (m3)	Patok Hm (Units)	Patok Km (Units)	Patok Sempadan (Units)
1	Padonge	8600,23	25800,69	25800,69	32,304.76	86	8	43

1. Drain Cut and Fill Work

36. The planned embankment work is to construct a levee beside the channel lip with planning guard height based on KP-03 Irrigation. The 9.9 km Saddang Wajo channel is 32,304 m3 and the 8.3 km AK 1 channel is 17,157 m3. This volume is the total volume for the embankment carried out on the right and left of the channel.

2. Stripping Work

37. This stripping or tree cutting and cutting work is intended to clean up the remaining topsoil where there is still a lot of organic soil: grass, topsoil, roots and non-organic material, namely the remains of buildings, foundations, etc. and remove them from the location. profession. This stripping work is carried out in units of area m2 and is carried out along the top soil surface to be given the embankment.

3. Road Works Inspection

38. An inspection road is a road that is built beside a channel along a channel that functions to inspect, maintain and operate the channel. Besides, this inspection road is also commonly used as a farm road. Channel conditions The road inspection works were carried out using a macadam road inspection planned along the channel. The total length of the planned new inspection road at UPTD Saddang Wajo is 21,345.27 m with the length of the inspection road on the Saddang Wajo exhaust channel of 5,858.07 m and 15,487.20 m for the length of the planned inspection road on the AK 1 exhaust channel.

4. Making Benchmark

39. There are three types of benchmark (BM) that are planned to be made, namely the Hectometer BM, the Kilometer BM and the Sempadan BM. The Hectometer BM is planned to be made every 100m, the Kilometer BM is planned to be made every 1 Km and for the border BM it is planned to be made every 200m.

40. The following is a table for calculating the volume of civil works for Drain at the UPTD Saddang Wajo for embankment works, stripping works and road inspection works.

<Table 4.5> BoQ of SP Padonge Drain

	Embankment			Stripping		Pavement			
Section	Dim (M2)	Length (M)	Vol (M3)	Width (M)	Vol (M3)	Dim	Width (M)	Length (M)	Vol (M2)
SPA 1	0.06	0	0	4.61	0	0.6	3	0.00	0
SPA 2	1.28	148.02	189.4656	7.97	1179.719	0.6	3	148.02	444.06
SPA 3	1.19	118.84	141.4196	3.86	458.7224	0.6	3	118.84	356.52
SPA 4	0.54	109.03	58.8762	4.44	484.0932	0.6	3	109.03	327.09

Section	Embankment			Stripping		Pavement			
	Dim (M2)	Length (M)	Vol (M3)	Width (M)	Vol (M3)	Dim	Width (M)	Length (M)	Vol (M2)
SPA 5	0.01	158.67	1.5867	3.65	579.1455	0.6	3	158.67	476.01
SPA 6	0.08	114.77	9.1816	3.9	447.603	0.6	3	114.77	344.31
SPA 7	0.38	90.06	34.2228	7.87	708.7722	0.6	3	90.06	270.18
SPA 8	1.23	97.40	119.802	8.29	807.446	0.6	3	97.40	292.2
SPA 9	0.02	124.35	2.487	4.21	523.5135	0.6	3	124.35	373.05
SPA 10	1.23	125.55	154.4265	8.41	1055.876	0.6	3	125.55	376.65
SPA 11	0.02	122.36	2.4472	4.07	498.0052	0.6	3	122.36	367.08
SPA 12	0.01	122.64	1.2264	3.79	464.8056	0.6	3	122.64	367.92
SPA 13	0.08	134.73	10.7784	3.99	537.5727	0.6	3	134.73	404.19
SPA 14	0.05	101.76	5.088	8.06	820.1856	0.6	3	101.76	305.28
SPA 15	0.09	92.03	8.2827	8.31	764.7693	0.6	3	92.03	276.09
SPA 16	0.24	141.12	33.8688	4.9	691.488	0.6	3	141.12	423.36
SPA 17	0.07	134.24	9.3968	4.13	554.4112	0.6	3	134.24	402.72
SPA 18	0.01	80.18	0.8018	4.25	340.765	0.6	3	80.18	240.54
SPA 19	0.02	165.62	3.3124	4.29	710.5098	0.6	3	165.62	496.86
SPA 20	0.71	122.57	87.0247	4.88	598.1416	0.6	3	122.57	367.71
SPA 21	1.24	100.89	125.1036	8.23	830.3247	0.6	3	100.89	302.67
SPA 22	1.03	140.72	144.9416	4.27	600.8744	0.6	3	140.72	422.16
SPA 23	0.9	81.01	72.909	4.04	327.2804	0.6	3	81.01	243.03
SPA 24	1.03	98.89	101.8567	5.16	510.2724	0.6	3	98.89	296.67
SPA 25	0.08	91.99	7.3592	4.44	408.4356	0.6	3	91.99	275.97
SPA 26	0.05	173.06	8.653	8.4	1453.704	0.6	3	173.06	519.18
SPA 27	0.09	84.18	7.5762	4.33	364.4994	0.6	3	84.18	252.54
SPA 28	0.36	57.06	20.5416	7.57	431.9442	0.6	3	57.06	171.18
SPA 29	0.99	128.36	127.0764	7.49	961.4164	0.6	3	128.36	385.08
SPA 30	0.04	108.49	4.3396	7.57	821.2693	0.6	3	108.49	325.47
SPA 31	1.27	142.32	180.7464	7.44	1058.861	0.6	3	142.32	426.96
SPA 32	1.21	165.07	199.7347	4.99	823.6993	0.6	3	165.07	495.21
SPA 33	1.24	175.82	218.0168	7.48	1315.134	0.6	3	175.82	527.46
SPA 34	0.26	160.25	41.665	4.67	748.3675	0.6	3	160.25	480.75
SPA 35	1.17	63.06	73.7802	8.19	516.4614	0.6	3	63.06	189.18
SPA 36	0.02	127.01	2.5402	7.76	985.5976	0.6	3	127.01	381.03
SPA 37	0.93	113.54	105.5922	7.66	869.7164	0.6	3	113.54	340.62
SPA 38	0.26	114.59	29.7934	5.3	607.327	0.6	3	114.59	343.77
SPA 39	0.04	105.35	4.214	8.08	851.228	0.6	3	105.35	316.05
SPA 40	0.12	144.71	17.3652	3.93	568.7103	0.6	3	144.71	434.13
SPA 41	1.5	120.19	180.285	7.42	891.8098	0.6	3	120.19	360.57
SPA 42	0.03	126.84	3.8052	4.76	603.7584	0.6	3	126.84	380.52
SPA 43	0.47	125.79	59.1213	4.61	579.8919	0.6	3	125.79	377.37
SPA 44	0.25	92.56	23.14	3.76	348.0256	0.6	3	92.56	277.68
SPA 45	0.08	109.35	8.748	9.31	1018.049	0.6	3	109.35	328.05
SPA 46	0.6	91.19	54.714	5.24	477.8356	0.6	3	91.19	273.57
SPA 47	0.48	99.01	47.5248	5.56	550.4956	0.6	3	99.01	297.03
SPA 48	0.15	138.60	20.79	8.53	1182.258	0.6	3	138.60	415.8
SPA 49	0.6	100.57	60.342	9.95	1000.672	0.6	3	100.57	301.71
SPA 50	1.41	154.39	217.6899	5.14	793.5646	0.6	3	154.39	463.17
SPA 51	0.06	143.16	8.5896	5.64	807.4224	0.6	3	143.16	429.48
SPA 52	1.85	98.75	182.6875	5.33	526.3375	0.6	3	98.75	296.25
SPA 53	1.33	135.30	179.949	8.65	1170.345	0.6	3	135.30	405.9
SPA 54	0.08	129.58	10.3664	9.18	1189.544	0.6	3	129.58	388.74
SPA 55	0.52	100.88	52.4576	8.57	864.5416	0.6	3	100.88	302.64
SPA 56	0.12	117.88	14.1456	9.4	1108.072	0.6	3	117.88	353.64
SPA 57	0.22	91.16	20.0552	3.79	345.4964	0.6	3	91.16	273.48
SPA 58	0.15	120.67	18.1005	4.08	492.3336	0.6	3	120.67	362.01
SPA 59	0.05	147.49	7.3745	9.47	1396.73	0.6	3	147.49	442.47
SPA 60	0.39	83.30	32.487	8.72	726.376	0.6	3	83.30	249.9
SPA 61	0.24	117.52	28.2048	4.54	533.5408	0.6	3	117.52	352.56
SPA 62	0.07	168.77	11.8139	3.84	648.0768	0.6	3	168.77	506.31
SPA 63	0.33	107.88	35.6004	4.38	472.5144	0.6	3	107.88	323.64
SPA 64	0.1	174.42	17.442	4.09	713.3778	0.6	3	174.42	523.26
SPA 65	0.16	93.82	15.0112	9.06	850.0092	0.6	3	93.82	281.46
SPA 66	1.65	102.38	168.927	3.17	324.5446	0.6	3	102.38	307.14
SPA 67	0.14	153.31	21.4634	5.39	826.3409	0.6	3	153.31	459.93

	Embankment			Stripping		Pavement			
Section	Dim (M2)	Length (M)	Vol (M3)	Width (M)	Vol (M3)	Dim	Width (M)	Length (M)	Vol (M2)
SPA 68	0.65	89.50	58.175	3.98	356.21	0.6	3	89.50	268.5
SPA 69	0.1	136.31	13.631	9.51	1296.308	0.6	3	136.31	408.93
SPA 70	0.52	91.04	47.3408	4.14	376.9056	0.6	3	91.04	273.12
SPA 71	0.12	111.39	13.3668	8.74	973.5486	0.6	3	111.39	334.17
SPA 72	0.22	92.06	20.2532	3.83	352.5898	0.6	3	92.06	276.18
SPA 73	0.16	154.86	24.7776	4.52	699.9672	0.6	3	154.86	464.58
TOTAL	34.45	8600.23	4045.88	441.18	51778.16	43.8	219	8600.23	25800.69

4.9 Engineering Estimates

41. Based on the previous Bills of Quantities calculation, the unit price unit analysis was carried out using AHSP data from Permen PU No.28 / PRT / M / 2016 and the Saddang unit price for the 2021 fiscal year with the aim to get the total price of each work. The following is a summary of the work carried out and the unit price of each work and the total costs that must be incurred.

<Table 4.6> Preparation Work Estimates

No.	Uraian Pekerjaan	Kode Analisa	Ukuran Satuan	Kuantitas	Harga Satuan (Rp)	Total Harga (Rp)
I	**PEKERJAAN PERSIAPAN**					
1.1	Pemagaran Daerah Kerja	LA.01.a	m'	240.00	439,401.78	105456427.9
1.2	Direksi Keet	LA.02	m²	80.00	3,496,527.50	279,722,200.40
1.3	Papan Nama Pekerjaan	LA.03.b	bh	1.00	551,025.38	551,025.38
1.4	Mobilisasi dan Demobilisasi					
	a. Investigasi Lapangan	LA.04.a	Ls	1.00	11,040,000.00	11,040,000.00
	b. Sewa Lahan	LA.04.b	Ls	1.00	23,000,000.00	23,000,000.00
1.5	Foto Dokumentasi	LA.05.b	Set	5.00	2,868,100.00	14,340,500.00
1.6	Test Bahan & Pengujian Kualitas Mutu Pekerjaan	LA.06	Ls	1.00	139,408,750.00	139,408,750.00
1.7	Uitzet Trase Saluran	T.02.a	m'	-	614,675.00	-
1.8	Pemasangan Bouwplank	T.02.b.2	m'	-	156,354.00	-
1.9	Penggambaran (MC.0 dan MC.100)					
	a. Penggambaran dengan CAD	LA.07.a	lbr	1,000.00	614,675.00	614,675,000.00
	b. Pencetakan gambar Layout, Tampak, Potongan dan Detail	LA.07.c	lbr	1,000.00	156,354.00	156,354,000.00
1.1	Copy atau Penggandaan Buku/Kontrak/Laporan (Foto Copy dan Jilid)	LA.08.a	Set	30.00	143,750.00	4,312,500.00
1.11	As Built Drawing (Reduce dan Copy Kertas Ukuran A3, A2, A1)	LA.08.b	Set	5.00	1,242,000.00	6,210,000.00
					TOTAL - I	**1,355,070,403.65**

<Table 4.7> Saddang Wajo Drainage Canal Engineering Estimates

II	**PEKERJAAN PADA SALURAN PEMBUANG PADONGE**					
2.1	**PEKERJAAN TANAH**					
2.1.1	Pembersihan dan Stripping / Kosrekan, dengan menggunakan peralatan alat berat Bulldozer atau sejenisnya	T.01.a.1	m²	51,778.16	11,771.36	609,499,201.51
2.1.2	Kupasan Tebas Tebang dari tanaman pohon	T.01.b	m²	100.00	12,159.42	1,215,942.15
2.1.3	1 m3 Galian Tanah, menggunakan Excavator Standard	TM.02.a.1	m³	-	31,806.11	-
2.1.6	Mengangkut Tanah dari Borrow Area, jarak angkut 10 km, dengan menggunakan Alat Berat Dump Truck	TM.02.b.3).1	m³	4,045.88	344,516.16	1,393,871,184.48
2.1.7	Pemadatan Tanah (dengan baby roller)	T.14.b.1	m³	4,045.88	76,446.25	309,292,384.53
2.1.8	Perkerasan Jalan Type-B2	T.14.d.3	m²	25,800.69	128,971.81	3,327,561,592.63
					Sub Total 2.1	5,641,440,305.30
2.2	**PEKERJAAN PASANGAN BATU DAN BETON**					
2.2.1	Pembuatan dan Pemasangan Patok Hektometer	T.03.b	bh	86.00	252,364.49	21,703,926.44
2.2.2	Pembuatan dan Pemasangan Patok Kilometer	T.03.b	bh	8.00	252,365.49	2,018,923.91
2.2.3	Pembuatan dan Pemasangan Patok Sempadan	T.03.b	bh	43.00	252,366.49	10,852,049.22
					Sub Total 2.2	34,574,899.57
					TOTAL - II	**5,676,015,204.86**
					JUMLAH (I+II)	**7,031,085,608.51**

ATTACHMENT 1

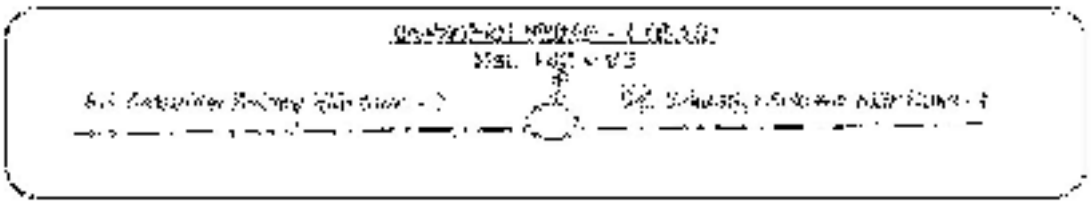
[illegible]

Name Of Canals	Area	Design Discharge (Q)	Hydraulic gradient	Rough coeff.	Side slope	Bed width	Depth	Free board	Canal high	Tractive force	Velocity
			I	k	m	b	h	w	H=h+w	τ=γRI	V=Q/A
Unit	Ha	m³/s				m	m	m	m		m/s
BELANA HILIR SG											
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

DED PRESENTATION TOPICS

SALURAN PENGUNCIR DPL/MA HULU

1. Konfigurasi Saluran (S.D.18)



PERHITUNGAN HIDROLIS [illegible]

[illegible]	:	[illegible]
[illegible]	:	[illegible]
[illegible]	:	[illegible]

I. DATA DIMENSI SALURAN

1. [illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

2. [illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

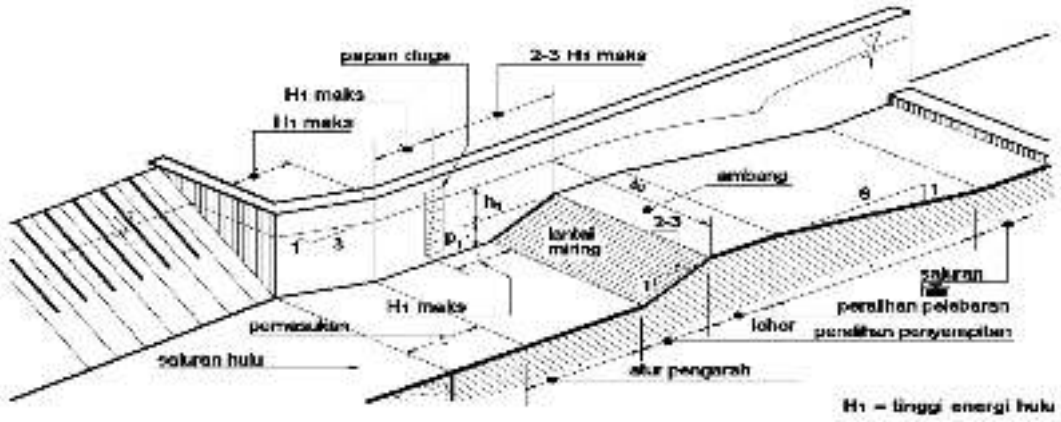
3. [illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

[illegible]

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

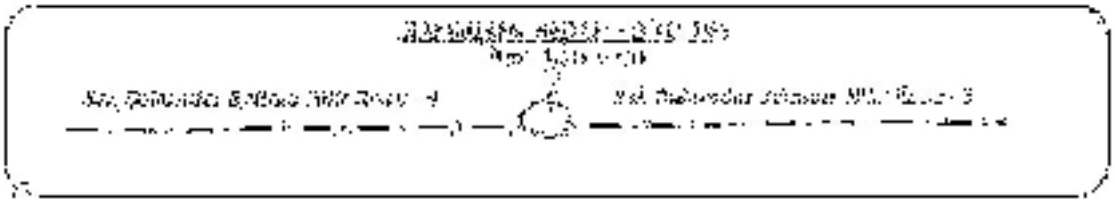
[illegible]

[illegible]

[illegible]

[illegible]

2. [illegible]



[illegible]

[illegible]	:	[illegible]
[illegible]	:	[illegible]
[illegible]	:	[illegible]

I. [illegible]

1. [illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

2. [illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

3. [illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

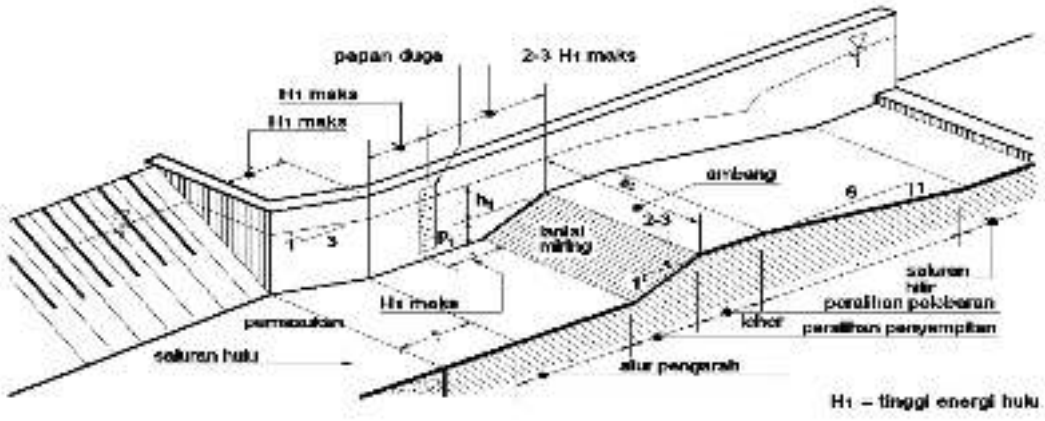
[illegible]

1. [illegible]

2. [illegible]

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. Menentukan tinggi muka air di atas ambang lebar (h)

⇨ Data :

$Q_{tersier}$ = 0.068 m^3/dt

b_{ambang} = 0.30 m

⇨ Perhitungan :

Rumus :

$Q = 1{,}71 \times b \times h^{3/2}$

Penyelesaian :

$$h = \left[\frac{Q}{1{,}71 \times b}\right]^{2/3}$$

$$= \left[\frac{0.068}{1.71 \times 0.30}\right]^{2/3}$$

$$= 0.26 \text{ m}$$

3. Menentukan kehilangan energi di bangunan ukur ambang lebar (z)

z = 1/2 h (min 0,05 m)

= 0.50 x 0.26

= 0.13 m

4. Menentukan Elevasi muka air tuntutan di saluran sekunder

- Elevasi sawah tertinggi	=	14.67
- Genangan air di sawah	=	0.10
- Kehilangan energi dari saluran tersier ke petak sawah	=	[illegible]
- Kehilangan energi di saluran sekunder	=	0.0006
- Kehilangan energi di bangunan ukur	=	[illegible]
- Kehilangan energi di [illegible]	=	[illegible]
- Kehilangan energi [illegible] pemberian (0.10 x [illegible])	=	0.01
- Jadi Elevasi muka air [illegible] di saluran sekunder (Pintu ukur -4	=	[illegible]

Dari perhitungan elevasi muka air di bangunan Ukur Saddang Pintu -4 diperoleh elevasi muka air pada level 100% = 15.62

Elev. 100% = Elev. muka air OK

5. Menetukan bukaan pintu sorong (a)

- Ukuran Pintu :
  - Lebar pintu sorong (B) = 0.50 m
  - Tinggi daun pintu sorong (h) = 0.50 m
  - Elevasi dasar pintu = + 15.02 m

- Menentukan bukaan pintu (a)

  Perhitungan pada kondisi debit 100% ($Q_{100\%}$)

Debit di saluran tersier (Q)	=	0.068	m^3/dt
Tinggi air di hulu pintu di atas ambang pintu (h1)	=	0.60	m
Tinggi air di saluran tersier di hilir pintu (h2)	=	0.35	m
Bukaan pintu (a)	=	0.07	m

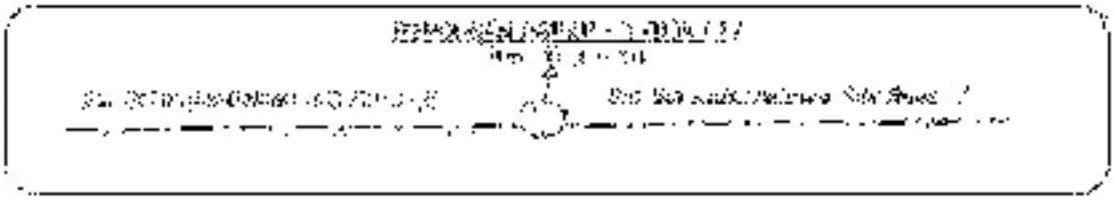
- Check hitungan :

[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]	:	[illegible]
[illegible]	:	[illegible]
[illegible]	:	[illegible]

1. [illegible]

1. [illegible]

A	=	[illegible]
Q	=	[illegible]
v	=	0.56 m/dt
b	=	2.80 m
h	=	1.35 m
i	=	0.00011
m	=	1.00
k	=	60
w	=	0.60 m

2. **Dimensi SaluranTersier B B.17 Ka 1 Ruas 1**

A	=	30.00 ha
Q	=	0.031 m^3/dt
v	=	0.25 m/dt
b	=	0.65 m
h	=	0.19 m
i	=	0.0003
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

3. [illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

2. [illegible]

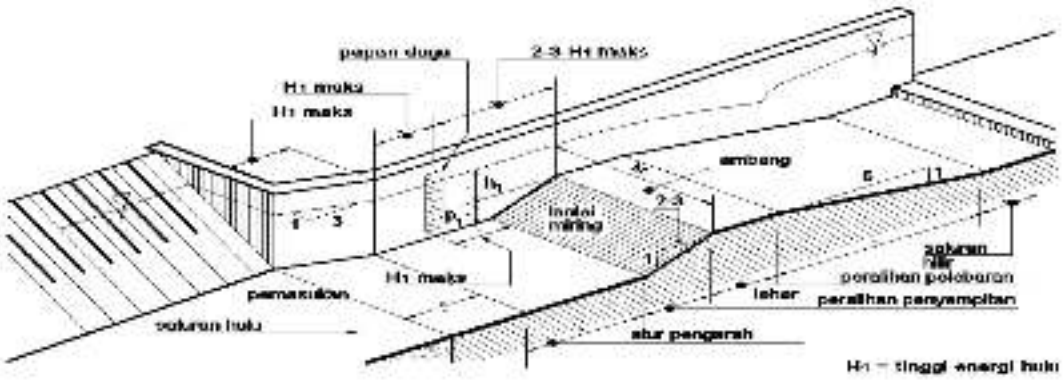
➪ Elevasi dasar pintu sadap tersier	=	+ 13.84 m
➪ Elev. dasar Saluran tersier di hilir pintu sadap	=	+ 13.51
➪ Elevasi Muka Air di hilir pintu sadap	=	+ 13.84 m
➪ Lebar pintu sadap tersier (B)	=	0.50 m
➪ elevasi dasar saluran di hilir bangunan ukur	=	+ 13.51
➪ elevasi muka air di hilir bangunan ukur	=	+ 13.70

3. **Data teknis saluran dan bangunan saluran tersier arah kanan (B.17 Ka 2)**

➪ Elevasi dasar pintu sadap tersier	=	+ 13.88 m
➪ Elev. dasar Saluran tersier di hilir pintu sadap	=	+ 13.51
➪ Elevasi Muka Air di hilir pintu sadap	=	+ 13.85 m
➪ Lebar pintu sadap tersier (B)	=	0.70 m
➪ elevasi dasar saluran di hilir bangunan ukur	=	+ 13.51
➪ elevasi muka air di hilir bangunan ukur	=	+ 13.75

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.17 Ka 1

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



[illegible]

[illegible]

[illegible]

[illegible]

$$= \left[\frac{0.031}{1.71 \times 0.30}\right]^{2/3}$$

$$= 0.15 \text{ m} \qquad 0.13$$

3. Menentukan kehilangan energi di bangunan ukur ambang lebar (z)

$$z = 1/2\,h \text{ (min. 0,05 m)}$$

$$= 0.50 \times 0.15$$

$$= 0.08 \text{ m}$$

4. Menentukan Elevasi muka air tuntutan di saluran sekunder

- Elevasi sawah tertinggi	=	12.45
- Genangan air di sawah	=	0.10
- [illegible]	=	[illegible]
- Kehilangan energi di [illegible]	=	[illegible]
Kehilangan energi di bangunan ukur		[illegible]
- Kehilangan energi di [illegible]	-	[illegible]
- Kehilangan energi di [illegible]	-	[illegible]
Jadi elevasi muka air tertinggi di [illegible]	-	[illegible]

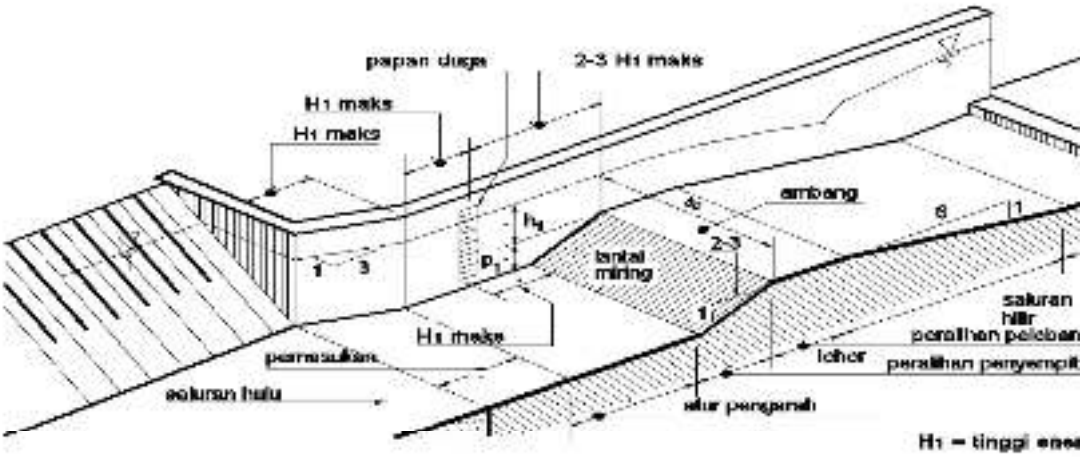
Dari perhitungan elevasi muka air [illegible] Dalam [illegible]

[illegible] kondisi [illegible] → 14.55

[illegible] OK

IV. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.17 Ka 2

1. **Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap**



2. **Menentukan tinggi muka air di atas ambang lebar (h)**

➪ Data :

$Q_{tersier}$ = 0.023 m^3/dt

b_{ambang} = 0.30 m

➪ Perhitungan :

Rumus :

$$Q = 1.71 \times b \times h^{3/2}$$

Penyelesaian :

$$h = \left[\frac{Q}{1,71 \times b}\right]^{2/3}$$

$$= \left[\frac{0.023}{1.71 \times 0.30}\right]^{2/3}$$

$$= 0.13 \text{ m}$$

3. **Menentukan kehilangan energi di bangunan ukur ambang lebar (z)**

z = 1/2 h (min. 0,05 m)

= 0.50 x 0.13

= 0.06 m

4. Menentukan Elevasi muka air tuntutan di saluran sekunder

- Elevasi sawah tertinggi	=	13.46
- Genangan air di sawah	=	0.10
- Kehilangan energi dari saluran tersier ke sawah	=	0.05
- Kehilangan energi di sepanjang saluran tersier	=	0.0003
- Kehilangan energi di bangunan ukur	=	0.06
- Kehilangan energi di pintu sadap	=	0.10
- Kehilangan energi di saluran pembawa (0.10 x 100%)	=	0.00
- Jadi elevasi muka air tuntutan di saluran sek. Belawa ruas - 8	=	+ 13.78

Dari perhitungan elevasi muka air di saluran sek. Belawa Ruas - 8

didapat elevasi muka air pada kondisi 100% = 14.86

EMA 100% > EMA tuntutan **OK**

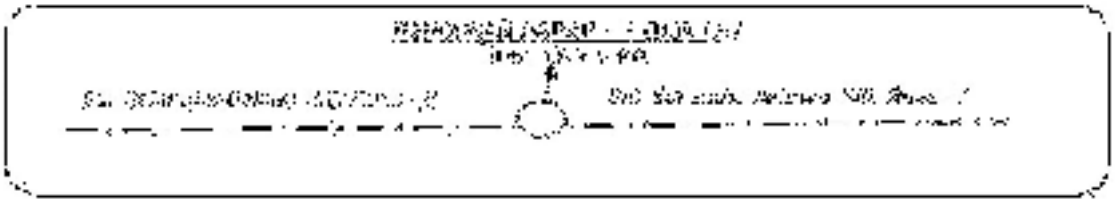
5. Menetukan bukaan pintu sorong (a)

[illegible]

[illegible]

[illegible]

[illegible] Saluran A [illegible]



[illegible]

[illegible]	:	[illegible]
[illegible]	:	[illegible]
[illegible]		[illegible]

I. DATA DIMENSI SALURAN

1. Dimensi Saluran [illegible]

A	=	[illegible]
Q	=	[illegible]
v	=	0.56 m/dt
b	=	2.60 m
h	=	1.35 m
i	=	0.00011
m	=	1.00
k	=	60
w	=	0.60 m

2. Dimensi SaluranTersier B B.18 Ruas 1

A	=	53.00 ha
Q	=	0.080 m^3/dt
v	=	0.31 m/dt
b	=	1.20 m
h	=	0.22 m
i	=	0.0003
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

3. Dimensi Saluran [illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

II. DATA TEKNIS SALURAN DAN BANGUNAN

1. Data teknis saluran dan bangunan di saluran Sekender Belawa Hilir Ruas -6

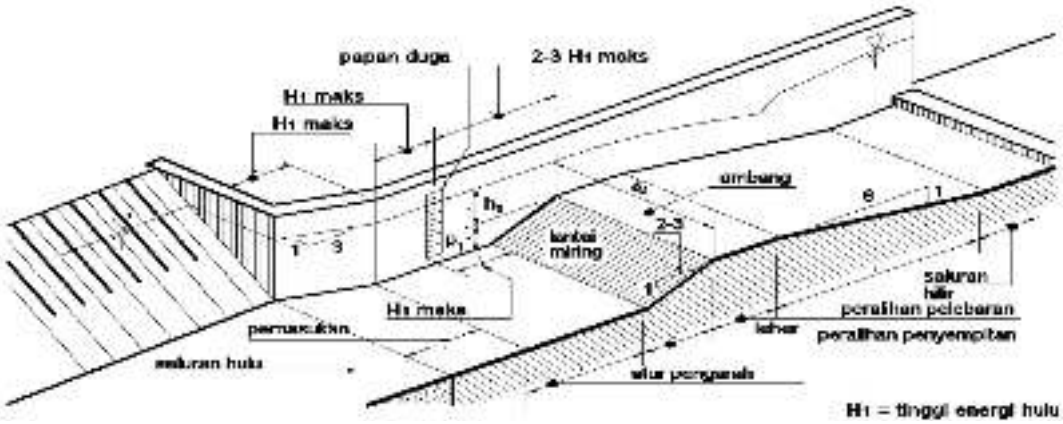
- Elev. dasar Sal. Sek. Belawa Hilir Ruas - 6 (di bangunan sadap) = + 13.44 m
- Elevasi Muka Air 100% di sal. Sek. Belawa Hilir Ruas - 6 = + 14.79 m

2. Data teknis saluran dan bangunan saluran tersier arah kanan (B.18)

- Elevasi dasar pintu sadap tersier = + 13.94 m
- Elev. dasar Saluran tersier di hilir pintu sadap = + 13.64
- Elevasi Muka Air di hilir pintu sadap = + 13.98 m
- Lebar pintu sadap tersier (B) = 0.50 m
- elevasi dasar saluran di hilir bangunan ukur = + 13.64
- elevasi muka air di hilir bangunan ukur = + 13.98

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.18

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



[illegible]

[illegible]

[illegible]

[illegible]

$$= \left[\frac{0.080}{1.71 \times 0.50} \right]^{2/3}$$

$$= 0.21 \text{ m}$$

3. Menentukan kehilangan energi di bangunan ukur ambang lebar (z)

$$z = 1/2\,h \text{ (min. 0,05 m)}$$

$$= 0.50 \times 0.21$$

$$= 0.10 \text{ m}$$

4. Menentukan Elevasi muka air tuntutan di saluran sekunder

Elevasi sawah tertinggi	=	13.59
Genangan air di sawah	=	0.10
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

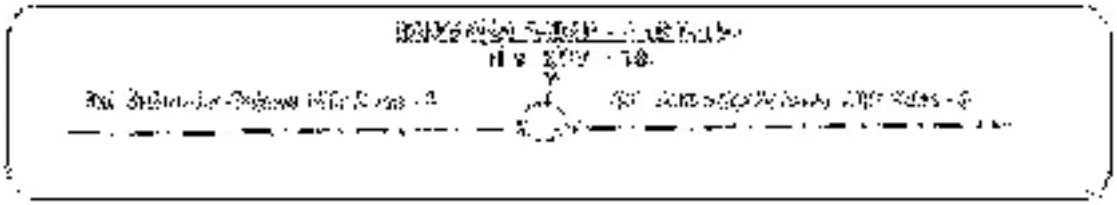
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]	:	[illegible]
[illegible]	:	[illegible]
[illegible]	:	[illegible]

1 DATA DIMENSI SALURAN

[illegible]

x	=	[illegible]
Q	=	2.910 m³/dt
v	=	0.54 m/dt
b	=	2.80 m
h	=	1.31 m
i	=	0.00011
m	=	1.00
k	=	60
w	=	0.60 m

2. Dimensi SaluranTersier B B.19 Ruas 1

A	=	90.72 ha
Q	=	0.102 m³/dt
v	=	0.24 m/dt
b	=	0.60 m
h	=	0.43 m
i	=	[illegible]
m	=	[illegible]
k	=	[illegible]
w	=	[illegible]

[illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
i	=	[illegible]
[illegible]	=	[illegible]
k	=	[illegible]
[illegible]	=	[illegible]

II. DATA TEKNIS SALURAN DAN BANGUNAN

1. Data teknis saluran dan bangunan di saluran Sekender Belawa Hilir Ruas -8

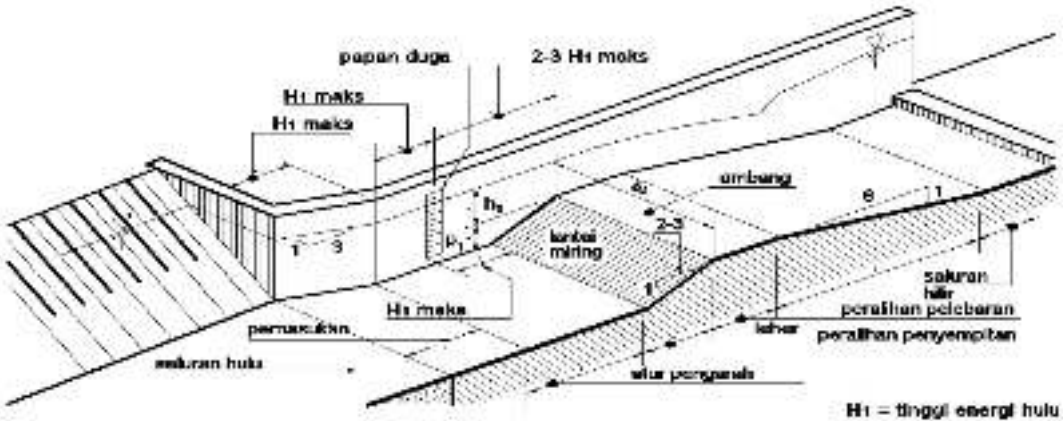
- Elev. dasar Sal. Sek. Belawa Hilir Ruas - 8 (di bangunan sadap) = + 13.96 m
- Elevasi Muka Air 100% di sal. Sek. Belawa Hilir Ruas - 8 = + 14.98 m

2. Data teknis saluran dan bangunan saluran tersier arah kanan (B.19)

- Elevasi dasar pintu sadap tersier = + 14.06 m
- Elev. dasar Saluran tersier di hilir pintu sadap = + 13.91
- Elevasi Muka Air di hilir pintu sadap = + 14.15 m
- Lebar pintu sadap tersier (B) = 0.60 m
- elevasi dasar saluran di hilir bangunan ukur = + 13.81
- elevasi muka air di hilir bangunan ukur = + 13.98

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.20

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



[illegible]

$$z = \left[\frac{Q}{1.71 \times b}\right]^{2/3}$$

$$= \left[\frac{0.102}{1.71 \times 0.40}\right]^{2/3}$$

$$= 0.28 \text{ m}$$

3. **Menentukan kehilangan energi di bangunan ukur ambang lebar (z)**

z = 1/2 h (min. 0,05 m)

= 0.50 x 0.28

= 0.14 m

4. **Menentukan Elevasi muka air tuntutan di saluran sekunder**

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

5. [illegible]

[illegible]

[illegible]

[illegible]	:	[illegible]
[illegible]	:	[illegible]
[illegible]	:	[illegible]

I. [illegible]

1. Dimensi Saluran Sekunder [illegible]

A	=	1871.47 ha
Q	=	[illegible]
v	=	0.54 m/dt
b	=	2.80 m
h	=	1.27 m
i	=	0.00011
m	=	1.00
k	=	60
w	=	0.60 m

2. **Dimensi Saluran Sekunder Wattang B B.20 Ruas 1**

A	=	345.00 ha
Q	=	0.520 m^3/dt
v	=	0.53 m/dt
b	=	0.60 m
h	=	0.73 m
i	=	0.0003
m	=	[illegible]
k	=	[illegible]
w	=	[illegible]

3. Dimensi Saluran [illegible]

A	=	[illegible]
Q	=	[illegible]
v	=	[illegible]
h	=	[illegible]
b	=	[illegible]
i	=	[illegible]
m	=	[illegible]
k	=	[illegible]
w	=	[illegible]

II. DATA TEKNIS SALURAN DAN BANGUNAN

1. Data teknis saluran dan bangunan di saluran Sekender Belawa Hilir Ruas -9

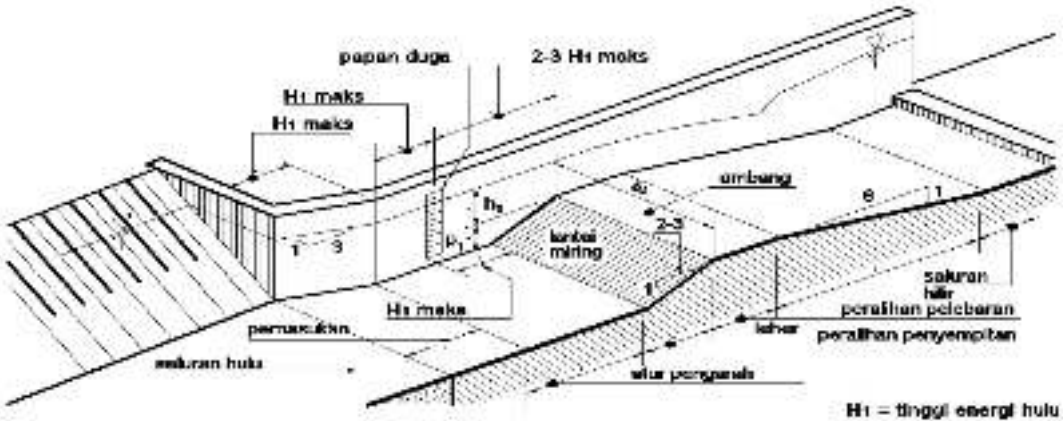
- Elev. dasar Sal. Sek. Belawa Hilir Ruas - 9 (di bangunan sadap) = + 13.10 m
- Elevasi Muka Air 100% di sal. Sek. Belawa Hilir Ruas - 9 = + 14.37 m

2. Data teknis saluran dan bangunan saluran tersier arah kanan (B.20)

- Elevasi dasar pintu sadap tersier = + 13.60 m
- Elev. dasar Saluran tersier di hilir pintu sadap = + 13.25
- Elevasi Muka Air di hilir pintu sadap = + 13.99 m
- Lebar pintu sadap tersier (B) = 0.60 m
- elevasi dasar saluran di hilir bangunan ukur = + 13.25
- elevasi muka air di hilir bangunan ukur = + 13.98

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.20

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



[illegible]

$$= \left[\frac{0.520}{1.71 \times 0.60} \right]^{2/3}$$

$$= 0.64 \text{ m}$$

3. **Menentukan kehilangan energi di bangunan ukur ambang lebar (z)**

z = 1/2 h (min. 0,05 m)

= 0.50 x 0.64

= 0.32 m

4. **Menentukan Elevasi muka air tuntutan di saluran sekunder**

- Elevasi sawah tertinggi	=	13.2
- Genangan air di sawah	=	0.1
- Kehilangan energi di saluran tersier ke sawah	=	[illegible]
- Kehilangan energi di bangunan [illegible]	=	[illegible]
- Kehilangan energi di bangunan ukur	=	0.2
- Kehilangan energi di [illegible]	=	[illegible]
- Kehilangan energi di saluran primer ke [illegible]	=	[illegible]
Jadi elevasi muka air tuntutan di saluran sek. [illegible]	=	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

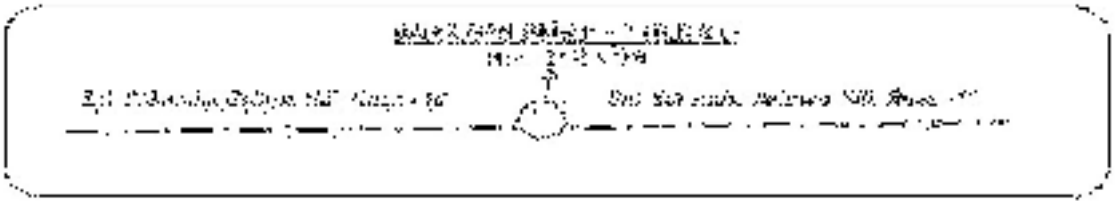
[illegible]

[illegible]

[illegible]

[illegible]

7. Bangunan Sadap 7 (B.B.21)



PERHITUNGAN HIDROLIS BANGUNAN SADAP

[illegible]	:	Sadap (B.B.21)
[illegible]	:	[illegible]
[illegible]	:	[illegible] - 10

1. DATA DIMENSI SALURAN

1. Dimensi Saluran Sekunder Sebelum Dipecah Ruas [illegible]

A	=	[illegible] ha
Q	=	[illegible] m³/dt
v	=	0.75 m/dt
b	=	2.00 m
h	=	1.00 m
i	=	0.0003
m	=	1.00
k	=	60
w	=	0.60 m

2. Dimensi SaluranTersier B B.21 Ka 1 Ruas 1

A	=	40.00 ha
Q	=	0.056 m³/dt
v	=	0.28 m/dt
b	=	1.00 m
h	=	0.20 m
i	=	0.0003
m	=	[illegible]
k	=	[illegible]
w	=	[illegible] m

3. Dimensi SaluranTersier (B.B.21) Ka 1 Ruas 1

A	=	[illegible] ha
Q	=	[illegible] m³/dt
v	=	[illegible]
b	=	[illegible]
h	=	[illegible]
i	=	[illegible]
m	=	[illegible]
k	=	[illegible]
w	=	[illegible] m

[illegible]

[illegible]

[illegible]

- Elevasi Muka Air 100% di sal. Sek. Belawa Hilir Ruas - 10 = + 14.08 m

2. **Data teknis saluran dan bangunan saluran tersier arah kanan (B.21 Ka 1)**

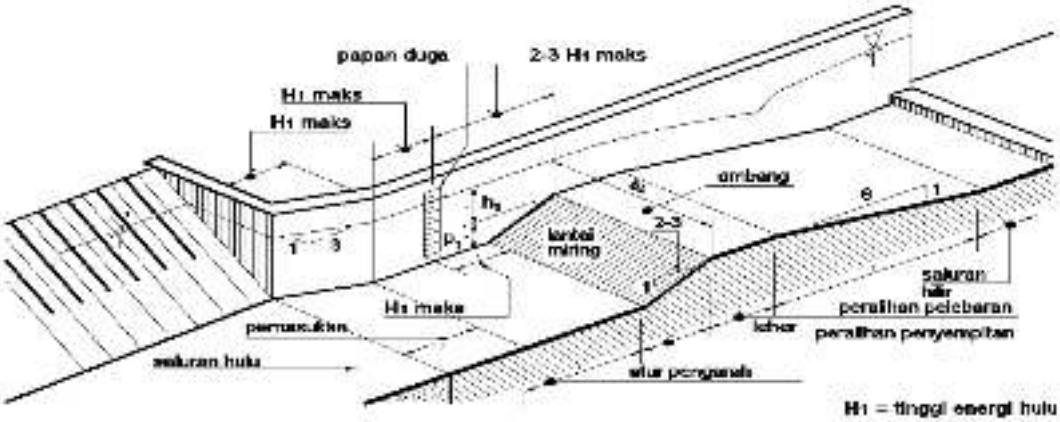
- Elevasi dasar pintu sadap tersier = + 13.37 m
- Elev. dasar Saluran tersier di hilir pintu sadap = + 12.73
- Elevasi Muka Air di hilir pintu sadap = + 13.09 m
- Lebar pintu sadap tersier (B) = 0.50 m
- elevasi dasar saluran di hilir bangunan ukur = + 12.84
- elevasi muka air di hilir bangunan ukur = + 13.03

3. **Data teknis saluran dan bangunan saluran tersier arah kanan (B.21 Ka 2)**

- Elevasi dasar pintu sadap tersier = + 13.24 m
- Elev. dasar Saluran tersier di hilir pintu sadap = + 13.03
- Elevasi Muka Air di hilir pintu sadap = + 13.38 m
- Lebar pintu sadap tersier (B) = 0.50 m
- elevasi dasar saluran di hilir bangunan ukur = + 13.14
- elevasi muka air di hilir bangunan ukur = + 13.33

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.21 Ka 1

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. Menentukan tinggi muka air di atas ambang lebar (h)

⇨ Data :

$Q_{tersier}$ = 0.056 m^3/dt

b_{ambang} = 0.35 m

⇨ Perhitungan :

Rumus :

$Q = 1{,}71 \times b \times h^{3/2}$

Penyelesaian :

$$h = \left[\frac{Q}{1{,}71 \times b}\right]^{2/3}$$

$$= \left[\frac{0.056}{1.71 \times 0.35}\right]^{2/3}$$

$$= 0.21 \text{ m}$$

3. Menentukan kehilangan energi di bangunan ukur ambang lebar (z)

z = 1/2 h (min 0,05 m)

= 0.50 x 0.21

= 0.10 m

[illegible]

[illegible]

[illegible]

2. [illegible]

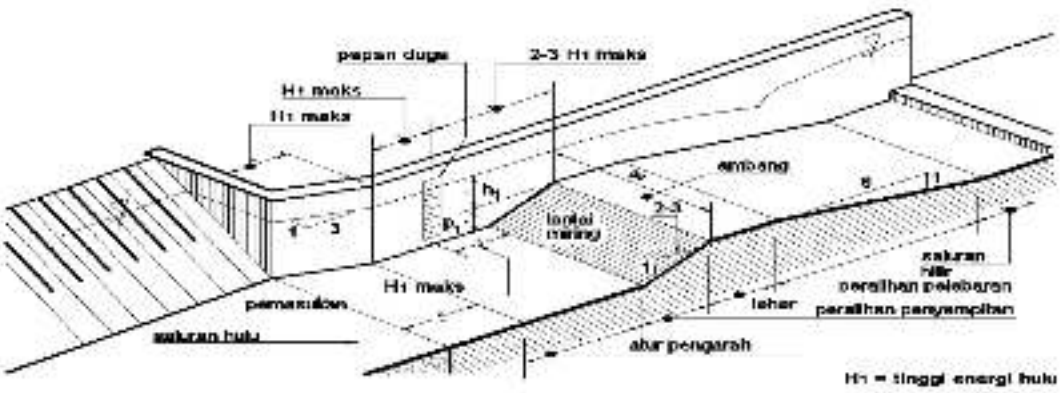
- Elevasi dasar pintu sadap tersier = + 13.37 m
- Elev. dasar Saluran tersier di hilir pintu sadap = + 12.73
- Elevasi Muka Air di hilir pintu sadap = + 13.05 m
- Lebar pintu sadap tersier (B) = 0.50 m
- elevasi dasar saluran di hilir bangunan ukur = + 12.84
- elevasi muka air di hilir bangunan ukur = + 13.03

3. Data teknis saluran dan bangunan saluran tersier arah kanan (B.21 Ka 2)

- Elevasi dasar pintu sadap tersier = + 13.24 m
- Elev. dasar Saluran tersier di hilir pintu sadap = + 13.03
- Elevasi Muka Air di hilir pintu sadap = + 13.39 m
- Lebar pintu sadap tersier (B) = 0.50 m
- elevasi dasar saluran di hilir bangunan ukur = + 13.14
- elevasi muka air di hilir bangunan ukur = + 13.32

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.21 Ka 1

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

$$z = \left[\frac{Q}{1.71 \times b}\right]^{2/3}$$

$$= \left[\frac{0.056}{1.71 \times 0.35}\right]^{2/3}$$

$$= 0.21 \text{ m}$$

3. **Menentukan kehilangan energi di bangunan ukur ambang lebar (z)**

$$z = 1/2\,h \text{ (min. 0,05 m)}$$

$$= 0.50 \times 0.21$$

$$= 0.10 \text{ m}$$

4. **Menentukan Elevasi muka air tuntutan di saluran sekunder**

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]		[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

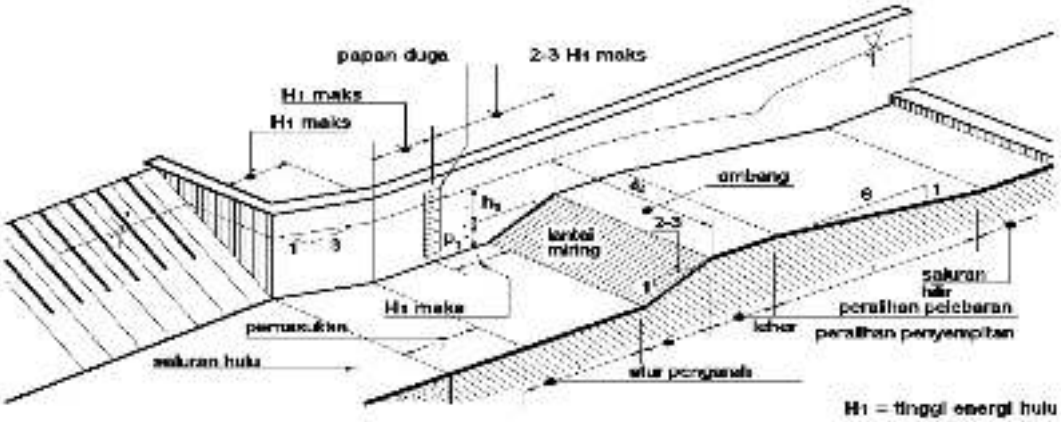
[illegible]

[illegible]

[illegible]

IV. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.21 Ka 2

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. Menentukan tinggi muka air di atas ambang lebar (h)

➪ Data :

$Q_{tersier}$ = 0.049 m^3/dt

b_{ambang} = 0.50 m

➪ Perhitungan :

Rumus :

$Q = 1{,}71 \times b \times h^{3/2}$

Penyelesaian :

$$h = \left[\frac{Q}{1{,}71 \times b}\right]^{2/3}$$

$$= \left[\frac{0.049}{1.71 \times 0.50}\right]^{2/3}$$

$$= 0.15 \text{ m}$$

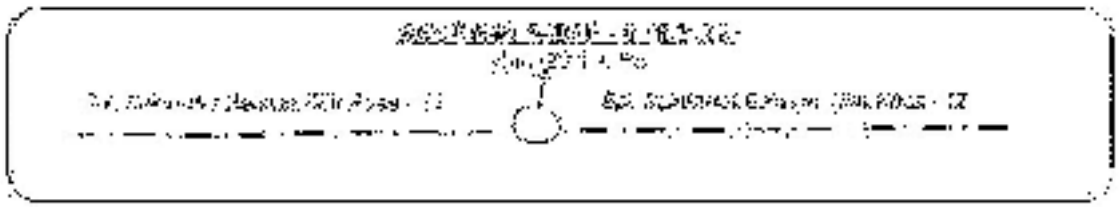
3. Menentukan kehilangan energi di bangunan ukur ambang lebar (z)

z = 1/2 h (min 0,05 m)

= 0.50 x 0.15

= 0.07 m

[illegible]



[illegible]

[illegible]	:	[illegible]
[illegible]	:	[illegible]
[illegible]	:	[illegible]

I. [illegible]

1. Dimensi Saluran [illegible] Ruas 1

A	=	[illegible] ha
Q	=	2.070 m^3/dt
v	=	0.70 m/dt
b	=	2.00 m
h	=	0.99 m
i	=	0.00026
m	=	1.00
k	=	60
w	=	0.60 m

2. Dimensi SaluranTersier B B.22 Ki 1 Ruas 1

A	=	20.00 ha
Q	=	0.028 m^3/dt
v	=	0.17 m/dt
b	=	0.50 m
h	=	0.23 m
i	=	[illegible]
m	=	[illegible]
k	=	[illegible]
w	=	[illegible] m

3. [illegible]

A	=	[illegible] ha
Q	=	[illegible] m^3/dt
v	=	[illegible] m/dt
b	=	[illegible] m
h	=	[illegible] m
i	=	[illegible]
m	=	[illegible]
k	=	[illegible]
w	=	[illegible] m

[illegible]

[illegible]

[illegible]

2. **Data teknis saluran dan bangunan saluran tersier arah kanan (B.22 Ki 1)**

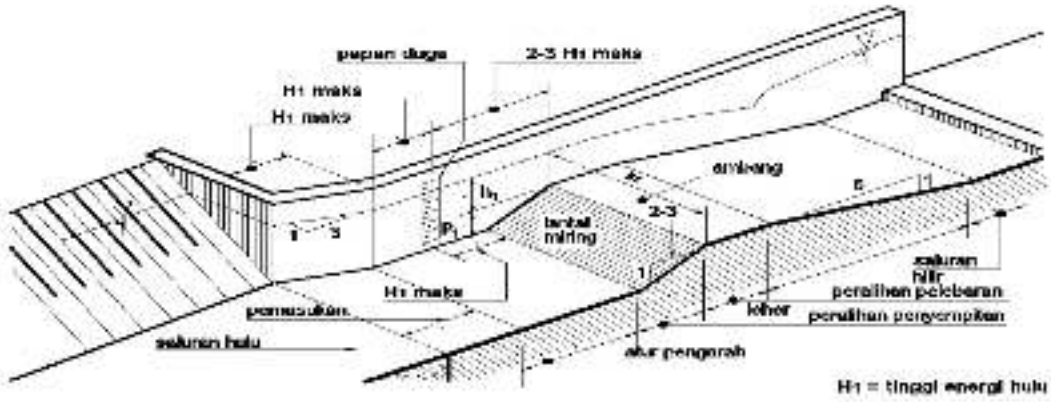
➪ Elevasi dasar pintu sadap tersier	=	+	13.03 m
➪ Elev. dasar Saluran tersier di hilir pintu sadap	=	+	12.76
➪ Elevasi Muka Air di hilir pintu sadap	=	+	13.11 m
➪ Lebar pintu sadap tersier (B)	=		1.25 m
➪ elevasi dasar saluran di hilir bangunan ukur	=	+	12.93
➪ elevasi muka air di hilir bangunan ukur	=	+	13.06

3. **Data teknis saluran dan bangunan saluran tersier arah kanan (B.22 Ki 2)**

➪ Elevasi dasar pintu sadap tersier	=	+	13.58 m
➪ Elev. dasar Saluran tersier di hilir pintu sadap	=	+	13.51
➪ Elevasi Muka Air di hilir pintu sadap	=	+	13.85 m
➪ Lebar pintu sadap tersier (B)	=		0.50 m
➪ elevasi dasar saluran di hilir bangunan ukur	=	+	13.58
➪ elevasi muka air di hilir bangunan ukur	=	+	13.80

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.22 Ki 1

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. Menentukan tinggi muka air di atas ambang lebar (h)

⇨ Data :

$Q_{tersier}$ = 0.028 m^3/dt

b_{ambang} = 0.30 m

⇨ Perhitungan :

Rumus :

$$Q = 1{,}71 \times b \times h^{3/2}$$

Penyelesaian :

$$h = \left[\frac{Q}{1{,}71 \times b}\right]^{2/3}$$

$$= \left[\frac{0.028}{1.71 \times 0.30}\right]^{2/3}$$

$$= 0.14 \text{ m}$$

3. Menentukan kehilangan energi di bangunan ukur ambang lebar (z)

z = 1/2 h (min. 0,05 m)

= 0.50 x 0.14

= 0.07 m

4. Menentukan Elevasi muka air tuntutan di saluran sekunder

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

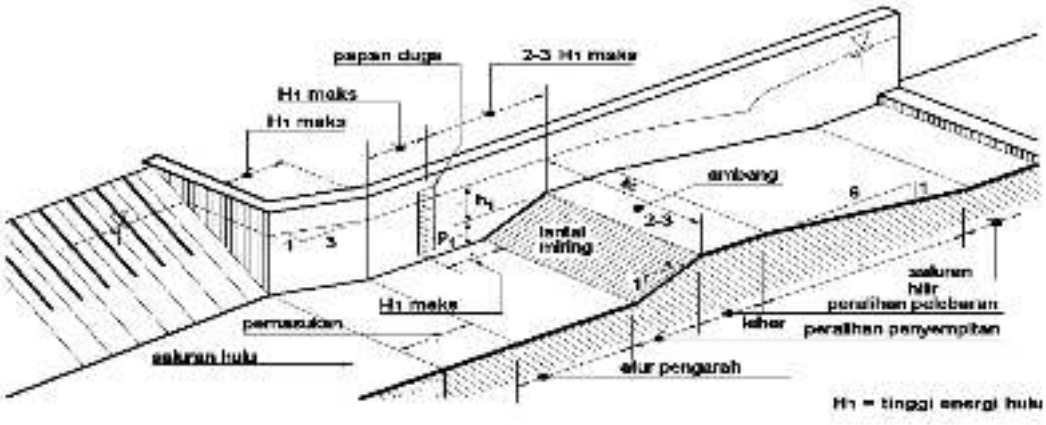
[illegible]

[illegible]

[illegible]

IV. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.22 KI 2

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. Menentukan tinggi muka air di atas ambang lebar (h)

[illegible]

[illegible]

[illegible]

[illegible]

$$h = \left[\frac{Q}{1.71 \times 0.30} \right]^{2/3}$$

$$= \left[\frac{0.127}{1.71 \times 0.30} \right]^{2/3}$$

$$= 0.14 \text{ m}$$

3. Menentukan kehilangan energi di bangunan ukur ambang lebar (z)

z = 1/2 h (min. 0.05 m)

= 0.50 x 0.14

= 0.07 m

4. **Menentukan Elevasi muka air tuntutan di saluran sekunder**

- Elevasi sawah tertinggi	=	13.53
- Genangan air di sawah	=	0.10
- Kehilangan energi dari saluran tersier ke sawah	=	0.05
- Kehilangan energi di sepanjang saluran tersier	=	0.0003
- Kehilangan energi di bangunan ukur	=	0.07
- Kehilangan energi di pintu sadap	=	0.10
- Kehilangan energi di saluran pembawa (0.10 $_{\text{Intake}}$)	=	0.01
- Jadi elevasi muka air tuntutan di saluran sek. Belawa ruas - 11	=	+ 13.86

Dari perhitungan elevasi muka air di saluran sek. Belawa Ruas -11

didapat elevasi muka air pada kondisi 100% + 13.67

FMA 100% > FMA tuntutan **NOT OK**

5. [illegible]

[illegible]

[illegible]

- [illegible]

  [illegible] = [illegible] / [illegible]

  = [illegible] m

  [illegible]

  [illegible] = [illegible]

  [illegible] = [illegible] / [illegible]

  = [illegible] m

  [illegible]

  [illegible] = [illegible]

  [illegible]

  [illegible] = [illegible] [illegible]

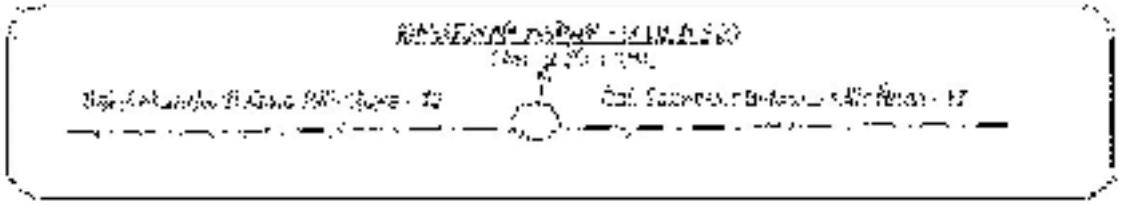
  [illegible] = [illegible] [illegible] [illegible] [illegible] [illegible]

  [illegible] = [illegible] m

- [illegible]

  Pada [illegible] = [illegible]

b. Bangunan Sadap 9 (B.23 Ki)



[illegible]

[illegible]	:	[illegible]
[illegible]	:	[illegible]
[illegible]	:	[illegible]

I. [illegible]

1. Dimensi Saluran [illegible] Bendung [illegible]

A	=	[illegible] ha
Q	=	[illegible] m^3/dt
v	=	0.71 m/dt
b	=	2.00 m
h	=	0.97 m
i	=	0.00027
m	=	1.00
k	=	60
w	=	0.60 m

2. **Dimensi SaluranTersier B B.23 Ki Ruas 1**

A	=	63.00 ha
Q	=	0.088 m^3/dt
v	=	0.23 m/dt
b	=	0.50 m
h	=	0.42 m
i	=	0.0003
m	=	1.0
k	=	35
w	=	0.20 m

3. Dimensi Saluran Sekunder [illegible] Ruas 1-2

A	=	[illegible] ha
Q	=	[illegible] m^3/dt
v	=	[illegible] m/dt
b	=	2.00 m
h	=	[illegible] m
i	=	[illegible]
m	=	1.00
k	=	50
w	=	0.80 m

II. DATA TEKNIS SALURAN DAN BANGUNAN

1. Data teknis saluran dan bangunan di saluran Sekender Belawa Hilir Ruas -13

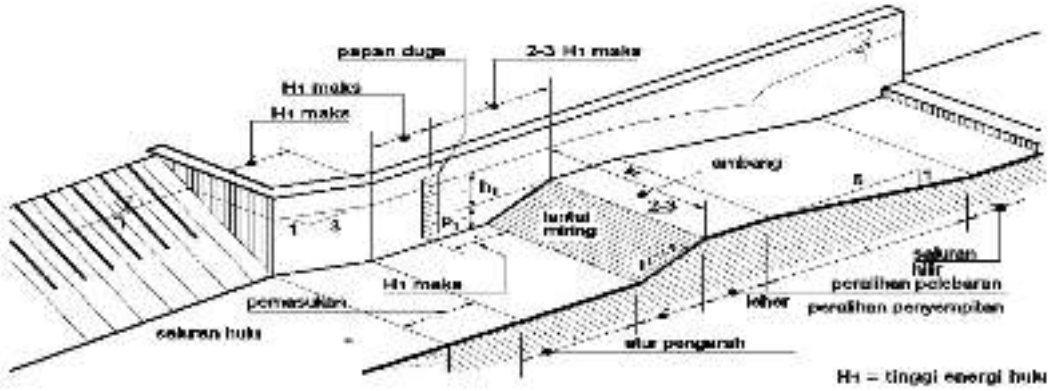
- Elev. dasar Sal. Sek. Belawa Hilir Ruas - 13 (di bangunan sadap) = + 12.20 m
- Elevasi Muka Air 100% di sal. Sek. Belawa Hilir Ruas - 13 = + 13.17 m

2. Data teknis saluran dan bangunan saluran tersier arah kanan (B.22 Ki 1)

- Elevasi dasar pintu sadap tersier = + 12.70 m
- Elev. dasar Saluran tersier di hilir pintu sadap = + 12.35
- Elevasi Muka Air di hilir pintu sadap = + 13.95 m
- Lebar pintu sadap tersier (B) = 0.40 m
- elevasi dasar saluran di hilir bangunan ukur = + 12.35
- elevasi muka air di hilir bangunan ukur = + 12.77

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.23 Ki

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. Menentukan tinggi muka air di atas ambang lebar (h)

- Data :

$Q_{tersier}$ = 0.089 m^3/dt

b_{ambang} = 0.30 m

- Perhitungan :

Rumus :

$$Q = 1{,}71 \times b \times h^{3/2}$$

Penyelesaian :

$$h = \left[\frac{Q}{1{,}71 \times b}\right]^{2/3}$$

$$= \left[\frac{0{,}089}{1{,}71 \times 0{,}30}\right]^{2/3}$$

$$= 0{,}31 \text{ m}$$

3. **Menentukan kehilangan energi di bangunan ukur ambang lebar (z)**

z = 1/2 h (min. 0,05 m)

= 0.50 x 0.31

= [illegible] m

4. **Menentukan Elevasi muka air tuntutan di saluran sekunder**

- Elevasi sawah tertinggi	=	12.30
- Genangan air di sawah	=	0.10
- Kehilangan energi dari saluran tersier ke sawah	=	0.05
- Kehilangan energi di sepanjang saluran tersier	=	0.0003
- Kehilangan energi di bangunan ukur	=	0.15
- Kehilangan energi di pintu sadap	=	0.10
- Kehilangan energi di saluran pembawa (0.10 $_{\text{[illegible]}}$)	=	0.004
Jadi elevasi muka air tuntutan di saluran induk Belawa (ujung hilir)	=	+ 12.71

[illegible]

[illegible]

5. **Menentukan [illegible]**

a. [illegible]

- [illegible] = [illegible] m
- [illegible] = [illegible] m
- [illegible] = + [illegible] m

b. [illegible]

[illegible]

[illegible]	=	[illegible]	[illegible]
[illegible]	=	[illegible]	m
[illegible]	=	[illegible]	m
[illegible]	=	[illegible]	m

- [illegible]

  [illegible]

  [illegible]

  [illegible]

  [illegible]

  [illegible]

  [illegible]

  [illegible]

  [illegible]

  [illegible]

  [illegible]

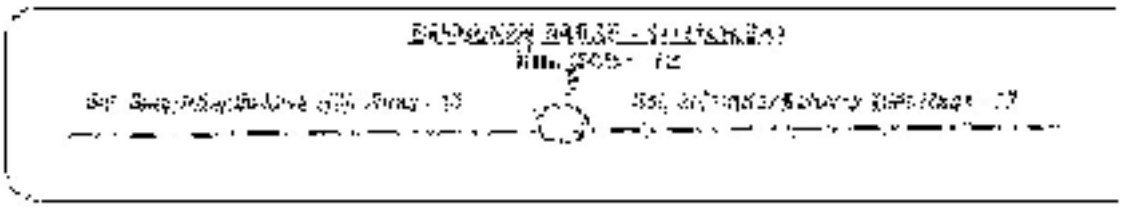
  [illegible]

- [illegible]

  [illegible]

  [illegible]

12. Bangunan Sadap Ki (N.S.2N)



PERHITUNGAN SALURAN PADA BANGUNAN SADAP

LOKASI	:	Desa [illegible]
P3A	:	[illegible]
SALURAN	:	Saluran Sekunder [illegible]

1 GETA DIMENSI SALURAN

1. Dimensi Saluran Sekunder Sebelum Bagi Tersier

A	=	[illegible]	ha
Q	=	1.950	m³/dt
v	=	0.69	m/dt
b	=	2.00	m
h	=	0.96	m
i	=	0.00026	
m	=	1.00	
k	=	60	
w	=	0.60	m

2. Dimensi SaluranTersier B B.24 Ki 1 Ruas 1

A	=	60.28	ha
Q	=	0.068	m³/dt
v	=	0.23	m/dt
b	=	0.50	m
h	=	0.35	m
i	=	[illegible]	
m	=	[illegible]	
k	=	[illegible]	
w	=	[illegible]	m

3. Dimensi Saluran Tersier B [illegible] Ruas [illegible]

A	=	[illegible]	ha
Q	=	[illegible]	m³/dt
v	=	[illegible]	m/dt
b	=	[illegible]	m
h	=	[illegible]	m
i	=	[illegible]	
m	=	[illegible]	
k	=	[illegible]	
w	=	[illegible]	m

4. **Dimensi SaluranTersier B B.24 Ki 3 Ruas 2**

A	=	47.00 ha
Q	=	0.052 m^3/dt
v	=	0.37 m/dt
b	=	0.40 m
h	=	0.36 m
i	=	0.0006
m	=	0.00
k	=	60
w	=	0.30 m

5. **Dimensi Saluran Sekunder Belawa Hilir Ruas 16**

A	=	1153.00 ha
Q	=	1.750 m^3/dt
v	=	0.65 m/dt
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

II. [illegible]

1. [illegible]

2. [illegible]

[illegible]	[illegible]	[illegible]	[illegible]
➪ Elev. dasar Saluran tersier di hilir pintu sadap	=	+	12.50
➪ Elevasi Muka Air di hilir pintu sadap	=	+	12.89 m
➪ Lebar pintu sadap tersier (B)	=		0.40 m
➪ elevasi dasar saluran di hilir bangunan ukur	=	+	12.40
➪ elevasi muka air di hilir bangunan ukur	=	+	12.75

3. **Data teknis saluran dan bangunan saluran tersier arah kanan (B.24 Ki 2)**

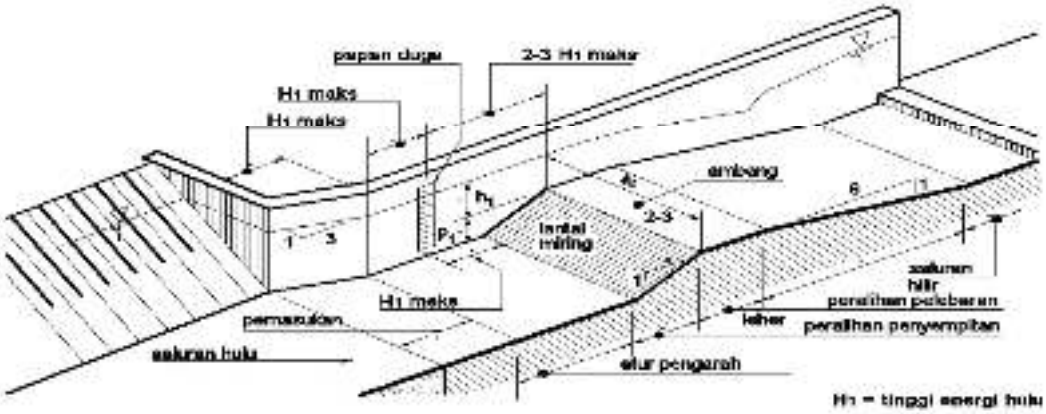
➪ Elevasi dasar pintu sadap tersier	=	+	12.60 m
➪ Elev. dasar Saluran tersier di hilir pintu sadap	=	+	12.60
➪ Elevasi Muka Air di hilir pintu sadap	=	+	12.92 m
➪ Lebar pintu sadap tersier (B)	=		0.50 m
➪ elevasi dasar saluran di hilir bangunan ukur	=	+	12.60
➪ elevasi muka air di hilir bangunan ukur	=	+	12.81

4. **Data teknis saluran dan bangunan saluran tersier arah kanan (B.24 Ki 3)**

⇨ Elevasi dasar pintu sadap tersier	=	+	12.60 m
⇨ Elev. dasar Saluran tersier di hilir pintu sadap	=	+	12.60
⇨ Elevasi Muka Air di hilir pintu sadap	=	+	12.96 m
⇨ Lebar pintu sadap tersier (B)	=		0.30 m
⇨ Elevasi dasar saluran di hilir bangunan ukur	=	+	12.60
⇨ Elevasi muka air di hilir bangunan ukur	=	+	12.90

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.24 Ki 1

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. Menentukan tinggi muka air di atas ambang lebar (h)

⇨ Data

$Q_{tersier}$ = 0.068 m^3/dt

b_{ambang} = 0.30 m

⇨ Perhitungan :

Rumus :

$$Q = 1.71 \times b \times h^{3/2}$$

Penyelesaian :

$$h = \left[\frac{Q}{1.71 \times b}\right]^{2/3}$$

$$= \left[\frac{0.068}{1.71 \times 0.30}\right]^{2/3}$$

$$= 0.26 \text{ m}$$

3. Menentukan kehilangan energi di bangunan ukur ambang lebar (z)

z = 1/2 h (min 0,05 m)

= 0.50 x 0.26

= [illegible] m

4. Menentukan Elevasi muka air tuntutan di saluran sekunder

- Elevasi sawah tertinggi	=	12.35
- Genangan air di sawah	=	0.10
- Kehilangan energi dari saluran tersier ke sawah	=	0.05
- Kehilangan energi di sepanjang saluran tersier	=	0.0003
- Kehilangan energi di bangunan ukur	=	0.13
- Kehilangan energi di pintu sadap	=	0.10
- Kehilangan energi di saluran pembawa (0.10 $_{\text{[illegible]}}$)	=	0.004
Jadi elevasi muka air tuntutan di saluran induk Belawa (ujung hilir)	=	+ 12.72

[illegible]

[illegible]

5. [illegible]

a. [illegible]

- [illegible] = [illegible] m
- [illegible] = [illegible] m
- [illegible] = + [illegible] m

b. [illegible]

[illegible]

[illegible] = [illegible] m

[illegible] = [illegible] m

[illegible] = [illegible] m

[illegible] = [illegible] m

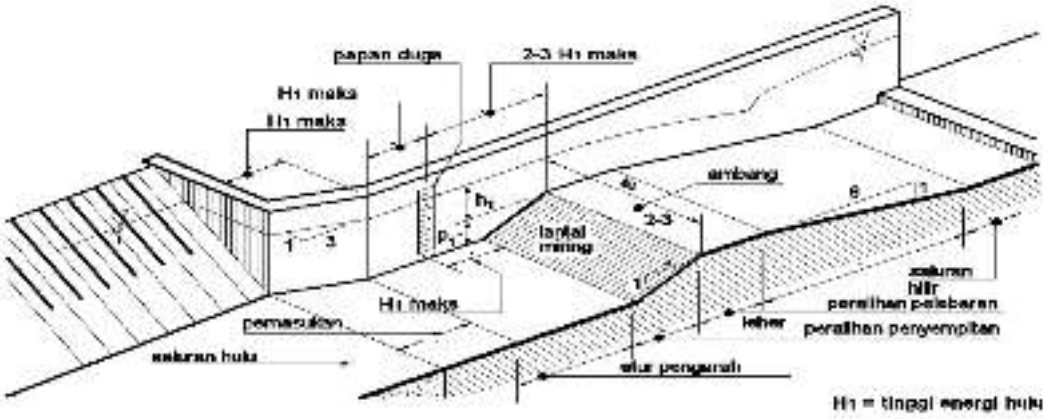
[illegible]

[illegible]

[illegible]

IV. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.24 KI 2

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. Menentukan tinggi muka air di atas ambang lebar (h)

⇨ Data

$Q_{tersier}$ = 0.033 m^3/dt

b_{ambang} = 0.30 m

⇨ Perhitungan :

Rumus :

$Q = 1{,}71 \times b \times h^{3/2}$

Penyelesaian :

$$h = \left[\frac{Q}{1{,}71 \times b}\right]^{2/3}$$

$$= \left[\frac{0.033}{1.71 \times 0.30}\right]^{2/3}$$

$$= 0.16 \text{ m}$$

3. Menentukan kehilangan energi di bangunan ukur ambang lebar (z)

z = 1/2 h (min. 0,05 m)

= 0.50 x 0.16

= 0.08 m

4. Menentukan Elevasi muka air tuntutan di saluran sekunder

- Elevasi sawah tertinggi	=	12.55
- Genangan air di sawah	=	0.10
- Kehilangan energi dari saluran tersier ke sawah	=	0.05
- Kehilangan energi di sepanjang saluran tersier	=	0.0002
- Kehilangan energi di bangunan ukur	=	0.08
- Kehilangan energi di pintu sadap	=	0.10
- Kehilangan energi di saluran pembawa (0.10 $_{\text{Intake}}$)	=	0.01
- Jadi elevasi muka air tuntutan di saluran sek. Belawa ruas - 15	=	+ 12.99

Dari perhitungan elevasi muka air di saluran sek. Belawa Ruas -15

didapat elevasi muka air pada kondisi 100% + 12.96

FMA 100% > FMA tuntutan **OK**

[illegible]

[illegible]

[illegible]

[illegible]

- [illegible]

  [illegible] = [illegible]

  = [illegible] m

  [illegible]

  [illegible] = [illegible]

  [illegible] = [illegible] / [illegible]

  = [illegible] m

  [illegible]

  [illegible] = [illegible]

  [illegible]

  [illegible] = [illegible]

  [illegible]

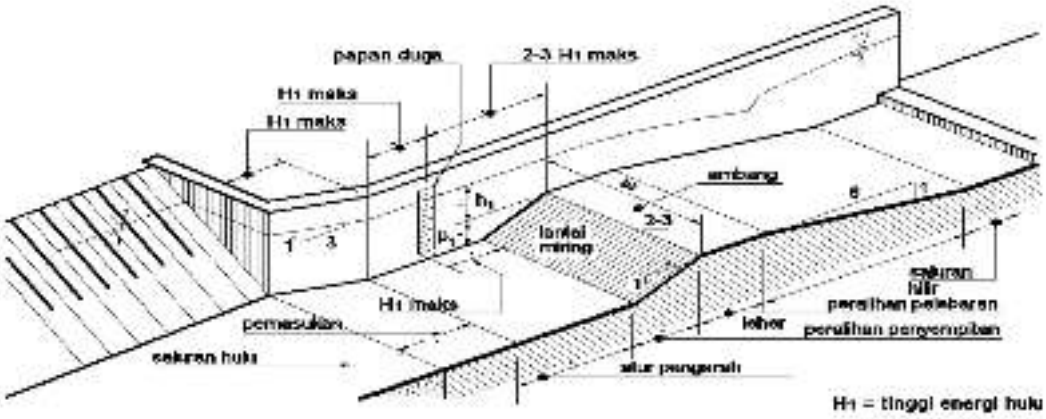
  = [illegible] m

- [illegible]

  [illegible]

IV. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.24 KI 3

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

$$= \left[\frac{0.052}{1.71 \times 0.30} \right]^{2/3}$$

$$= 0.22 \text{ m}$$

3. Menentukan kehilangan energi di bangunan ukur ambang lebar (z)

$z = 1/2\ h_1$ (min. 0.05 m)

$= 0.50 \times 0.22$

$= 0.11$ m

4. Menentukan Elevasi muka air tuntutan di saluran sekunder

- Elevasi sawah tertinggi	=	12.55
- Genangan air di sawah	=	0.10
- Kehilangan energi dari saluran tersier ke sawah	=	0.05
- Kehilangan energi di sepanjang saluran tersier	=	0.0006
- Kehilangan energi di bangunan ukur	=	0.11
- Kehilangan energi di pintu sadap	=	0.10
- Kehilangan energi di saluran pembawa (0.10 $h_{100\%}$)	=	0.00
- Jadi elevasi muka air tuntutan di saluran sek. Belawa ruas - 15	=	+ 12.91

Dari perhitungan elevasi muka air di saluran sek. Belawa Ruas -15

didapat elevasi muka air pada kondisi 100% + 12.98

EMA 100% > EMA tuntutan **OK**

[illegible]

[illegible]

[illegible]

- Dimensi [illegible]

[illegible]

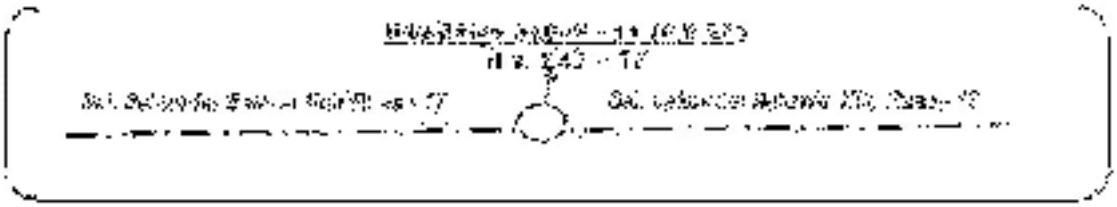
- [illegible]

[illegible]

[illegible]

[

11. Bangunan Bagi/Sadap 19 (B.B.29)



Saluran Induk Hilir (S.I.) Saluran Induk

Lokasi	:	Bangunan (B.B.29)
H.L	:	[illegible]
Saluran	:	Petak Tersier Kiri Ruas [illegible]

I. DATA TIPE SALURAN

1. Dimensi Saluran Sekunder Petakan Hilir Ruas 17

A	=	1,559.00 ha
Q	=	1.750 m^3/dt
v	=	0.71 m/dt
b	=	2.00 m
h	=	0.86 m
i	=	0.0003
m	=	1.00
k	=	60
w	=	0.60 m

2. Dimensi Saluran Tersier B B.25 Ruas 1

A	=	14.82 ha
Q	=	0.017 m^3/dt
v	=	0.22 m/dt
b	=	0.40 m
h	=	0.18 m
i	=	0.0003
m	=	1.00
k	=	60
w	=	0.30 m

3. Dimensi Saluran Sekunder Petakan Hilir Ruas 16

A	=	1,571.00 ha
Q	=	1.570 m^3/dt
v	=	0.68 m/dt
b	=	2.00 m
h	=	0.83 m
i	=	0.0003
m	=	1.00
k	=	60
w	=	0.60 m

II. DATA TEKNIS SALURAN DAN BANGUNAN

1. Data teknis saluran dan bangunan di saluran Sekender Belawa Hilir Ruas -17

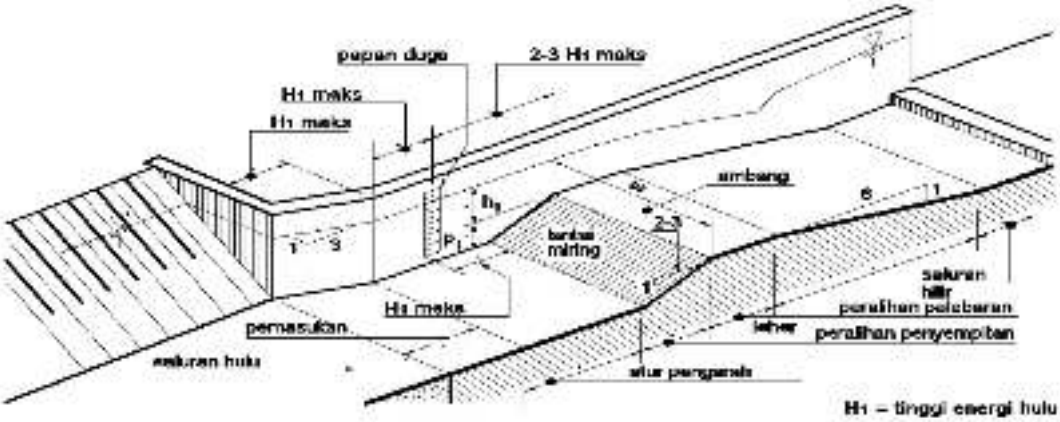
- Elev. dasar Sal. Sek. Belawa Hilir Ruas - 17 (di cangunan sadap = + 11.60 m
- Elevasi Muka Air 100% di sal. Sek. Belawa Hilir Ruas - 17 = + 12.63 m

2. Data teknis saluran dan bangunan saluran tersier arah (B.B.25)

- Elevasi dasar pintu sadap tersier = + 11.95 m
- Elev. dasar Saluran tersier di hilir pintu sadap = + 11.75
- Elevasi Muka Air di hilir pintu sadap = + 12.05 m
- Lebar pintu sadap tersier (B) = 0.60 m
- elevasi dasar saluran di hilir bangunan ukur = + 11.65
- elevasi muka air di hilir cangunan ukur = + 11.83

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.25

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



[illegible]

$$= \left[\frac{0.017}{1.71 \times 0.40} \right]^{2/3}$$

$$= 0.09 \text{ m}$$

3. **Menentukan kehilangan energi di bangunan ukur ambang lebar (z)**

$$z = 1/2\ h \ (\text{min. } 0{,}05 \text{ m})$$

$$= 0.50 \times 0.09$$

$$= 0.04 \text{ m}$$

4. **Menentukan Elevasi muka air tuntutan di saluran sekunder**

- Elevasi pintu tersier	=	[illegible]
- Kehilangan air di pintu	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]

[illegible]

[illegible]

[illegible]

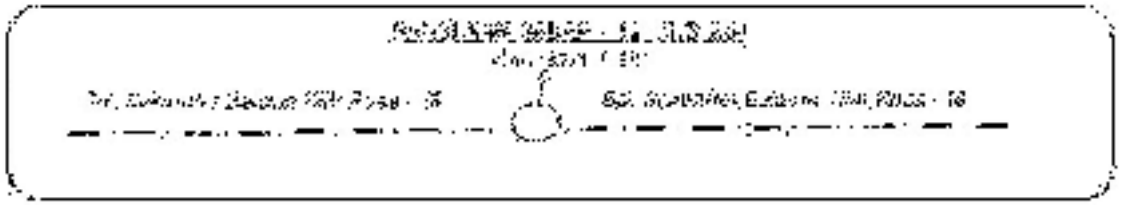
[illegible]

[illegible]

[illegible]

[illegible]

12. [illegible]



[illegible]

[illegible]	:	[illegible]
[illegible]	:	[illegible]
[illegible]	:	[illegible]

I. [illegible]

1. Dimensi Saluran [illegible] Ruas [illegible]

A	=	[illegible] ha
Q	=	1.530 m³/dt
v	=	0.65 m/dt
b	=	2.00 m
h	=	0.83 m
i	=	0.00026
m	=	1.00
k	=	60
w	=	0.60 m

2. **Dimensi SaluranTersier B B.26 Ki Ruas 1**

A	=	17.14 ha
Q	=	0.019 m³/dt
v	=	0.19 m/dt
b	=	0.70 m
h	=	0.15 m
i	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible] m

3. Dimensi Saluran Sekunder [illegible] Ruas [illegible]

[illegible]	=	[illegible] ha
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible] m

II. DATA TEKNIS SALURAN DAN BANGUNAN

1. Data teknis saluran dan bangunan di saluran Sekender Belawa Hilir Ruas -18

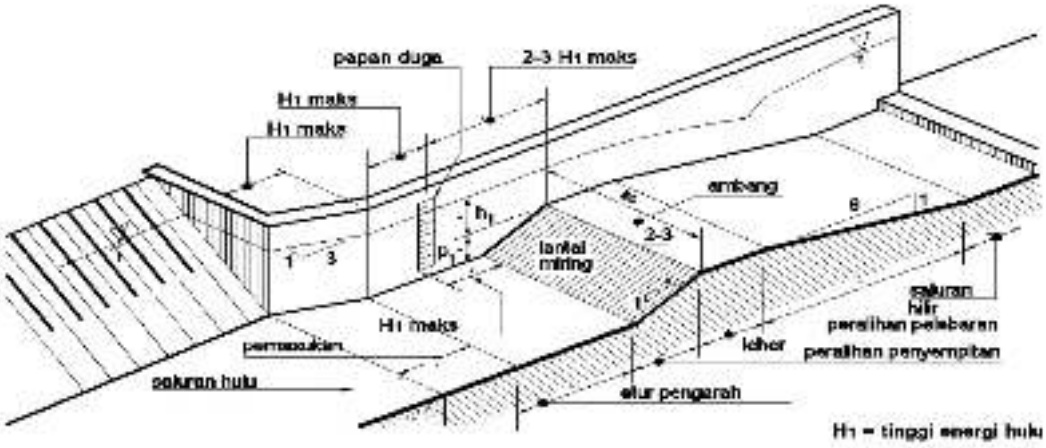
- Elev. dasar Sal. Sek. Belawa Hilir Ruas - 18 (di bangunan sadap) = + 11.80 m
- Elevasi Muka Air 100% di sal. Sek. Belawa Hilir Ruas - 18 = + 12.43 m

2. Data teknis saluran dan bangunan saluran tersier arah kanan (B.26 Ki)

- Elevasi dasar pintu sadap tersier = + 11.90 m
- Elev. dasar Saluran tersier di hilir pintu sadap = + 11.90
- Elevasi Muka Air di hilir pintu sadap = + 12.21 m
- Lebar pintu sadap tersier (B) = 0.50 m
- elevasi dasar saluran di hilir bangunan ukur = + 11.90
- elevasi muka air di hilir bangunan ukur = + 12.05

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.26 Ki

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

$$= \left[\frac{0.019}{1.71 \times 0.30} \right]^{2/3}$$

$$= 0.11 \text{ m}$$

3. **Menentukan kehilangan energi di bangunan ukur ambang lebar (z)**

$$z = 1/2\ h \ (\text{min } 0{,}05 \text{ m})$$

$$= 0.50 \times 0.11$$

$$= 0.06 \text{ m}$$

4. **Menentukan Elevasi muka air tuntutan di saluran sekunder**

- Elevasi sawah tertinggi	=	11.85
- Genangan air di sawah	=	0.10
- Kehilangan energi dari saluran tersier ke sawah	=	0.15
- Kehilangan energi di saluran tersier	=	[illegible]
- Kehilangan energi di bangunan [illegible]	=	[illegible]
- Kehilangan energi pintu sadap	=	0.12
- Kehilangan energi di saluran primer (0.12 [illegible])	=	[illegible]
- [illegible]	=	12.[illegible]

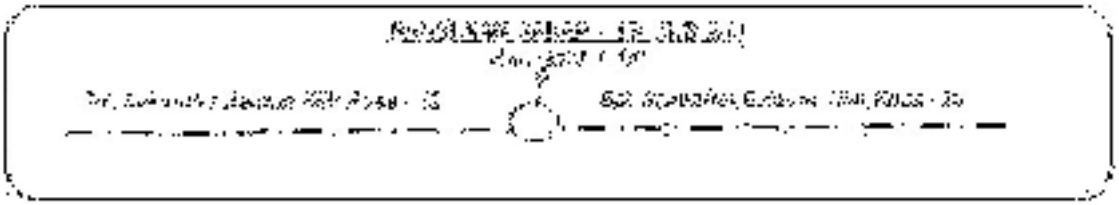
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]	:	[illegible]
[illegible]	:	[illegible]
[illegible]	:	[illegible]

I. DATA DIMENSI SALURAN

1. Dimensi saluran [illegible]

A	=	[illegible] ha
Q	=	1.290 m³/dt
v	=	0.62 m/dt
b	=	1.80 m
h	=	0.80 m
i	=	0.00026
m	=	1.00
k	=	60
w	=	0.50 m

2. **Dimensi SaluranTersier B B.27 Ki Ruas 1**

A	=	44.00 ha
Q	=	0.062 m³/dt
v	=	0.21 m/dt
b	=	0.60 m
h	=	0.33 m
i	=	[illegible]
m	=	[illegible]
k	=	[illegible]
w	=	[illegible] m

3. [illegible]

A	=	[illegible] ha
Q	=	[illegible] m³/dt
v	=	[illegible] m/dt
b	=	[illegible] m
h	=	[illegible] m
i	=	[illegible]
m	=	[illegible]
k	=	[illegible]
w	=	[illegible] m

II. DATA TEKNIS SALURAN DAN BANGUNAN

1. Data teknis saluran dan bangunan di saluran Sekender Belawa Hilir Ruas -19

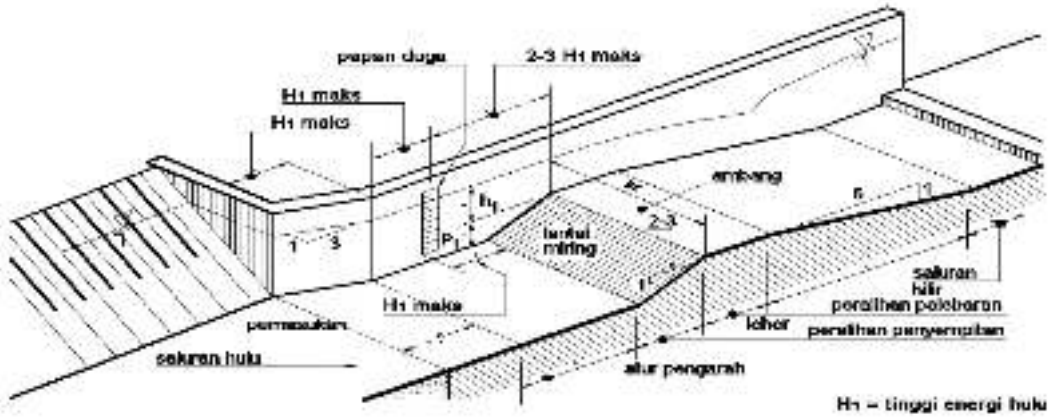
- Elev. dasar Sal. Sek. Belawa Hilir Ruas - 19 (di bangunan sadap) = + 11.82 m
- Elevasi Muka Air 100% di sal. Sek. Belawa Hilir Ruas - 19 = + 12.37 m

2. Data teknis saluran dan bangunan saluran tersier arah Kiri (B.27 Ki)

- Elevasi dasar pintu sadap tersier = + 11.82 m
- Elev. dasar Saluran tersier di hilir pintu sadap = + 11.52
- Elevasi Muka Air di hilir pintu sadap = + 11.97 m
- Lebar pintu sadap tersier (B) = 0.50 m
- elevasi dasar saluran di hilir bangunan ukur = + 11.52
- elevasi muka air di hilir bangunan ukur = + 11.85

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.27 Ki

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. **Menentukan tinggi muka air di atas ambang lebar (h)**

➪ Data

$Q_{tersier}$ = 0.062 m^3/dt

b_{ambang} = 0.30 m

➪ Perhitungan :

Rumus :

$Q = 1.71 \times b \times h^{3/2}$

Penyelesaian :

$$h = \left(\frac{Q}{1.71 \times b} \right)^{2/3}$$

$$= \left(\frac{0.062}{1.71 \times 0.30} \right)^{2/3}$$

= 0.24 m

3. **Menentukan kehilangan energi di bangunan ukur ambang lebar (z)**

z = 1/2 h (min 0,05 m)

= 0.50 x 0.24

= [illegible] m

4. **Menentukan Elevasi muka air tuntutan di saluran sekunder**

- Elevasi sawah tertinggi	=	11.47
- Genangan air di sawah	=	0.10
- Kehilangan energi dari saluran tersier ke sawah	=	0.06
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

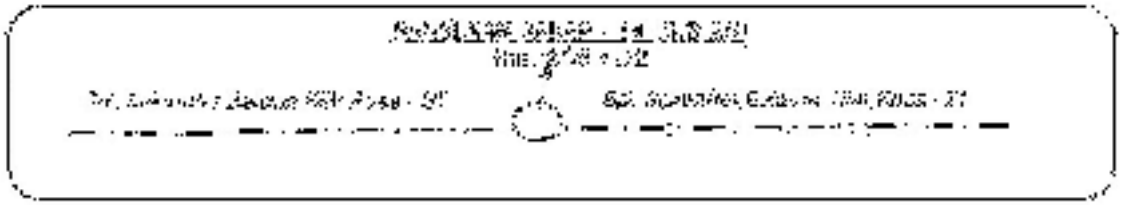
[illegible]

[illegible]

[illegible]

[illegible]

[illegible] Saddang 1-1 (B.3.28)



PERHITUNGAN HIDROLOGI DAERAH

LOKASI	:	Sawap (B.3.28)
Luas	:	258 (Ha)
SALURAN	:	Saluran Sawap Hilir Ruas - 20

I. DATA DIMENSI SALURAN

1. Dimensi Saluran Sawap Hilir Ruas 20

A	=	[illegible] ha
Q	=	1.210 m^3/dt
v	=	0.64 m/dt
b	=	1.80 m
h	=	0.75 m
i	=	0.0003
m	=	1.00
k	=	60
w	=	0.50 m

2. Dimensi SaluranTersier B B.28 Ka Ruas 1

A	=	63.00 ha
Q	=	0.088 m^3/dt
v	=	0.33 m/dt
b	=	0.60 m
h	=	0.45 m
i	=	0.0002
m	=	[illegible]
k	=	[illegible]
w	=	[illegible] m

3. Dimensi Saluran Sawap Hilir Ruas 20

A	=	[illegible] ha
Q	=	[illegible]
v	=	[illegible]
b	=	[illegible] m
h	=	[illegible] m
i	=	[illegible]
m	=	[illegible]
k	=	[illegible]
w	=	[illegible] m

II. DATA TEKNIS SALURAN DAN BANGUNAN

1. Data teknis saluran dan bangunan di saluran Sekender Belawa Hilir Ruas -20

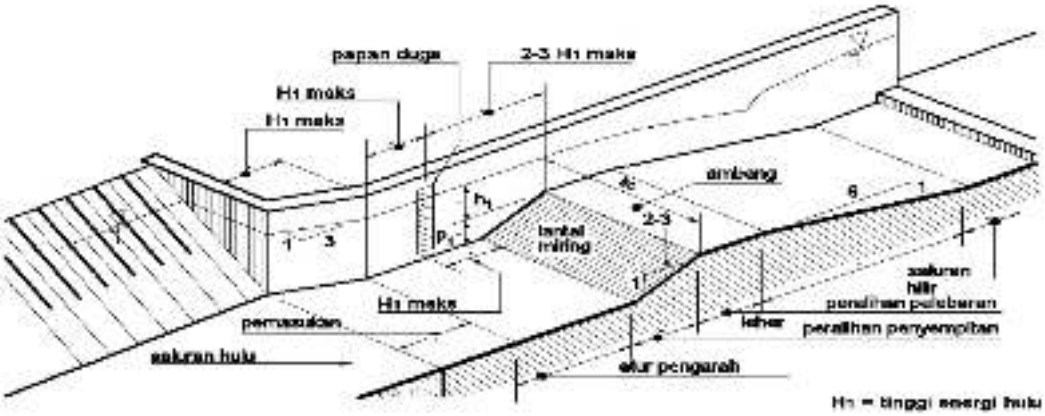
- Elev. dasar Sal. Sek. Belawa Hilir Ruas - 20 (di bangunan sadap) = + 11.40 m
- Elevasi Muka Air 100% di sal. Sek. Belawa Hilir Ruas - 20 = + 12.15 m

2. Data teknis saluran dan bangunan saluran tersier arah Kanan (B.28 Ka)

- Elevasi dasar pintu sadap tersier = + 11.70 m
- Elev. dasar Saluran tersier di hilir pintu sadap = + 11.45
- Elevasi Muka Air di hilir pintu sadap = + 11.97 m
- Lebar pintu sadap tersier (B) = 0.50 m
- elevasi dasar saluran di hilir bangunan ukur = + 11.45
- elevasi muka air di hilir bangunan ukur = + 11.90

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.28 Ka

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

$$= \left[\frac{0.088}{1.71 \quad x \quad 0.30} \right]^{2/3}$$

$$= 0.31 \text{ m}$$

3. **Menentukan kehilangan energi di bangunan ukur ambang lebar (z)**

z = 1/2 h (min. 0,05 m)

= 0.50 x 0.31

= 0.15 m

4. **Menentukan Elevasi muka air tuntutan di saluran sekunder**

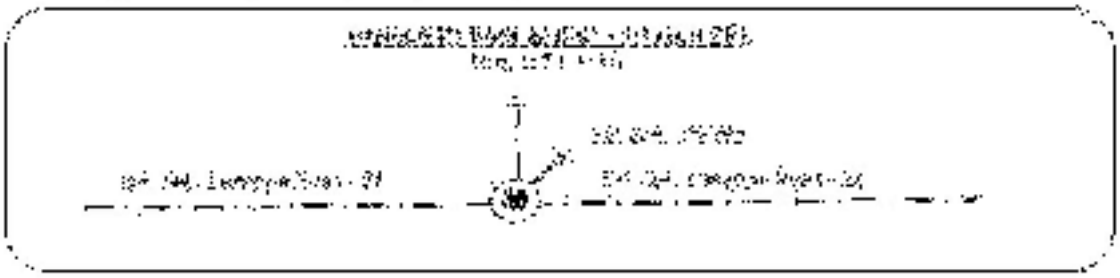
- Elevasi sawah tertinggi	=	11.4
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]

[illegible]

[illegible]

[illegible]

[illegible] Bangunan Bagi Sadap 16 (S 0.29)



PERHITUNGAN HIDROLIS BANGUNAN BAGI

UPTAS	:	Bangunan Bagi Sadap (0.0 38)
PPA	:	[illegible]
SALURAN	:	Saluran Sekunder Bonto Bila Kiri (1)

I. DATA DISAIN SALURAN

A. [illegible]

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

B. [illegible]

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

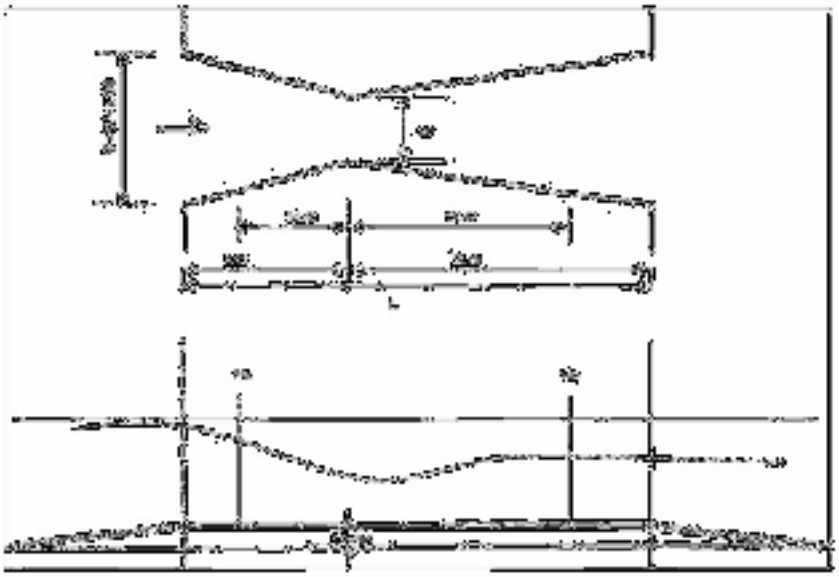
C. [illegible]

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]



2. [illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

[illegible]

[illegible]

[illegible] = [illegible] ——> [illegible]

3. [illegible]

a. [illegible]

- [illegible] = [illegible]
- [illegible] = [illegible]
- [illegible] = [illegible]

b. [illegible]

[illegible]

[illegible]	=	[illegible]	[illegible]
[illegible]	=	[illegible]	m
[illegible]	=	[illegible]	m
[illegible]	=	[illegible]	m

c. [illegible]

[illegible]

= [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

d. [illegible]

[illegible] = [illegible]

[illegible]

[illegible]

[illegible]

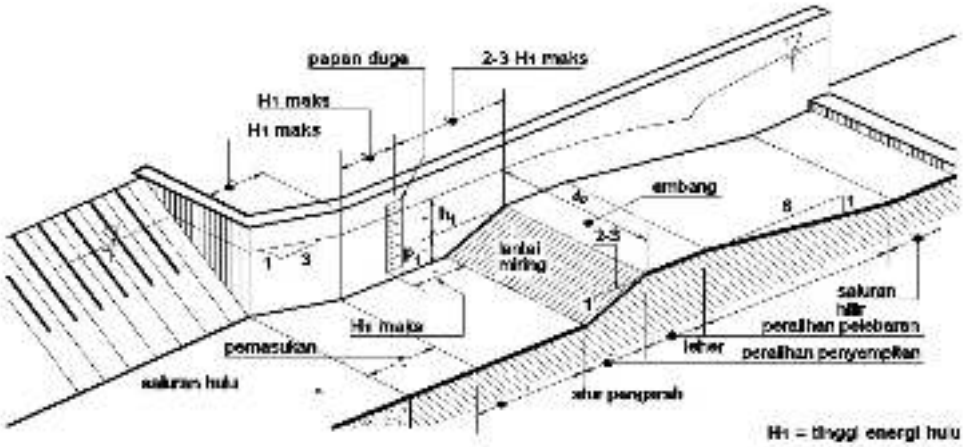
e. [illegible]

[illegible] = [illegible]

[illegible]

IV. PERHITUNGAN HIDROLIS BANGUNAN SADAP KEARAH SALURAN TERSIER B.B.29 Ka 1

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. Menentukan tinggi muka air di atas ambang lebar (h)

⇨ Data

$Q_{tersier}$ = 0.0350 m^3/dt

b_{ambang} = 0.30 m

⇨ Perhitungan :

Rumus :

$Q = 1,71 \times b \times h^{3/2}$

Penyelesaian :

$$h = \left[\frac{Q}{1,71 \times b}\right]^{2/3}$$

$$h = \left[\frac{0.0350}{1.71 \times 0.30}\right]^{2/3}$$

$$h = 0.07 \text{ m}$$

3. [illegible]

[illegible]

$= 0.08$ m

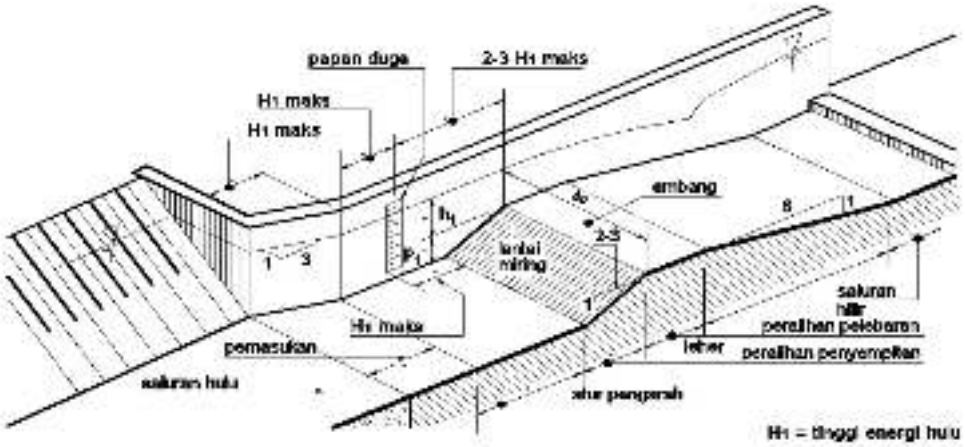
[illegible]

[illegible]

[illegible]

V. PERHITUNGAN HIDROLIS BANGUNAN SADAP KEARAH SALURAN TERSIER B.B.29 Ka 2

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. Menentukan tinggi muka air di atas ambang lebar (h)

⇨ Data

$Q_{tersier}$ = 0.0350 m^3/dt

b_{ambang} = 0.30 m

⇨ Perhitungan :

Rumus :

$Q = 1,71 \times b \times h^{3/2}$

Penyelesaian :

$$h = \left[\frac{Q}{1,71 \times b}\right]^{2/3}$$

$$h = \left[\frac{0.0350}{1.71 \times 0.30}\right]^{2/3}$$

$$h = 0.217 \text{ m}$$

3. Tinggi muka air di atas ambang lebar (h)

h = [illegible]

= [illegible] x [illegible]

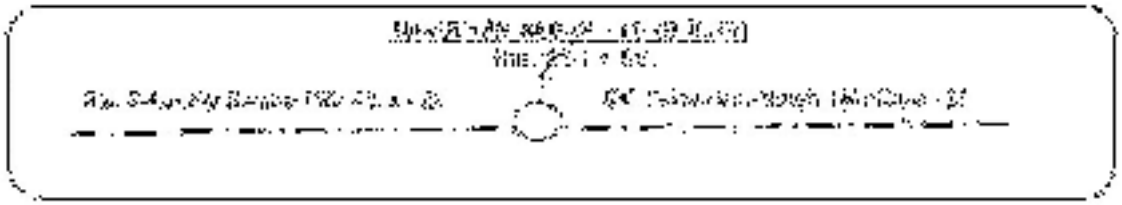
= 0.08 m

[illegible]

[illegible]

[illegible]

[illegible]



PERHITUNGAN HIDROLIS SALURAN SEKUNDER

[illegible]	:	[illegible]
[illegible]	:	[illegible]
[illegible]	:	[illegible]

I. DATA DIMENSI SALURAN

1. Dimensi Saluran Sekunder Bendung Mada B2

A	=	50.00 ha
Q	=	0.120 m³/dt
v	=	0.40 m/dt
b	=	1.40 m
h	=	0.21 m
i	=	0.00029
m	=	0.00
k	=	60
w	=	0.40 m

2. Dimensi SaluranTersier B B.30 Ka Ruas 1

A	=	53.00 ha
Q	=	0.074 m³/dt
v	=	0.32 m/dt
b	=	0.80 m
h	=	0.29 m
i	=	0.0002
m	=	[illegible]
k	=	[illegible]
w	=	[illegible] m

3. Dimensi Saluran Sekunder Bendung Mada B2

A	=	[illegible] ha
Q	=	[illegible] m³/dt
v	=	[illegible] m/dt
b	=	[illegible] m
h	=	[illegible] m
i	=	[illegible]
m	=	0.00
k	=	[illegible]
w	=	[illegible] m

II. DATA TEKNIS SALURAN DAN BANGUNAN

1. Data teknis saluran dan bangunan di saluran Sekender Belawa Hilir Ruas -22

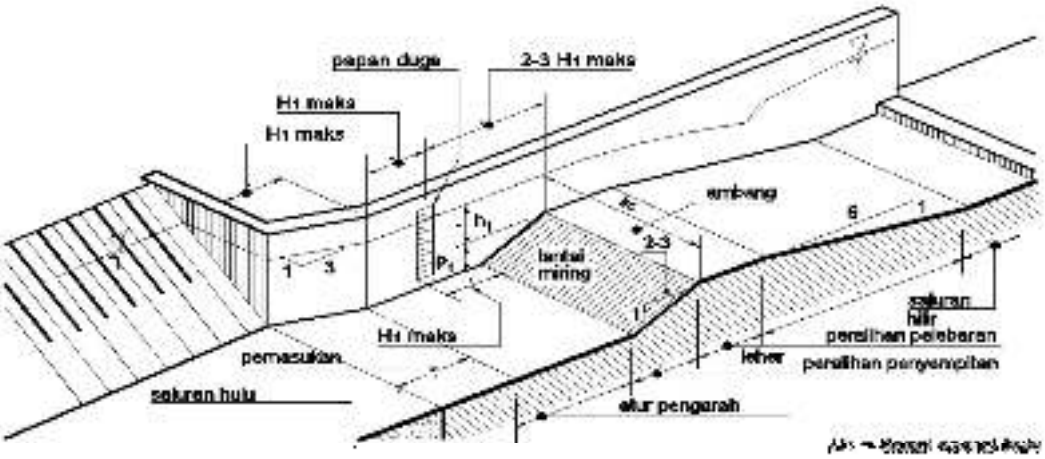
- Elev. dasar Sal. Sek. Belawa Hilir Ruas - 22 (di bangunan sadap) = + 10.49 m
- Elevasi Muka Air 100% di sal. Sek. Belawa Hilir Ruas - 22 = + 10.63 m

2. Data teknis saluran dan bangunan saluran tersier arah Kanan (B.30 Ka)

- Elevasi dasar pintu sadap tersier = + 10.53 m
- Elev. dasar Saluran tersier di hilir pintu sadap = + 9.72
- Elevasi Muka Air di hilir pintu sadap = + 10.20 m
- Lebar pintu sadap tersier (B) = 0.50 m
- elevasi dasar saluran di hilir bangunan ukur = + 9.62
- elevasi muka air di hilir bangunan ukur = + 9.91

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.30 Ka

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. Menentukan tinggi muka air di atas ambang lebar (h)

⇨ Data

$Q_{tersier}$ = 0.074 m^3/dt

b_{ambang} = 0.30 m

⇨ Perhitungan :

Rumus :

$Q = 1.71 \times b \times h^{3/2}$

Penyelesaian :

$$h = \left[\frac{Q}{1.71 \times b}\right]^{2/3}$$

$$= \left[\frac{0.074}{1.71 \times 0.30}\right]^{2/3}$$

= 0.28 m

3. Menentukan kehilangan energi di bangunan ukur ambang lebar (z)

z = 1/2 h (min 0,05 m)

= 0.50 x 0.28

= [illegible] m

4. Menentukan Elevasi muka air tuntutan di saluran sekunder

- Elevasi sawah tertinggi	=	0.57
- Genangan air di sawah	=	0.10
- Kehilangan energi dari saluran tersier ke sawah	=	0.06
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

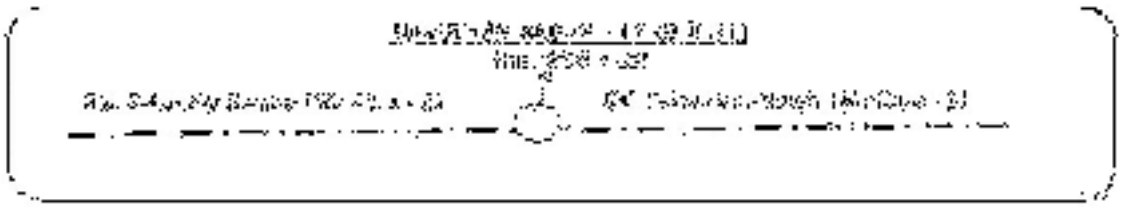
[illegible]

[illegible]

[illegible]

[illegible]

17. [illegible]



[illegible]

[illegible]	:	[illegible]
[illegible]	:	[illegible]
[illegible]	:	[illegible]

1 [illegible]

1. [illegible]

A	=	[illegible] ha
Q	=	0.070 m^3/dt
v	=	0.37 m/dt
b	=	1.20 m
h	=	0.16 m
i	=	0.00059
m	=	0.00
k	=	60
w	=	0.50 m

2. **Dimensi SaluranTersier B B.31 Ka Ruas 1**

A	=	24.22 ha
Q	=	0.034 m^3/dt
v	=	0.23 m/dt
b	=	1.20 m
h	=	0.13 m
i	=	0.0003
m	=	0.00
k	=	60
w	=	0.30 m

3. **Dimensi Saluran Sekunder Belawa Hilir Ruas 24**

A	=	47.15 ha
Q	=	0.066 m^3/dt
v	=	0.29 m/dt
b	=	1.20 m
h	=	0.19 m
i	=	0.0003
m	=	0.00
k	=	60
w	=	0.30 m

II. DATA TEKNIS SALURAN DAN BANGUNAN

1. Data teknis saluran dan bangunan di saluran Sekender Belawa Hilir Ruas -23

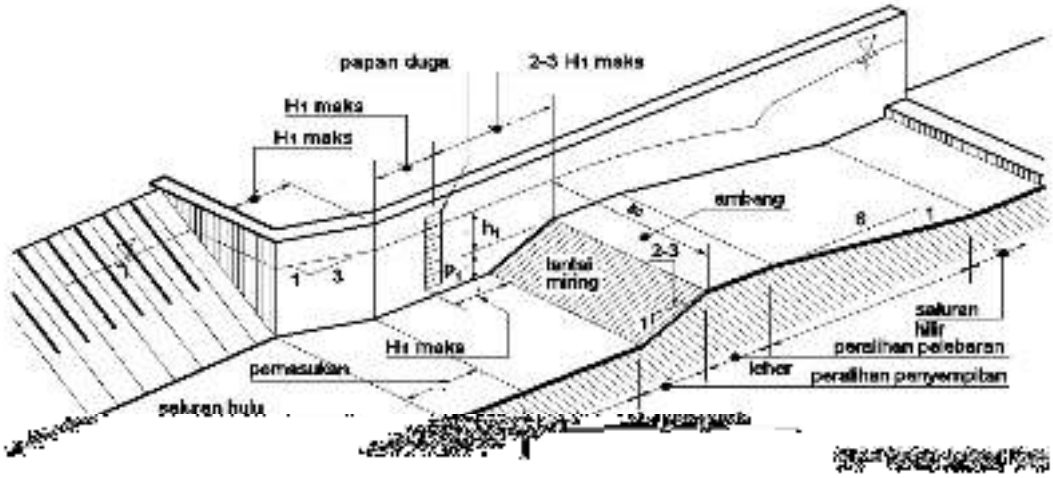
- Elev. dasar Sal. Sek. Belawa Hilir Ruas - 23 (di bangunan sadap) = + 9.73 m
- Elevasi Muka Air 100% di sal. Sek. Belawa Hilir Ruas - 23 = + 10.16 m

2. Data teknis saluran dan bangunan saluran tersier arah Kanan (B.31 Ka)

- Elevasi dasar pintu sadap tersier = + 9.93 m
- Elev. dasar Saluran tersier di hilir pintu sadap = + 9.68
- Elevasi Muka Air di hilir pintu sadap = + 9.70 m
- Lebar pintu sadap tersier (B) = 0.40 m
- elevasi dasar saluran di hilir bangunan ukur = + 9.33
- elevasi muka air di hilir bangunan ukur = + 9.46

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.30 Ka

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. **Menentukan tinggi muka air di atas ambang lebar (h)**

➪ Data

$Q_{tersier}$ = 0.034 m^3/dt

b_{ambang} = 0.30 m

➪ Perhitungan :

Rumus :

$Q = 1.71 \times b \times h^{3/2}$

Penyelesaian :

$$h = \left[\frac{Q}{1.71 \times b}\right]^{2/3}$$

$$= \left[\frac{0.034}{1.71 \times 0.30}\right]^{2/3}$$

$$= 0.16 \text{ m}$$

3. **Menentukan kehilangan energi di bangunan ukur ambang lebar (z)**

z = 1/2 h (min 0,05 m)

= 0.50 x 0.16

= 0.08 m

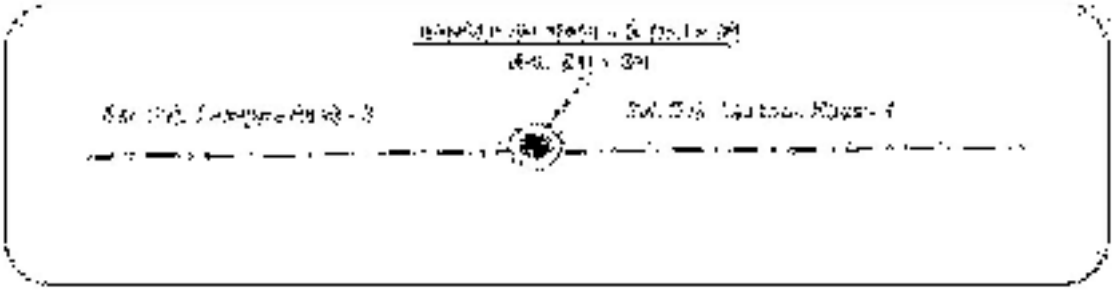
4. **Menentukan Elevasi muka air tuntutan di saluran sekunder**

- Elevasi sawah tertinggi	=	0.28
- Genangan air di sawah	=	0.10
- Kehilangan energi dari saluran tersier ke sawah	=	0.06
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]

[illegible]

[illegible]

[illegible] Bangunan Bagi 2 (B L3)



PERHITUNGAN HIDROLIS BANGUNAN BAGI

LOKASI	:	Bangunan Bagi (B.L 3/3)
HP	:	[illegible]
SALURAN	:	[illegible]

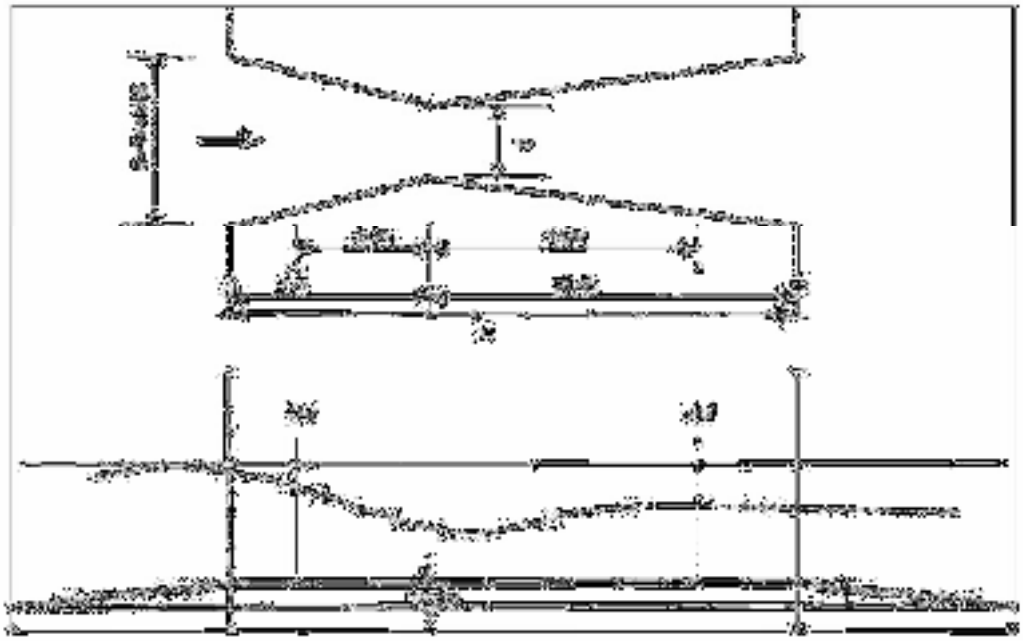
I. DATA DIMENSI SALURAN

A. Dimensi Saluran Sebelum Bangunan

A	=	[illegible]
Q	=	[illegible]
v	=	[illegible]
b	=	[illegible]
h	=	[illegible]
i	=	[illegible]
n	=	[illegible]
k	=	[illegible]
w	=	[illegible]

B. Dimensi Saluran Sesudah Bangunan

A	=	[illegible]
Q	=	[illegible]
v	=	[illegible]
b	=	[illegible]
h	=	[illegible]
i	=	[illegible]
m	=	[illegible]
k	=	[illegible]
w	=	[illegible]

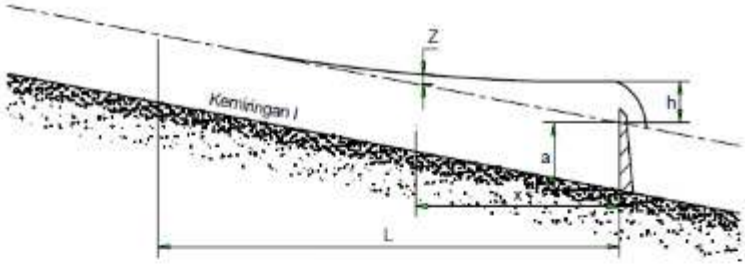


[illegible]

[illegible]

[illegible]

3. Perhitungan Panjang Pengempangan (L)



$$z = h\left(1 - \frac{x}{L}\right)^2$$

for $\frac{h}{a} \geq 1 \quad L = \frac{2h}{I}$

for $\frac{h}{a} \leq 1 \quad L = \frac{a+h}{I}$

dimana :

a	=	kedalaman air di saluran sebelum ada pengempangan
h	=	tinggi air pengempangan
L	=	panjang terjadinya pengempangan
z	=	kedalaman pengempangan pada jarak x dari awal pengempangan
x	=	jarak dari awal pengempangan
i	=	kemiringan dasar saluran

Perhitungan:

a	=	0.69 m
h	=	0.17 m
i	=	0.0011 m
h / a	=	0.245 < 1
L	=	(a + h) / i
	=	818.1 m

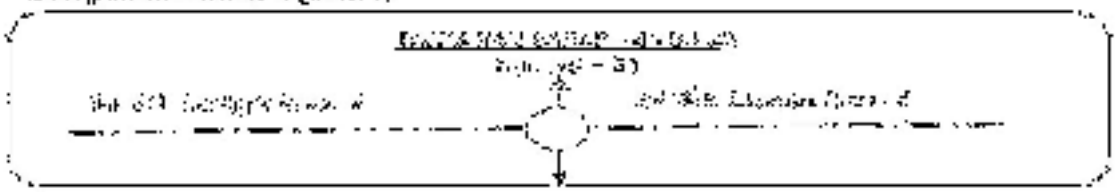
panjang pengempangan (L) = 818.1 m

[illegible]

[illegible]

[illegible]

13. [illegible]



[illegible]

[illegible]	:	[illegible]
[illegible]	:	[illegible]
[illegible]	:	[illegible]

1. [illegible]

a. [illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

b. [illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

c. [illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

II [illegible]

1. [illegible]
   - [illegible]
   - [illegible]

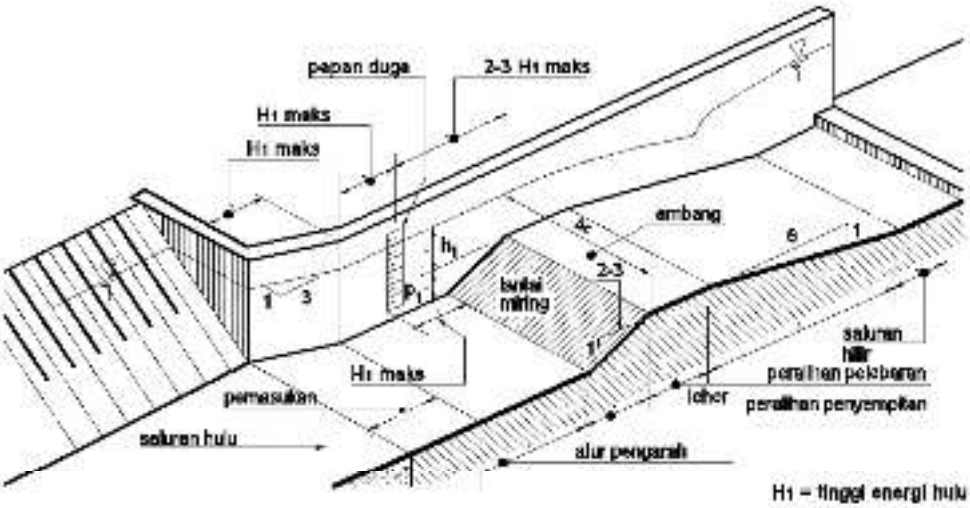
2. [illegible]
   - [illegible]
   - [illegible]
   - [illegible]
   - [illegible]
   - [illegible]
   - [illegible]

3. [illegible]
   - [illegible]
   - [illegible]
   - [illegible]
   - [illegible]
   - [illegible]
   - [illegible]

4. [illegible]
   - [illegible]
   - [illegible]
   - [illegible]
   - [illegible]
   - [illegible]
   - [illegible]

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. Menentukan tinggi muka air di atas ambang lebar (h)

⇨ Data :

$Q_{tersier}$ = 0.0290 m^3/dt

b_{ambang} = 0.50 m

⇨ Perhitungan :

Rumus :

$Q = 1{,}71 \times b \times h^{3/2}$

Penyelesaian :

$$h = \left[\frac{Q}{1{,}71 \times b}\right]^{2/3}$$

$$= \left[\frac{0{,}0290}{1{,}71 \times 0{,}50}\right]^{2/3}$$

$$= 0{,}0[illegible]\ m$$

3. Menentukan [illegible] di hilir bangunan ukur ambang lebar

$$h = [illegible]$$

$$= 0{,}[illegible} \times 0{,}[illegible}$$

$$= 0{,}[illegible}\ m$$

4. Menentukan Elevasi muka air tuntutan di saluran sekunder

- Elevasi sawah tertinggi	=	20.2
- Genangan air di sawah	=	0.1
- Kehilangan energi dari saluran tersier ke sawah	=	0.0
- Kehilangan energi di sepanjang saluran tersier	=	0.2
- Kehilangan energi di bangunan ukur	=	0.0
- Kehilangan energi di pintu sadap	=	0.1
- Kehilangan energi di saluran pembawa (0.10 $h_{100\%}$)	=	0.2
- Jadi elevasi muka air tuntutan di saluran sekunder	=	+ 21.0

Dari perhitungan elevasi muka air di saluran induk Sawitto ruas 3 didapat elevasi muka air pada kondisi 100% + 21.05

[illegible]

5. Menentukan bukaan pintu sadap (a)

a) Data [illegible]

- Lebar pintu sadap (b)	=	[illegible] m
- Tinggi atas pintu sadap (h)	=	0.64 m
- Elevasi [illegible]	= +	[illegible] m

b) Menentukan bukaan pintu (a)

Perhitungan pada kondisi debit 100% (Q [illegible])

Debit [illegible] (Q)	=	[illegible]	m³/d
[illegible]	=	[illegible]	m
Tinggi air di saluran [illegible]	=	[illegible]	m
[illegible]	=	[illegible]	%

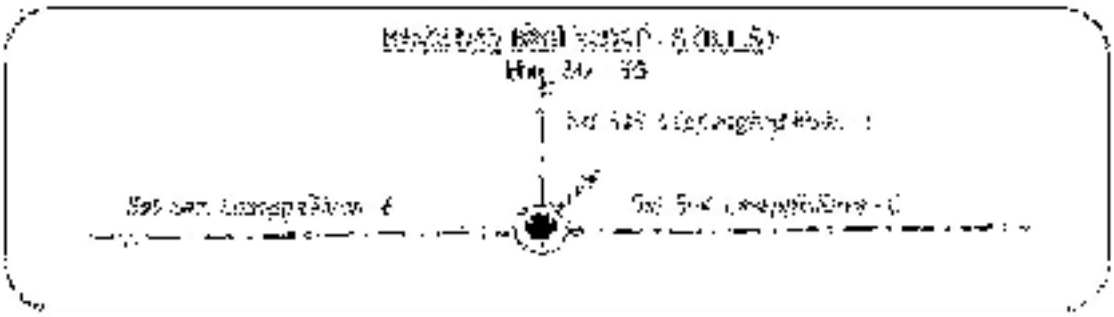
4. [illegible]

[illegible]

[illegible]

[

20. Bangunan Bagi Sadap (Q [illegible])



PERHITUNGAN HIDROLIS BANGUNAN BAGI

LOKASI	:	Bangunan Bagi sadap (Q [illegible])
HPI	:	[illegible]
Saluran	:	Saluran Sekunder Lengkong Kiri [illegible]

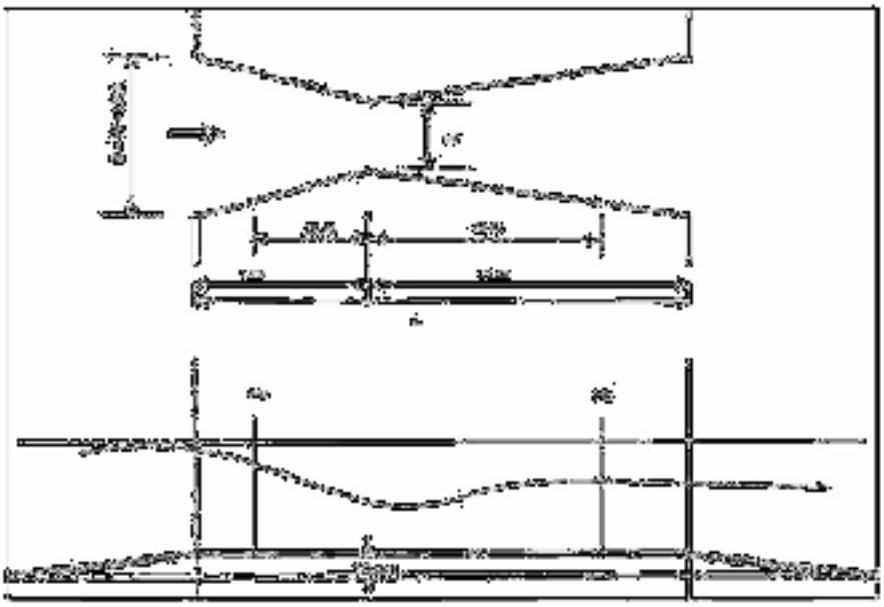
I. DATA DIMENSI SALURAN

A. Dimensi Saluran Sebelum Lengkong

A	=	[illegible] m²
Q	=	[illegible] m³/dt
v	=	0.40 m/dt
R	=	[illegible] m
h	=	0.30 m
I	=	0.0005
m	=	[illegible]
k	=	[illegible]
w	=	0.40 m

B. Dimensi Saluran Sesudah Q

A	=	[illegible] m²
Q	=	[illegible] m³/dt
v	=	[illegible] m/dt
R	=	[illegible] m
h	=	[illegible] m
I	=	[illegible]
m	=	[illegible]
k	=	[illegible]
w	=	[illegible] m



Menghitung tinggi muka air di saluran bangunan tipe [illegible]

a) Data :

Q [illegible] = [illegible] m^3/dt

b = [illegible] m

b) Kehilangan :

Rumus :

B = [illegible]

c) Penyelesaian :

B = 1 + [illegible]

= [illegible] m

= [illegible] m

d) Menentukan kehilangan tinggi tekanan pada [illegible]

[illegible] = [illegible] + [illegible]

= [illegible] + [illegible]

[illegible] = [illegible]

e) Menentukan tinggi muka air di hulu [illegible]

[illegible] = [illegible] + [illegible]

[illegible] = [illegible] + [illegible]

Hu = ([illegible] + [illegible])

Hu = [illegible] m

2. Menghitungkan [illegible] pada [illegible] Lengkung [illegible] - 5

- Kehilangan tinggi tekanan	=	[illegible]
- Kehilangan di [illegible]	=	[illegible]
- Kehilangan energi di [illegible]	=	[illegible]
- Kehilangan energi di [illegible]	=	[illegible]
- Kehilangan energi di [illegible]	=	[illegible]
- Kehilangan tinggi di [illegible]	=	[illegible]
- Kehilangan energi di [illegible]	=	[illegible]
- Jadi tinggi muka air hulu di bangunan pada Lengkung [illegible] - 5	=	[illegible]

Dari perhitungan diatas muka air di hulu pada [illegible] Lengkung [illegible] - 5 diperoleh [illegible] = [illegible]

[illegible] = [illegible] → [illegible]

3. [illegible]

- [illegible]
  - [illegible] = [illegible]
  - [illegible] = [illegible]
  - [illegible] = [illegible]

- [illegible]

  [illegible]

  [illegible] = [illegible]

  [illegible] = [illegible]

  [illegible] = [illegible]

  [illegible] = [illegible]

- [illegible]

  [illegible] = [illegible]

  [illegible] = [illegible]

  [illegible] = [illegible]

  [illegible] = [illegible]

  [illegible] = [illegible]

- [illegible]

  [illegible] = [illegible]

  [illegible] = [illegible]

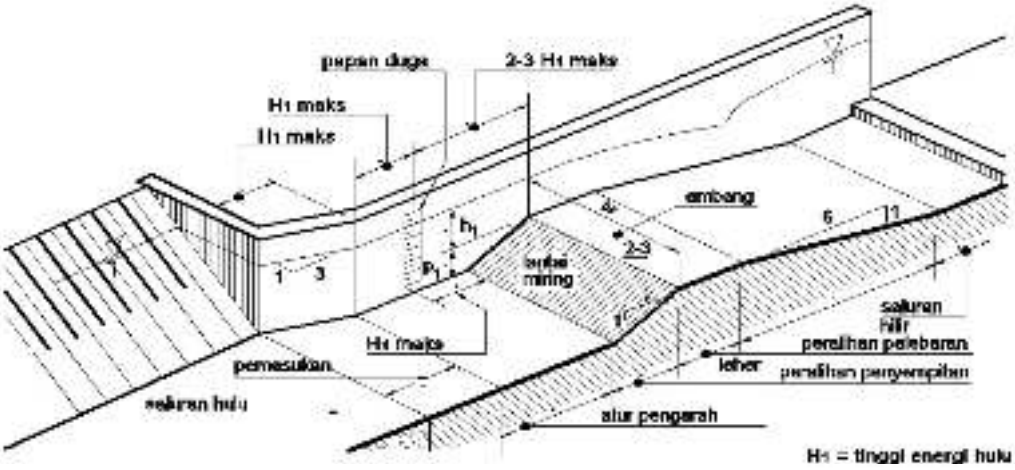
  [illegible] = [illegible]

  [illegible] = [illegible]

  [illegible] =

IV. PERHITUNGAN HIDROLIS BANGUNAN SADAP KEARAH SALURAN TERSIER KIRI - 1

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

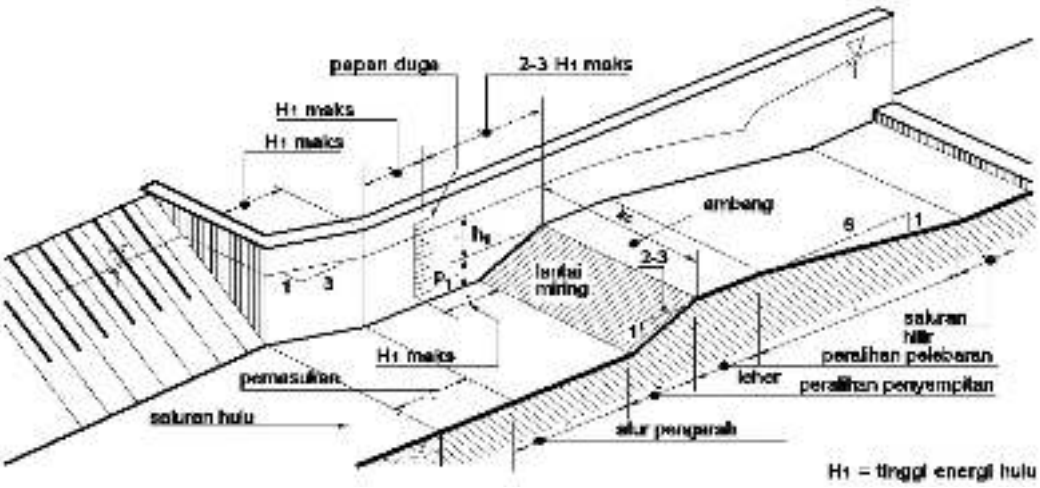
[illegible]

[illegible]

[illegible]

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



[illegible]

[illegible]

[illegible]

4. [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

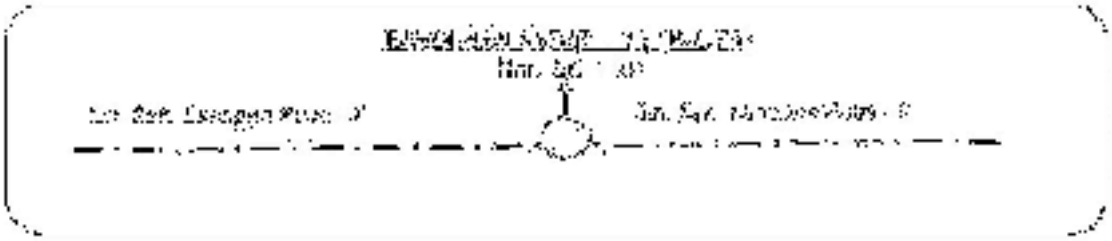
[illegible]

[illegible]

5. Kesimpulan :

- [illegible]

[illegible] (Pengukuran Sketsa [illegible])



PERHITUNGAN HIDROLIS [illegible], [illegible]

[illegible]	:	[illegible]
[illegible]		[illegible]
[illegible]		[illegible]

I. [illegible]

1. [illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible] m
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

II. [illegible]

1. [illegible]

a) [illegible] = + [illegible] m

b) [illegible] = + [illegible] m

2. [illegible]

a) [illegible] = + [illegible] m

b) [illegible] = + [illegible]

c) [illegible] = + [illegible] m

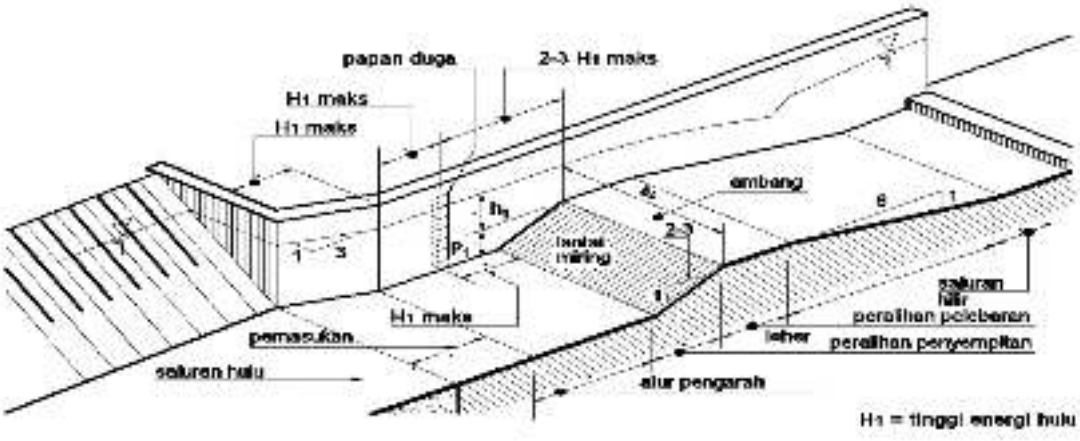
d) [illegible] = [illegible] m

e) [illegible] = + [illegible]

f) [illegible] = + [illegible]

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. [illegible]

a. [illegible]

[illegible]

[illegible]

b. [illegible]

[illegible]

[illegible]

[illegible]

3. [illegible]

[illegible]

[illegible]

[illegible]

4. Menentukan Elevasi muka air tuntutan di saluran sekunder Lasappe ruas - 7

- Elevasi sawah tertinggi	=	12.90
- Genangan air di sawah	=	0.10
- Kehilangan energi dari saluran tersier ke sawah	=	0.05
- Kehilangan energi di sepanjang saluran tersier	=	0.03
- Kehilangan energi di bangunan ukur	=	0.04
- Kehilangan energi di pintu sadap	=	0.10
- Kehilangan energi di saluran pembawa (0.10 $_{\text{ruas-6}}$)	=	0.06
- Jadi elevasi muka air tuntutan di saluran sek. Lasappe ruas - 7	=	+ 13.29

Dari perhitungan elevasi muka air di saluran sekunder Lasappe ruas - 7

didapat elevasi muka air pada kondisi 100% 13.03

EMA 100% > EMA tuntutan OK !

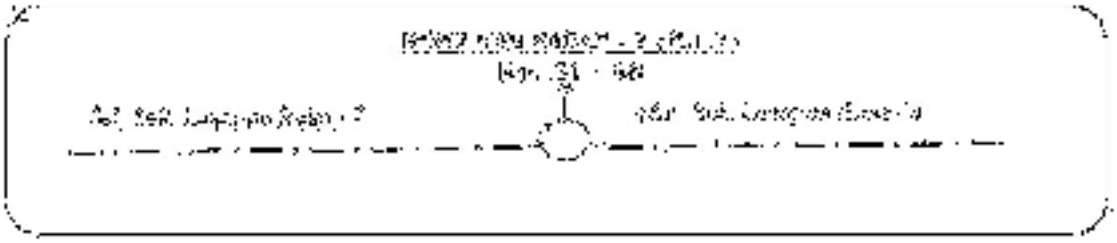
5. Menetukan bukaan pintu sorong (a)

[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]	:	[illegible]
[illegible]	:	[illegible]
[illegible]	:	[illegible]

I. [illegible]

1. [illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

II. [illegible]

1. [illegible]

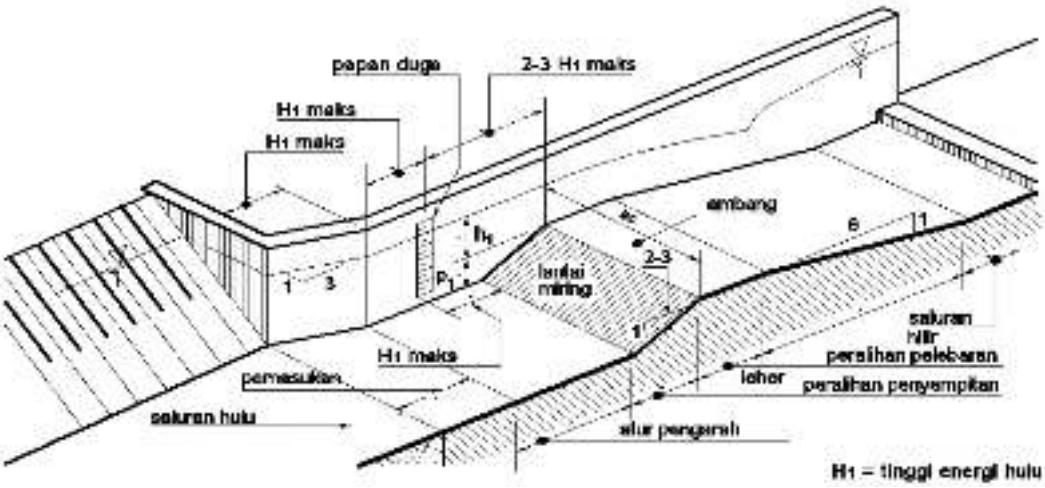
[illegible]	=	[illegible]	[illegible]
[illegible]	=	[illegible]	[illegible]

2. [illegible]

[illegible]	=	[illegible]	[illegible]
[illegible]	=	[illegible]	
[illegible]	=	[illegible]	[illegible]
[illegible]	=	[illegible]	[illegible]
[illegible]	=	[illegible]	
[illegible]	=	[illegible]	

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

4. Menentukan Elevasi muka air tuntutan di saluran sekunder Lasappe ruas - 7

- Elevasi sawah tertinggi	=	12.90
- Genangan air di sawah	=	0.10
- Kehilangan energi dari saluran tersier ke sawah	=	0.05
- Kehilangan energi di sepanjang saluran tersier	=	0.03
- Kehilangan energi di bangunan ukur	=	0.04
- Kehilangan energi di pintu sadap	=	0.10
- Kehilangan energi di saluran pembawa (0.10 $_{(100\%)}$)	=	0.08
- Jadi elevasi muka air tuntutan di saluran sek. Lasappe ruas - 7	=	+ 13.28

Dari perhitungan elevasi muka air di saluran sekunder Lasappe ruas - 7 didapat elevasi muka air pada kondisi 100% 13.49

EMA 100% > EMA tuntutan OK !

5. Menetukan bukaan pintu sorong (a)

- Ukuran Pintu :
  - [illegible]
  - Tinggi [illegible] pintu [illegible] [illegible]
  - [illegible]

- [illegible]
  [illegible]
  [illegible] = [illegible]
  [illegible] = [illegible]
  [illegible] = [illegible]
  [illegible] = [illegible]

- [illegible]
  [illegible]
  [illegible]

  [illegible]

  [illegible]

  [illegible]

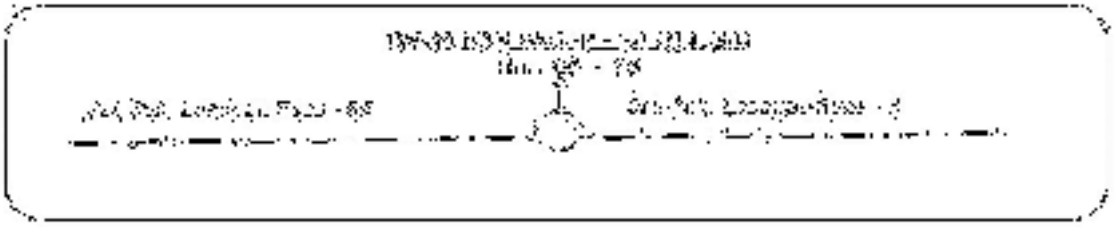
  [illegible]

  [illegible]

  [illegible]

- [illegible]
  - [illegible] = [illegible]

2. [illegible]



[illegible]

[illegible]	:	[illegible]
[illegible]	:	[illegible]
[illegible]	:	[illegible]

1. [illegible]

1. Dimensi Saluran/Tersier

A	=	[illegible] ha
Q	=	0.032 m^3/dt
v	=	0.26 m/dt
b	=	0.55 m
h	=	0.18 m
i	=	0.0003
m	=	1.00
k	=	60
w	=	0.30 m

2. Dimensi Saluran Sek.Lasappe ruas - 8A

A	=	3,175 ha
Q	=	5.588 m^3/dt
v	=	#REF! m/dt
b	=	3.50 m
h	=	1.36 m
i	=	0.0004
m	=	0.00
k	=	70
w	=	0.75 m

3. Dimensi Saluran Sek.Lasappe ruas - 8

A	=	0.30 ha
Q	=	0.000 m^3/dt
v	=	#REF! m/dt
b	=	1.50 m
h	=	0.74 m
i	=	0.0004
m	=	1.00
k	=	35
w	=	40.00 m

II. DATA TEKNIS UNSUR DAN BANGUNAN

1. [illegible]

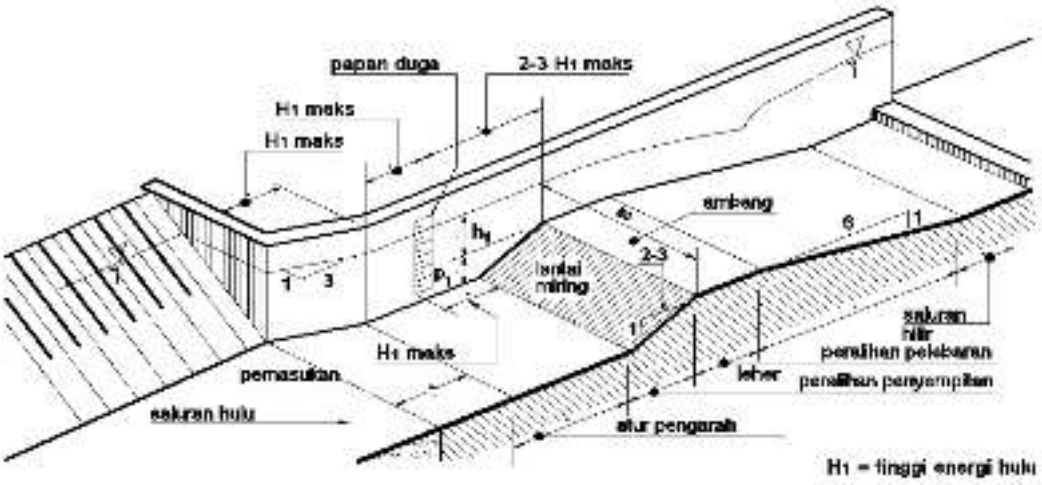
a. [illegible]	=	[illegible]	m
b. [illegible]	=	[illegible]	m

2. Data teknis sadap dari bangunan sekunder ke saluran

a. [illegible]	=	[illegible]	[illegible]
b. [illegible]	=	[illegible]	
c. [illegible]	=	[illegible]	m
d. [illegible]	=	0,60	m
e. [illegible]	=	[illegible]	
f. [illegible]	=	[illegible]	

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. [illegible]

a) [illegible]

[illegible]

b) [illegible]

[illegible]

[illegible] x [illegible]

[illegible]

$$h = \left[\frac{Q}{[illegible] \times b} \right]^{2/3}$$

$$= \left[\frac{0.032}{1.71 \times 0.30} \right]^{2/3}$$

$$= 0.16 \text{ m}$$

3. **Menentukan kehilangan energi di bangunan ukur ambang lebar (z)**

z = 1/2 h (min. 0,05 m)

= 0.50 x 0.16

= 0.08 m

4. **Menentukan Elevasi muka air tuntutan di saluran sekunder Lasappe ruas - 8A**

- Elevasi sawah tertinggi	=	12.40
Genangan air di sawah	=	0.10
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- Elevasi muka air tertinggi di saluran sekunder Lasappe ruas - 8A	=	[illegible]

[illegible] Lasappe ruas - 8A

[illegible] = [illegible]

[illegible] = [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

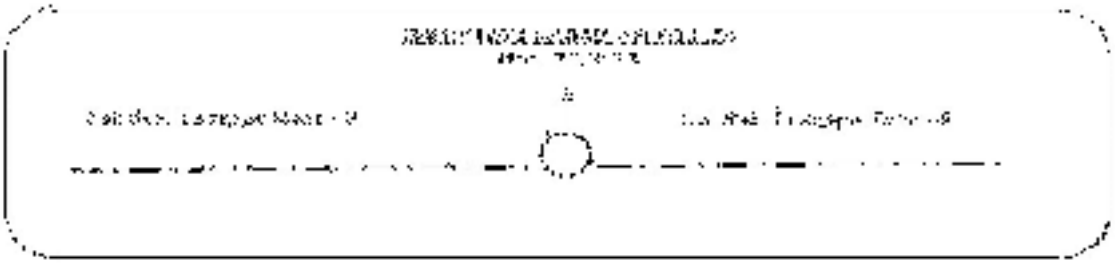
[illegible]

[illegible]

[illegible]

[illegible]

[illegible] Bangunan Mercu (D.L.4)



[illegible]

[illegible]	:	[illegible]
[illegible]	:	[illegible]
[illegible]	:	[illegible]

I. [illegible]

A. [illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

B. [illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

C. [illegible]

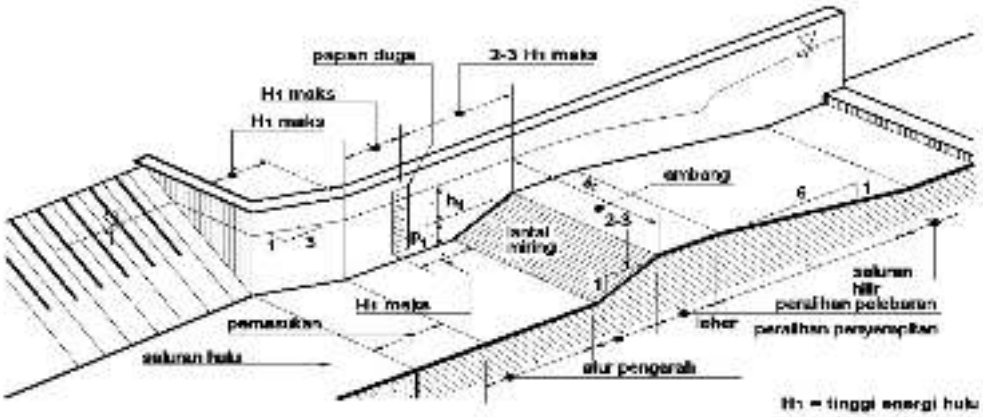
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

[illegible]

[illegible]

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. Menentukan tinggi muka air di atas ambang lebar (h)

➪ Data :

$Q_{tersier}$ = 0.076 m^3/dt

b_{ambang} = 0.50 m

➪ Perhitungan :

Rumus :

$Q = 1{,}71 \times b \times h^{3/2}$

Penyelesaian :

$$h = \left[\frac{Q}{1.71 \times b}\right]^{2/3}$$

$$= \left[\frac{0.079}{1.71 \times 0.50}\right]^{2/3}$$

= 0.20 m

3. Menentukan kehilangan energi di bangunan ukur ambang lebar (z)

z = 1/2 h (min. 0.05 m)

= 0.50 x 0.20

= 0.10 m

4. Menentukan Elevasi muka air tuntutan di saluran sekunder Lasappe ruas - 8

- Elevasi sawah tertinggi	=	12.32
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible] Lasappe ruas - 8	=	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

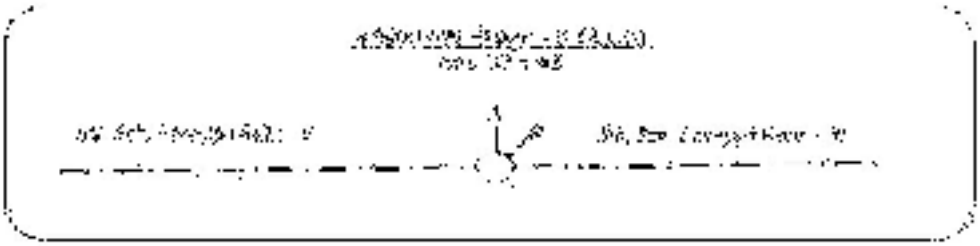
[illegible]

[illegible]

[illegible]

[illegible]

26. Perhitungan Saluran # (D.L.9)



[illegible]

[illegible]	:	[illegible]
[illegible]	:	[illegible]
[illegible]	:	[illegible]

I. DATA DIMENSI SALURAN

1. Dimensi Saluran Tersier T.9 kl.1

A	=	96.86 ha
Q	=	0.096 m³/dt
v	=	0.34 m/dt
b	=	0.70 m
h	=	0.41 m
i	=	0.0003
m	=	0.00
k	=	35
w	=	0.30 m

2. Dimensi Saluran Tersier T.9 kl.2

A	=	74.28 ha
Q	=	0.076 m³/dt
v	=	0.22 m/dt
b	=	0.50 m
h	=	0.39 m
i	=	0.0003
m	=	1.00
k	=	35
w	=	0.30 m

3. Dimensi Saluran Sek.Lasappe ruas - 9

A	=	328 ha
Q	=	[illegible]
v	=	[illegible]
b	=	[illegible]
h	=	[illegible]
i	=	[illegible]
m	=	[illegible]
k	=	[illegible]
w	=	[illegible]

4. Dimensi Saluran Sek.Lasappe ruas - 10

A	=	254.00 ha
Q	=	[illegible]
v	=	[illegible]
b	=	[illegible]
h	=	[illegible]
i	=	[illegible]
m	=	[illegible]
k	=	[illegible]
w	=	[illegible]

[illegible]

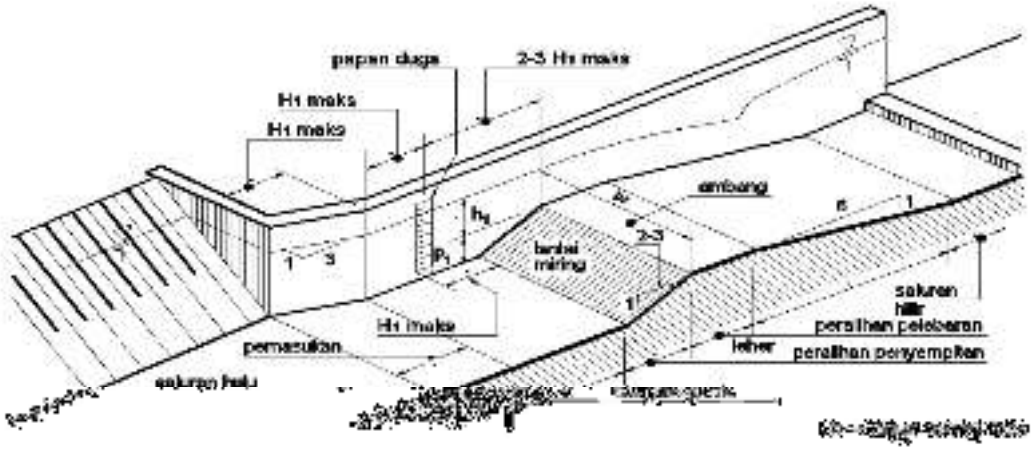
1. [illegible]

   1. [illegible]
      a. [illegible] = [illegible] m
      b. [illegible] = [illegible] m

   2. [illegible]
      a. [illegible] = [illegible] m
      b. [illegible] = [illegible]
      c. [illegible] = [illegible] m
      d. [illegible] = [illegible] m
      e. [illegible] = [illegible]
      f. [illegible] = [illegible]

III. PERHITUNGAN HIDROLIS BANGUNAN SADAP

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



[illegible]

[illegible]

[illegible]

$$= \left[\frac{0.098}{1.71 \times 0.50} \right]^{2/3}$$

$$= 0.24 \text{ m}$$

3. **Menentukan kehilangan energi di bangunan ukur ambang lebar (z)**

z = 1/2 h (min. 0,05 m)

= 0.50 x 0.24

= 0.12 m

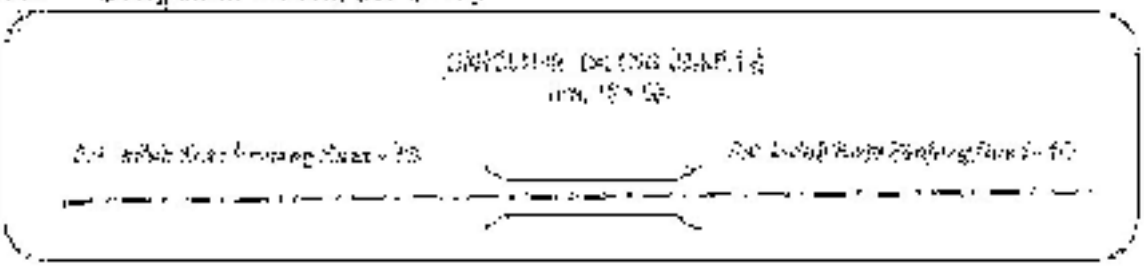
4. **Menentukan Elevasi muka air tuntutan di saluran sekunder Lasappe ruas - 9**

- Elevasi sawah tertinggi	=	12.32
- Genangan air di sawah	=	0.10
- Kehilangan energi [illegible]	=	[illegible]
- Kehilangan energi [illegible]	=	[illegible]
- Kehilangan energi [illegible]	=	[illegible]
- Kehilangan energi [illegible]	=	[illegible]
- Kehilangan energi [illegible]	=	[illegible]
[illegible]	=	[illegible]

[illegible]

[illegible]

27. [illegible]



PERHITUNGAN HIDROLIS PANCURUSAN TALUS

[illegible]		[illegible]
[illegible]	:	[illegible]
SALURAN	:	[illegible]

I. DATA PENGENDALIAN

A. [illegible]

A	=	[illegible] m2
Q	=	[illegible] m³/d
v	=	1.17 m/d
h	=	3.80 m
i	=	1.33 m
	=	[illegible]
n	=	0.00
k	=	70
μ	=	[illegible] m

B. [illegible]

A	=	[illegible] m2
Q	=	[illegible] m³/d
v	=	[illegible]
h	=	[illegible] m
i	=	[illegible] m
	=	[illegible]
n	=	[illegible]
k	=	[illegible]
μ	=	[illegible] m

ii [illegible]

[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]
[illegible]		=	[illegible]	[illegible]

iii [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]										[illegible]

[illegible]

[illegible]

APPENDIX 14

SOUTH SULAWESI DATA

[illegible]

[illegible]

[illegible]

[illegible]	:	[illegible]
[illegible]		[illegible]
[illegible]		[illegible]

[illegible]

1. [illegible]

A	=	[illegible]
Q	=	0.860 m^3/dt
v	=	0.48 m/dt
b	=	2.40 m
h	=	0.74 m
i	=	0.00016
m	=	1.00
k	=	60
w	=	0.50 m

2. **Dimensi SaluranTersier M 1.Ki 1**

A	=	48.00 ha
Q	=	0.067 m^3/dt
v	=	0.21 m/dt
b	=	0.50 m
h	=	0.37 m
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

3. [illegible]

A	=	[illegible]
Q	=	[illegible] m^3/dt
v	=	[illegible] m/dt
b	=	[illegible] m
h	=	[illegible] m
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

[illegible]

[illegible]

1. Data teknis saluran dan bangunan di saluran sekunder Macero Ruas -2

➪ Elev. dasar Sal. Sek. Macero Ruas -2 (di bangunan sadap)	=	+	10.76	m
➪ Elevasi Muka Air 100% di sal. Sek. Macero Ruas -2	=	+	11.50	m

2. **Data teknis saluran dan bangunan saluran tersier arah kiri (M.1 Ki 1)**

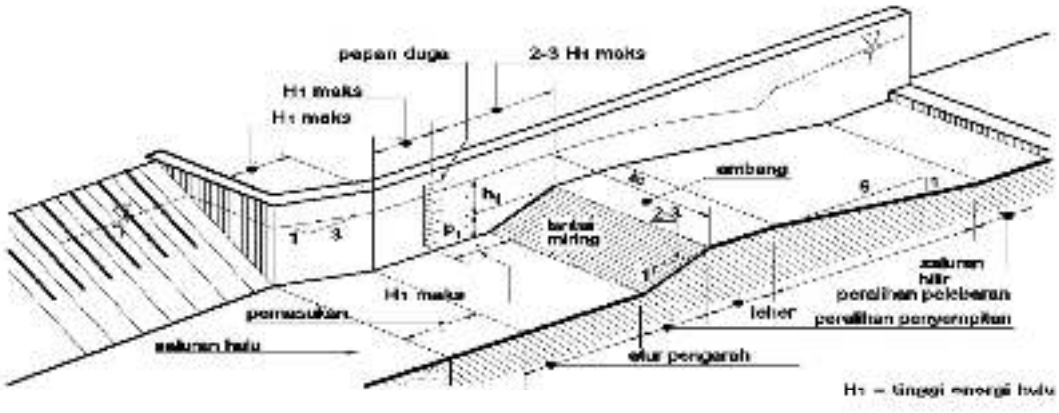
➪ Elevasi dasar pintu sadap tersier	=	+	11.21	m
➪ Elev. dasar Saluran tersier di hilir pintu sadap	=	+	10.41	
➪ Elevasi Muka Air di hilir pintu sadap	=	+	10.80	m
➪ Lebar pintu sadap tersier (B)	=		0.50	m
➪ elevasi dasar saluran di hilir bangunan ukur	=	+	10.31	
➪ elevasi muka air di hilir bangunan ukur	=	+	10.68	

3. **Data teknis saluran dan bangunan saluran tersier arah kiri (M.1 Ki 2)**

➪ Elevasi dasar pintu sadap tersier	=	+	11.21	m
➪ Elev. dasar Saluran tersier di hilir pintu sadap	=	+	10.86	
➪ Elevasi Muka Air di hilir pintu sadap	=	+	11.23	m
➪ Lebar pintu sadap tersier (B)	=		0.50	m
➪ elevasi dasar saluran di hilir bangunan ukur	=	+	10.86	
➪ elevasi muka air di hilir bangunan ukur	=	+	11.23	

II. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.M.1 (TERSIER M.1 Ki 1)

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. Menentukan tinggi muka air di atas ambang lebar (h)

⇨ Data :

$Q_{tersier}$ = 0.067 m^3/dt

b_{ambang} = 0.30 m

⇨ Perhitungan

Rumus :

$Q = 1{,}71 \times b \times h^{3/2}$

Penyelesaian

$$h = \left[\frac{Q}{1{,}71 \times b}\right]^{2/3}$$

$$= \left[\frac{0.067}{1.71 \times 0.30}\right]^{2/3}$$

$$= 0.26 \text{ m}$$

3. Menentukan kehilangan energi di bangunan ukur ambang lebar (z)

z = 1/2 h (min 0,05 m)

= 0.50 x 0.26

= 0.13 m

4. Menentukan Elevasi muka air tuntutan di saluran sekunder

- Elevasi sawah tertinggi	=	10.25
- Genangan air di sawah	=	0.10
- Kehilangan energi dari saluran tersier ke sawah	=	0.05
- Kehilangan energi di sepanjang saluran tersier	=	0.0003
- Kehilangan energi di bangunan ukur	=	0.13
- Kehilangan energi di pintu sadap	=	0.10
- Kehilangan energi di saluran pembawa (0.10 x [illegible])	=	0.304
Jadi elevasi muka air tuntutan di saluran sek. Macero Ruas 2	=	+ 10.64

Dari perhitungan elevasi muka air di saluran sek. Macero Ruas 2

didapat elevasi muka air pada kondisi 100% + 11.50

[illegible] + [illegible] [illegible]

5. [illegible]

a) [illegible]

- [illegible] = [illegible]
- [illegible] = [illegible]
- [illegible] = [illegible]

b) [illegible]

[illegible]

[illegible] = [illegible]

[illegible] = [illegible] m

[illegible] = [illegible] m

[illegible] = [illegible] m

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

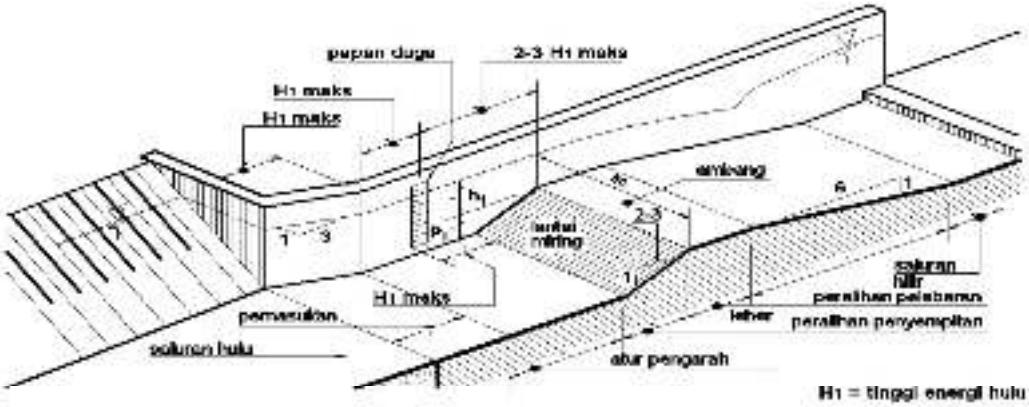
[illegible]

[illegible]

[illegible]

V. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.M.1 (TERSIER M.1 Ki 2)

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. Menentukan tinggi muka air di atas ambang lebar (h)

➪ Data :

$Q_{tersier}$ = 0.070 m^3/dt

b_{ambang} = 0.30 m

➪ Perhitungan :

Rumus :

$Q = 1{,}71 \times b \times h^{3/2}$

Penyelesaian :

$$h = \left[\frac{Q}{1{,}71 \times b}\right]^{2/3}$$

$$= \left[\frac{0.070}{1.71 \times 0.30}\right]^{2/3}$$

$$= 0.27 \text{ m}$$

3. Menentukan kehilangan energi di bangunan ukur ambang lebar (z)

z = 1/2 h (min. 0.05 m)

= 0.50 x 0.27

= 0.13 m

4. **Menentukan Elevasi muka air tuntutan di saluran sekunder**

- Elevasi sawah tertinggi	=	10.81
- Genangan air di sawah	=	0.10
- Kehilangan energi dari saluran tersier ke sawah	=	0.05
- Kehilangan energi di sepanjang saluran tersier	=	0.0006
- Kehilangan energi di bangunan ukur	=	0.13
- Kehilangan energi di pintu sadap	=	0.10
- Kehilangan energi di saluran pembawa (0.10 $_{h100\%}$)	=	0.01
- Jadi elevasi muka air tuntutan di saluran sek. Macero Ruas-2	=	+ 11.20

Dari perhitungan elevasi muka air di saluran sek. Macero Ruas-2 didapat elevasi muka air pada kondisi 100% + 11.50

[illegible] = [illegible] (OK)

5. [illegible]

a. [illegible]

- [illegible] = [illegible]
- [illegible] = [illegible]
- [illegible] = [illegible]

b. [illegible]

[illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible] m
[illegible]	=	[illegible] m
[illegible]	=	[illegible] m

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

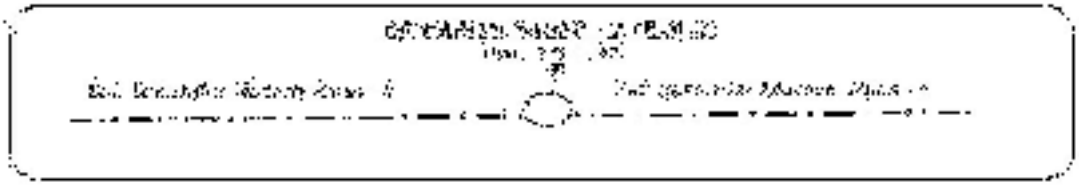
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]	:	[illegible]
[illegible]	:	[illegible]
[illegible]	:	[illegible]

[illegible]

1. [illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

2. [illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

3. [illegible]

[illegible]		[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

DATA TEKNIS SALURAN DAN BANGUNAN

1. Data teknis saluran dan bangunan di saluran Sekunder Macero Ruas -3

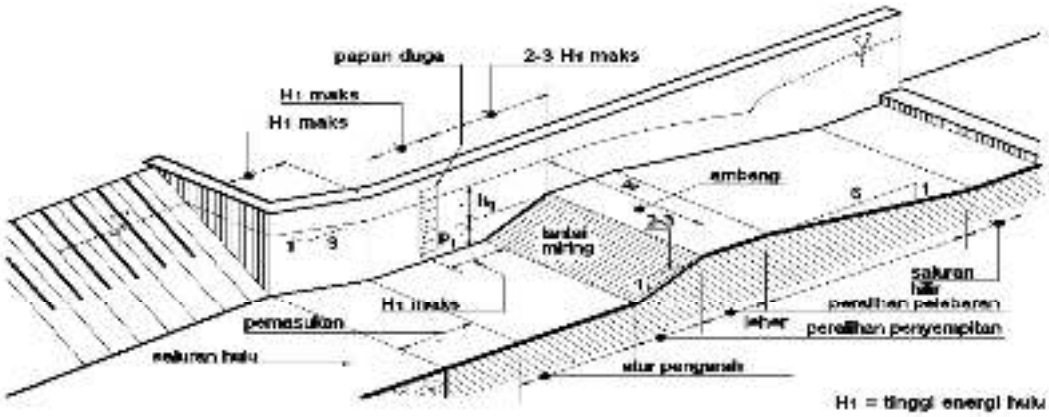
- Elev. dasar Sal. Sek. Macero Ruas -3 (di bangunan sadap) = + 10.69 m
- Elevasi Muka Air 100% di sal. Sek. Macero Ruas -3 = + 11.37 m

2. Data teknis saluran dan bangunan saluran tersier arah kiri (B.M.2 Ki)

- Elevasi dasar pintu sadap tersier = + 10.98 m
- Elev. dasar Saluran tersier di hilir pintu sadap = + 10.23
- Elevasi Muka Air di hilir pintu sadap = + 10.70 m
- Lebar pintu sadap tersier (B) = 0.60 m
- elevasi dasar saluran di hilir bangunan ukur = + 9.93
- elevasi muka air di hilir bangunan ukur = + 10.25

II. PERHITUNGAN HIDROLIS BANGUNAN SADAP BM.2 (Tersier M.2 Ki)

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



[illegible]

[illegible]

$$= \left[\frac{0.070}{1.71 \times 0.30} \right]^{2/3}$$

$$= 0.27 \text{ m}$$

3. **Menentukan kehilangan energi di bangunan ukur ambang lebar (z)**

$$z = 1/2\ h \ (\text{min. } 0.05 \text{ m})$$

$$= 0.50 \times 0.27$$

$$= 0.13 \text{ m}$$

4. **Menentukan Elevasi muka air tuntutan di saluran sekunder**

- Elevasi sawah tertinggi	=	9.88
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
[illegible]	=	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

1. [illegible]

A		[illegible]	ha
Q	=	0.645	m^3/dt
v	=	1.20	m/dt
b	=	0.52	m
h	=	2.03	m
i	=	0.0005	
m	=	1.00	
k	=	60	
w	=	0.60	m

2. **Dimensi SaluranTersier B.M 3.KI 1**

A	=	58.00	ha
Q	=	0.091	m^3/dt
v	=	0.31	m/dt
b	=	1.10	m
h	=	0.24	m
i	=	0.0003	
m	=	[illegible]	
k	=	[illegible]	
w	=	[illegible]	m

3. [illegible]

A	=	[illegible]	ha
Q	=	[illegible]	m^3/dt
v	=	[illegible]	m/dt
b	=	[illegible]	m
h	=	[illegible]	m
i	=	[illegible]	
m	=	[illegible]	
k	=	[illegible]	
w	=	[illegible]	m

. DATA TEKNIS SALURAN DAN BANGUNAN

1. Data teknis saluran dan bangunan di saluran Sekender Macero Ruas -4

- Elev. dasar Sal. Sek. Macem Ruas -4 (di bangunan sadap) = + 9.61 m
- Elevasi Muka Air 100% di sal. Sek. Macero Ruas -4 = + 10.81 m

2. Data teknis saluran dan bangunan saluran tersier arah kiri (B.M.3 Ki 1)

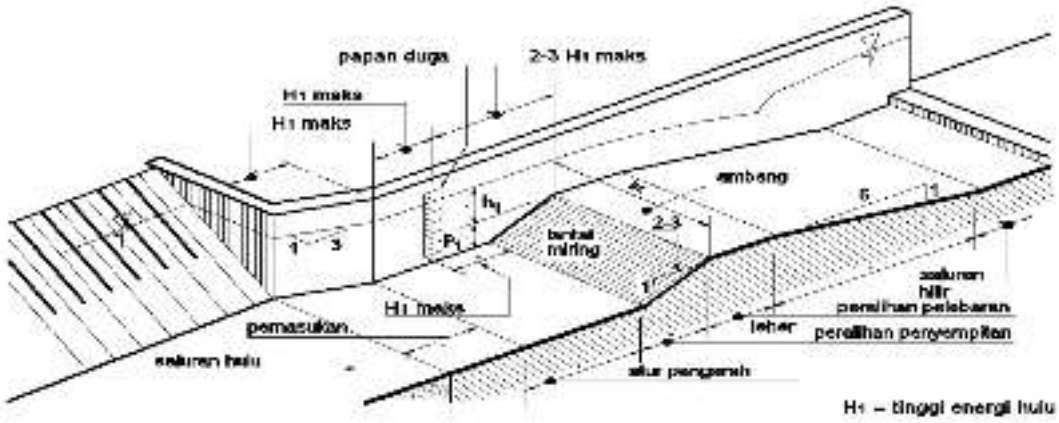
- Elevasi dasar pintu sadap tersier = + 10.31 m
- Elev. dasar Saluran tersier di hilir pintu sadap = + 10.11
- Elevasi Muka Air di hilir pintu sadap = + 10.50 m
- Lebar pintu sadap tersier (B) = 1.10 m
- elevasi dasar saluran di hilir bangunan ukur = + 10.11
- elevasi muka air di hilir bangunan ukur = + 10.35

3. Data teknis saluran dan bangunan saluran tersier arah kiri (B.M.3 Ki 2)

- Elevasi dasar pintu sadap tersier = + 10.51 m
- Elev. dasar Saluran tersier di hilir pintu sadap = + 10.31
- Elevasi Muka Air di hilir pintu sadap = + 10.77 m
- Lebar pintu sadap tersier (B) = 0.50 m
- elevasi dasar saluran di hilir bangunan ukur = + 10.31
- elevasi muka air di hilir bangunan ukur = + 10.75

II. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.M.3 (TERSIER M.3 Ki 1)

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. [illegible]

[illegible]

[illegible]

[illegible]

$$b = \left[\frac{Q}{1.71 \times h^{1.5}}\right]^{2/3}$$

$$= \left[\frac{0.081}{1.71 \times 0.60}\right]^{2/3}$$

$$= 0.18 \text{ m}$$

3. **Menentukan kehilangan energi di bangunan ukur ambang lebar (z)**

z = 1/2 h (min. 0,05 m)

= 0.50 x 0.16

= 0.08 m

4. **Menentukan Elevasi muka air tuntutan di saluran sekunder**

- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
[illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
- [illegible]	=	[illegible]
[illegible]	=	0.02
- [illegible]	=	+ [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

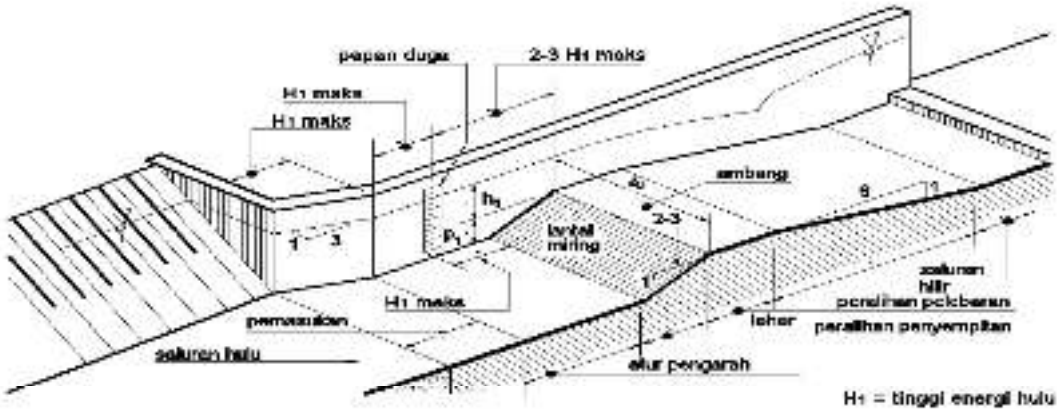
[illegible]

[illegible]

[illegible]

V. PERHITUNGAN HIDROLIS BANGUNAN SADAP B.M.1 (TERSIER M.1 Ki 2)

1. Perhitungan hidrolis bangunan ukur ambang lebar di hilir pintu sadap



2. Menentukan tinggi muka air di atas ambang lebar (h)

⇨ Data :

$Q_{tersier}$ = 0.067 m^3/dt

b_{ambang} = 0.30 m

⇨ Perhitungan :

Rumus :

$Q = 1{,}71 \times b \times h^{3/2}$

Penyelesaian :

$$h = \left[\frac{Q}{1{,}71 \times b}\right]^{2/3}$$

$$= \left[\frac{0.067}{1.71 \times 0.30}\right]^{2/3}$$

$$= 0.26 \text{ m}$$

3. Menentukan kehilangan energi di bangunan ukur ambang lebar (z)

z = 1/2 h (min. 0,05 m)

= 0.50 x 0.26

= 0.13 m

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

1. [illegible]

a. [illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

b. [illegible]

[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]
[illegible]	=	[illegible]

[illegible]

[illegible]			=	[illegible]	[illegible]
[illegible]			=	[illegible]	[illegible]
[illegible]			=	[illegible]	[illegible]
[illegible]			=	[illegible]	[illegible]
[illegible]			=	[illegible]	[illegible]
[illegible]			=	[illegible]	[illegible]
[illegible]			=	[illegible]	[illegible]
[illegible]			=	[illegible]	[illegible]
[illegible]			=	[illegible]	[illegible]
[illegible]			=	[illegible]	[illegible]
[illegible]			=	[illegible]	[illegible]
[illegible]			=	[illegible]	[illegible]
[illegible]		[illegible]	=	[illegible]	[illegible]
		[illegible]	=	[illegible]	[illegible]
		[illegible]	=	[illegible]	[illegible]
[illegible]		[illegible]	=	[illegible]	
		[illegible]	=	[illegible]	
[illegible]			=	[illegible]	[illegible]
[illegible]			=	[illegible]	[illegible]
[illegible]				[illegible]	[illegible]
[illegible]		[illegible]	=	[illegible]	

. [illegible]

a. [illegible]

[illegible] 2.00 [illegible]

b. [illegible]

- [illegible] = [illegible]
- [illegible] = [illegible]

$$[illegible] = \frac{[illegible]}{[illegible]} \quad [illegible]$$

$$= \frac{[illegible] - 2.00}{3} \quad [illegible]$$

$$= [illegible]$$

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]									[illegible]

[illegible]

[illegible]

[illegible]