

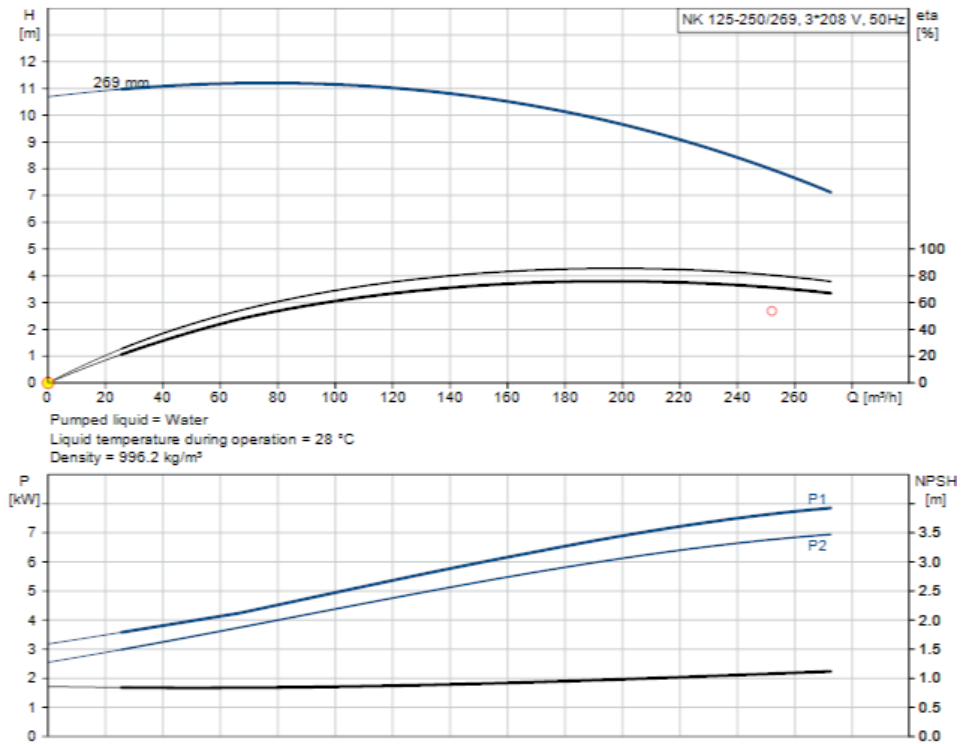
LAMPIRAN A

SPEKIFIKASI AKSESORIS DAN PELENGKAP

Size	J.Min. (mm)	J.Max. (mm)	T.Min. (mm)	Weight (kg)	Per Bundle Qty	Per Bundle Weight
1 1/2 "	46.0	50.0	3.0	13	80	1040
2 "	57.0	62.0	3.0	16	62	992
3 "	83.0	87.5	3.3	23	58	1334
4 "	109.0	114.0	3.8	34	34	1156
5 "	133.0	137.0	3.8	43	26	1118
6 "	158.0	162.0	3.8	51	17	867
8 "	210.0	216.0	4.3	81	10	810
10 "	266.0	271.0	5.6	127	8	1016
12 "	314.0	321.0	5.6	140	6	840
15 "	398.0	406.0	7.6	240	3	720

Gambar A. 1 Katalog Pipa Cast Iron

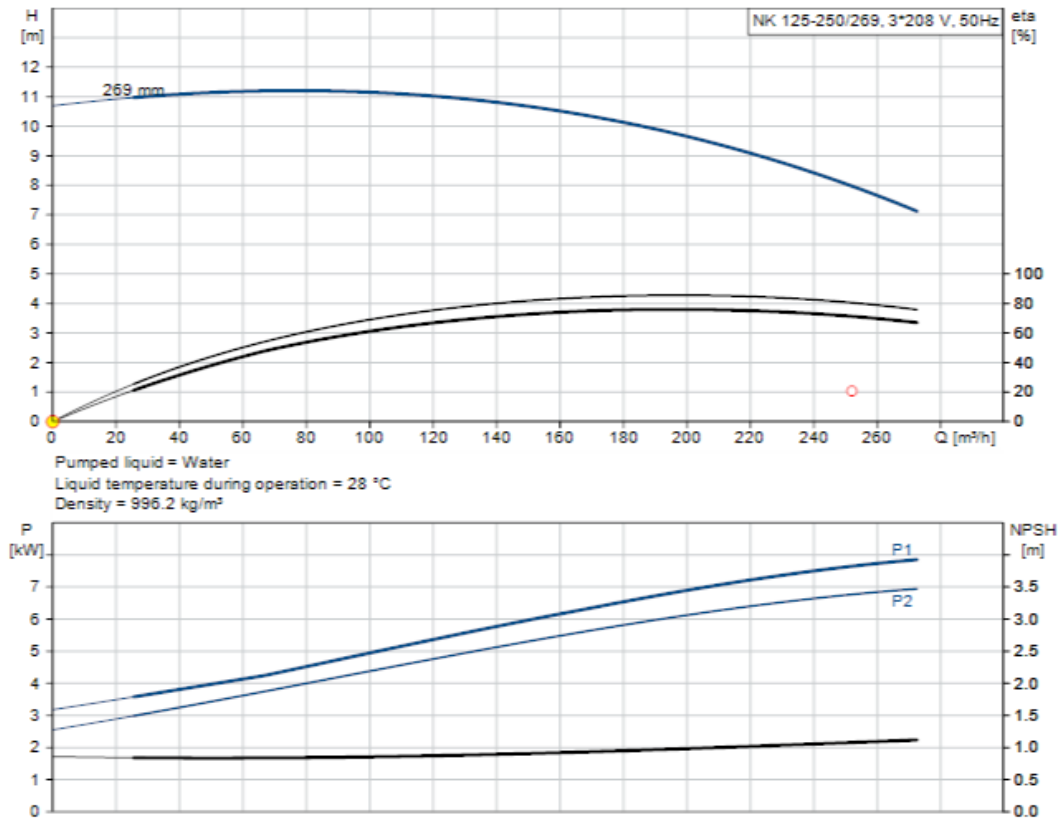
Sumber: Tigerpipe.com



Gambar A. 2 Grafik Pompa Centrifugal Intake ke Aerasi

Grundfos NK 125-250/269 AA1F2AESBAQEMW5

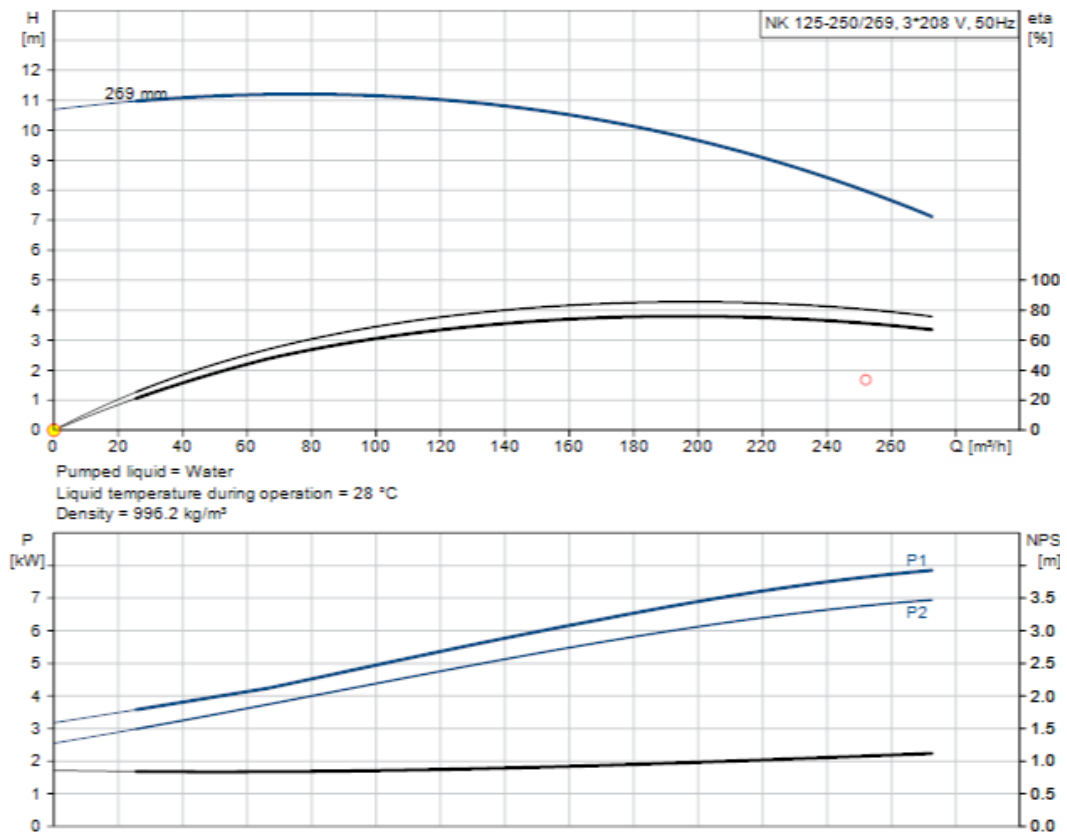
Sumber: <https://product-selection.grundfos.com/id/products/nk-nke-nke-series-2000-nk-bare-shaft/nk/nk-125-250269-98317172?pumpsystemid=1717339098&tab=variant-sizing-results>



Gambar A. 3 Grafik Pompa Centrifugal Aerasi ke Koagulasi

Grundfos NK 125-250/269 AA1F2AESBAQEMW5

Sumber: <https://product-selection.grundfos.com/id/products/nk-nke-nke-series-2000-nk-bare-shaft/nk/nk-125-250269-98317172?pumpsystemid=1717339098&tab=variant-sizing-results>

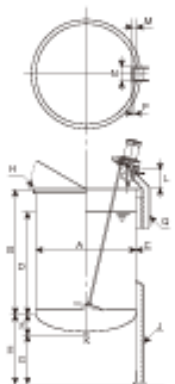


Gambar A. 4 Grafik Pompa Centrifugal Filtrasi ke Reservoir

Grundfos NK 125-250/269 AA1F2AESBAQEMW5

<https://product-selection.grundfos.com/id/products/nk-nke-nke-series-2000-nk-bare-shaft/nk/nk-125-250269-98317172?pumpsystemid=1717339098&tab=variant-sizing-results>

Specification of optional tanks



Model	Available capacity	Minimum capacity	Tank dimension (mm)													Weight (kg)	
			r	d	A	B	C	D	E	F	G	H(Std)	I(Std)	J(Std)	K	Tank	Std*
ZTF-180	180	130	360	300	3	60	60	130	200	120x120x3	3.4.30x120x3	1/2 B Standard	43	3			
ZTF-180	180	160	360	300	3	60	60	140	200	120x120x3	3.4.30x120x3	1/2 B Standard	45	4			
ZTF-280	280	260	660	700	3	120	60	180	280	120x120x3	3.4.30x120x3	1/2 B Standard	63	3.5			
ZTF-380	380	361	750	800	3	120	60	170	320	120x120x3	4.4.30x120x3	1/2 B Standard	77	6.5			
ZTF-480	480	479	860	900	3	120	60	180	360	120x120x3	4.4.30x120x3	1/2 B Standard	98	8			
ZTF-580	580	580	960	1000	3	120	60	200	380	120x120x3	4.4.30x120x3	1/2 B Standard	108	9			
ZTF-680	680	660	1060	1100	3	120	60	210	420	120x120x3	4.4.30x120x3	1 B Standard	138	12			
ZTF-1080	1080	1077	1900	2100	3	120	60	260	580	120x120x3	4.4.30x120x3	1 B Standard	178	18			
ZTF-1480	1480	1475	2500	2700	4	120	60	290	620	120x120x3	4.4.30x120x3	1 B Standard	268	24			
ZTF-2080	2080	2075	3300	3500	4	120	60	320	780	120x120x3	4.4.30x120x3	1 B Standard	328	26			
ZTF-2680A	2680	2675	4100	4300	4	120	60	310	820	120x120x3	4.4.30x120x3	1 B Standard	328	28			
ZTF-2680	2680	2675	4100	4300	4	120	60	320	820	120x120x3	4.4.30x120x3	1 B Standard	328	28			
ZTF-3280	3280	3260	4900	5100	4	120	60	320	920	120x120x3	4.4.30x120x3	1 B Standard	418	30			
ZTF-3880A	3880	3875	5700	5900	4	120	60	320	1020	120x120x3	4.4.30x120x3	1 B Standard	498	32			
ZTF-3880	3880	3875	5700	5900	4	120	60	330	1020	120x120x3	4.4.30x120x3	1 B Standard	498	32			
ZTF-4480	4480	4460	6500	6700	4	120	60	320	1120	120x120x3	4.4.30x120x3	1 1/2 B Standard	578	34			
ZTF-5080A	5080	5060	7300	7500	4	120	60	320	1220	120x120x3	4.4.30x120x3	1 1/2 B Standard	658	36			
ZTF-5080	5080	5060	7300	7500	4	120	60	330	1220	120x120x3	4.4.30x120x3	1 1/2 B Standard	658	36			
ZTF-6080	6080	6060	8100	8300	4	120	60	320	1320	120x120x3	4.4.30x120x3	1 1/2 B Standard	738	38			
ZTF-6680	6680	6660	8900	9100	4	120	60	320	1420	120x120x3	4.4.30x120x3	1 1/2 B Standard	818	40			

* The Std type is standard.
 * The Std type is also available.

Gambar A. 5 Tabel Spesifikasi Tangki Pembubuh Koagulasi, Tangki Koagulasi, dan Tangki Desinfeksi

Sumber: https://www.satake.co.jp/en/product/catalog/data/02_aseries.pdf

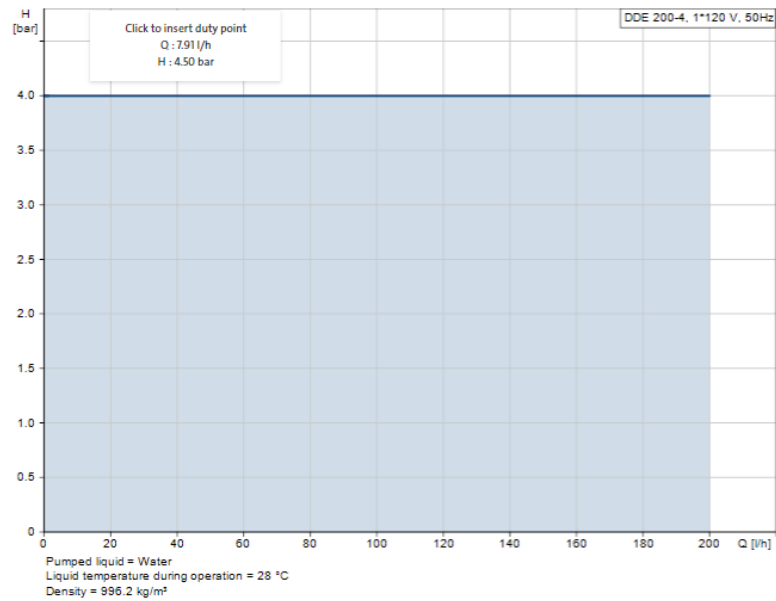
Standard specification

Model	Frame number	Motor			Impeller				Shaft length (mm)
		Power (kW)	Number of poles (P)	Phase and voltage (V)	Frequency (Hz)	Revolution (min ⁻¹)	Diameter (mm)	Stage	
A720-0.065A	1	0.065	4	Single-phase 100	50	300	150	1	600
60					360				
A720-0.1A	1	0.1	4	Single-phase 100	50	300	220	1	800
60					360				
A720-0.1B	1	0.1	4	Three-phase 200	50	300	220	1	800
60					360				
A720-0.2A	2	0.2	4	Single-phase 100	50	300	270	1	1000
60					360				
A720-0.2B	2	0.2	4	Three-phase 200	50	300	270	1	1000
60					360				
A720-0.4B	3	0.4	4	Three-phase 200	50	300	310	1	1250
60	360								
A725-0.4B	4	0.4	6	Three-phase 200	50	200	350	1	1500
60					240				
A720-0.75B	4	0.75	4	Three-phase 200	50	300	350	1	1500
60					360				
A725-0.75B	5	0.75	6	Three-phase 200	50	200	400	1	2000
60					240				
A720-1.5B	5	1.5	4	Three-phase 200	50	300	400	1	2000
60					360				

* The standard materials for the shaft and the impeller are SUS304 or SUS316.
 * The A720 and A725 are the replacement for the A520.

Gambar A. 6 Tabel Spesifikasi Motor Pengaduk Tangki Pembubuh Koagulan, Tangki Koagulan, dan Tangki Desinfeksi Merk Satake

Sumber: https://www.satake.co.jp/en/product/catalog/data/02_aseries.pdf



Gambar A. 7 Grafik Dosing Pump untuk Koagulasi merk Grundfos tipe DDE 200-4

Sumber: <https://product-selection.grundfos.com/id/products/dosing-pumps-digital/dde/dde-200-4-99159356?pumpssystemid=1717361537&tab=variant-curves>

Model	HLBQ-170	HLBQ-215	HLBQ-270	HLBQ-330	HLBQ-500
Bubble Type	Coarse Bubble	Fine Bubble	Fine Bubble	Fine Bubble	Fine Bubble
Size	8 inch	8 inch	9 inch	12 inch	675/215mm
MOC	EPDM/Silicone/PTFE - ABS/Strengthened PP-GF				
Connector	3/4"NPT male thread				
Membrane Thickness	2mm	2mm	2mm	2mm	2mm
Bubble Size	4-5mm	1-2mm	1-3mm	1-2mm	1-2mm
Design Flow	1-5m ³ /h	1.5-7.6m ³ /h	3-4m ³ /h	5-6m ³ /h	6-14m ³ /h
Flow Range	6-4m ³ /h	1-6m ³ /h	1-6m ³ /h	1-12m ³ /h	1-16m ³ /h
SOTE	≥10%	≥38%	≥38%	≥38%	≥40%
	(6m submerged)	(6m submerged)	(6m submerged)	(6m submerged)	(6m submerged)
SOTR	±0.21kg O ₂ /h	±0.31kg O ₂ /h	±0.46kg O ₂ /h	±0.75kg O ₂ /h	±0.89kg O ₂ /h
SAE	±7.5kg O ₂ /kw/h	±5.9kg O ₂ /kw/h	±6.9kg O ₂ /kw/h	±8.9kg O ₂ /kw/h	±9.2kg O ₂ /kw/h
Headloss	2000-3000Pa	1500-4300Pa	1500-4300Pa	1500-4300Pa	2500-3500Pa
Service Area	0.5-0.8m ² /pcs	0.2-0.64m ² /pcs	0.25-1.0m ² /pcs	0.4-1.6m ² /pcs	0.5-0.25m ² /pcs
Service Life	> 5 years				

Gambar A. 8 Gambar Spesifikasi Diffuser Fine Bubble untuk Aerasi tipe HLBQ-270

Sumber: <https://www.hollyhb.com/diffuser/high-efficient-wastewater-treatment-fine.html>

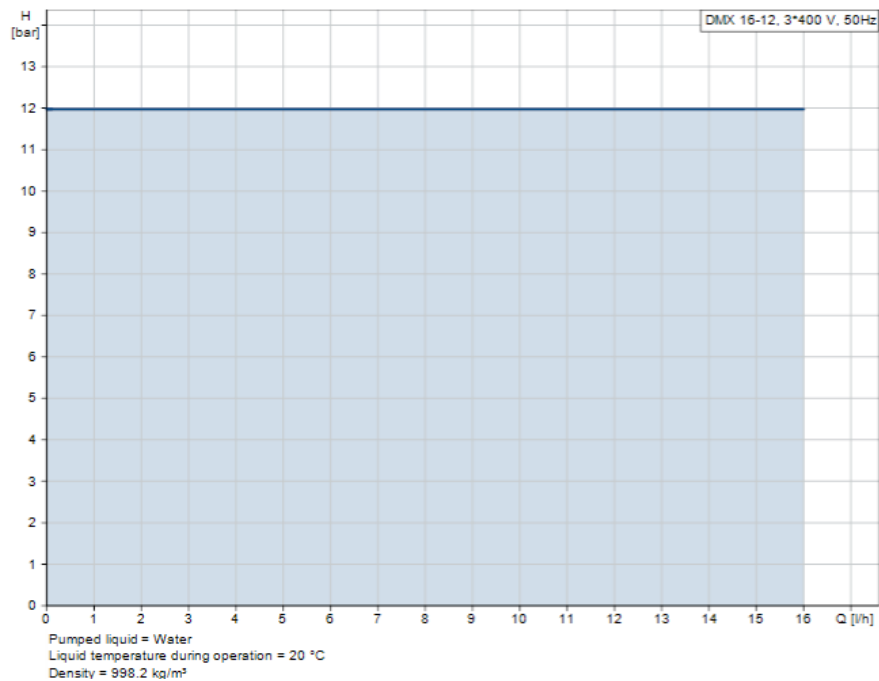
■ BP · BL type SPECIFICATION

Hz	Type		Motor				Bore		Maxi. Discharge	Maxi. Capacity	Noise	L x W x H	Weight
	BP	BL	HP	kW	PH	V	inch	mm	mm ³ /q	m ³ /min	dB(A)	mm	kG
50	BP-0212	BL-0212	1/4	0.2	1	220~240	2-1/2	65	100	2.1	50	250x345x305	11
	BP-0512	BL-0512	1/2	0.37	1	220~240	3	80	130	6.3	58	295x350x340	17
	BP-0532	BL-0532											
	BP-112	BL-112											
	BP-132	BL-132	1	0.75	3	220~440	4	100	220	15.7	64	365x425x410	20.5
	BP-232	BL-232	2	1.5	3	220~440	4	100	230	18.3	72	370x490x480	27
	BP-332	BL-332	3	2.2	3	220~440	5	125	230	35.0	76	445x550x540	36
	BP-532	BL-532	5	3.7	3	220~440	6	150	300	35.0	80	510x660x620	48
BP-632	BL-632	5	3.7	3	220~440	6	150	350	44.3	100	510x660x620	48	
60	BP-0212	BL-0212	1/4	0.2	1	220~240	2-1/2	65	120	3.4	62	250x345x305	11
	BP-0512	BL-0512	1/2	0.37	1	220~240	3	80	150	8.5	70	295x350x340	17
	BP-0532	BL-0532											
	BP-112	BL-112											
	BP-132	BL-132	1	0.75	3	220~440	4	100	240	18.3	80	365x425x410	20.5
	BP-232	BL-232	2	1.5	3	220~440	4	100	300	21.5	90	370x490x480	27
	BP-332	BL-332	3	2.2	3	220~440	5	125	335	40.0	95	445x550x540	36
	BP-532	BL-532	5	3.7	3	220~440	6	150	350	44.3	100	510x660x620	48
BP-632	BL-632	5	3.7	3	220~440	6	150	350	44.3	100	510x660x620	48	

BP Type Turbo Blower
BL Type Turbo Blower with * Flow Regulating Disc*

Gambar A. 9 Gambar Spesifikasi Blower Showfou untuk Aerasi

Sumber: <https://www.showfoupump.com/product-detail/turbo-blower-bs/>



Gambar A. 10 Grafik Dosing Pump untuk Desinfeksi merk Grundfos Tipe DMX 16-12

Sumber: <https://product-selection.grundfos.com/id/products/dosing-pumps-mechanical/dmx/dmx-16-12-99205965?pumpsystemid=1717375579&tab=variant-curves>

TEMPERATURE (°C)	DENSITY (gm/cm ³ , ρ)	ABSOLUTE VISCOSITY (centipoise, μ)	KINEMATIC VISCOSITY (centistokes, ν)
0	0.99987	1.7923	1.7923
1	0.99993	1.7320	1.7321
2	0.99997	1.6740	1.6741
3	0.99999	1.6193	1.6193
4	1.00000	1.5676	1.5676
5	0.99999	1.5188	1.5188
6	0.99997	1.4726	1.4726
7	0.99993	1.4288	1.4288
8	0.99986	1.3872	1.3872
9	0.99977	1.3476	1.3476
10	0.99967	1.3097	1.3101
11	0.99953	1.2735	1.2740
12	0.99935	1.2390	1.2396
13	0.99914	1.2061	1.2068
14	0.99891	1.1748	1.1756
15	0.99865	1.1447	1.1457
16	0.99837	1.1156	1.1168
17	0.99806	1.0876	1.0888
18	0.99772	1.0603	1.0618
19	0.99735	1.0340	1.0356
20	0.99695	1.0087	1.0105
21	0.99651	0.9843	0.9863
22	0.99603	0.9606	0.9629
23	0.99551	0.9380	0.9405
24	0.99495	0.9161	0.9186
25	0.99435	0.8949	0.8975
26	0.99371	0.8746	0.8774
27	0.99303	0.8551	0.8581
28	0.99231	0.8363	0.8394
29	0.99155	0.8181	0.8214
30	0.99075	0.8004	0.8039
31	0.98991	0.7831	0.7867
32	0.98903	0.7670	0.7707

Gambar A. 11 Densitas, Viskositas Absolut, dan Viskositas Kinematis Air

Sumber: Reynolds & Richards, 1996

Item	Model	Flow (m ³ /h)	Head (m)	Efficiency (%)	NPSHa (m)	Inlet x outlet (mm)	Motor Power (KW)	Pump and motor weight (kg)
8	UHB-ZK65/25-80	15	82	35	4.50	65*50	18.50	
		*25	80	40				
		35	72	40				
9	UHB-ZK80/45-35	30	37	33	3.50	80*65	15.00	260.00
		*45	35	40				
		55	30	36				
10	UHB-ZK80/50-20	35	22	32	4.00	80*65	11.00	250.00
		*50	20	39				
		60	17	30				
11	UHB-ZK80/50-30	35	32	33	3.50	80*65	15.00	250.00
		*50	30	40				
		60	25	36				
12	UHB-ZK80/50-50	35	52	33	4.00	80*65	18.50	280.00
		*50	50	41				
		60	45	38				
13	UHB-ZK80/50-80	35	82	40	5.00	80*65	30.00	
		*50	80	50				
		60	72	48				
14	UHB-ZK100/60-35	50	37	38	4.00	100*80	18.50	345.00
		*60	35	40				
		80	30	42				
15	UHB-ZK100/60-50	50	52	37	4.00	100*80	22.00	380.00
		*60	50	40				
		70	45	42				
16	UHB-ZK100/100-40	70	45	41	4.00	100*80	30.00	440.00
		*100	40	40				
		110	35	33				
17	UHB-ZK100/100-80	65	82	45	5.50	100*80	45.00	
		*100	80	55				
		120	65	50				
18	UHB-ZK125/140-28	70	32	35	5.00	125*100	30.00	400.00
		*140	28	46				
		150	22	35				

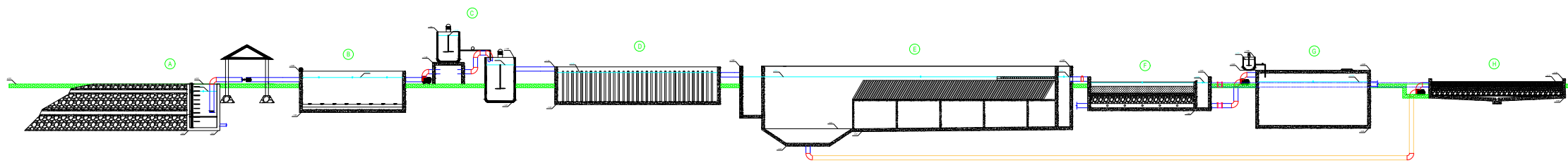
Gambar A. 12 Spesifikasi Pomba Slurry

Sumber:

https://www.google.com/url?sa=t&source=web&cd=&cad=rja&uact=8&ved=2ahUKewjLsOeK7_b7AhXwSGwGHW-4DnAQFnoECBIQAQ&url=https%3A%2F%2Fwww.sbm.com.cn%2Fuhb-zk-slurry-pump-50.html&usg=AOvVaw0hITPchExMG8V9uebc1Hkg

LAMPIRAN B

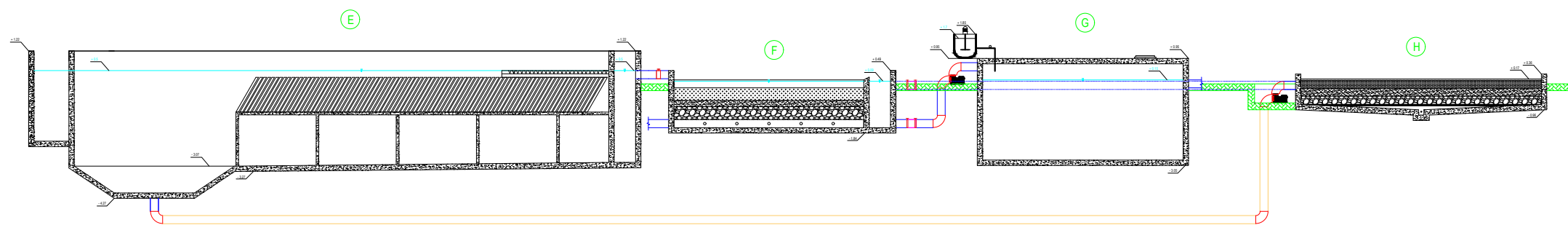
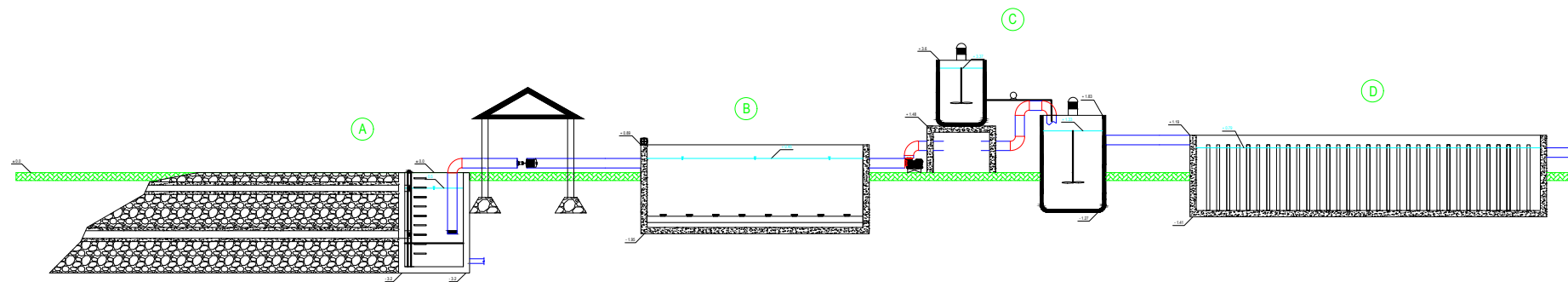
**GAMBAR DENAH DAN POTONGAN DARI SETIAP UNIT
PENGOLAHAN**



- A. INTAKE dan BAR SCREEN
- B. AERASI
- C. KOAGULASI
- D. FLOKULASI
- E. SEDIMENTASI
- F. FILTRASI
- G. DESINFEKSI DAN RESERVOIR
- H. SLUDGE DRYING BED



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EUIS NURUL H., PhD

DOSEN PEMBIMBING

RIZKA NOVEMBRIANTO, ST., MT.

MAHASISWA

SITI NURISTA FITRIANI
SHALZAFATIHAH SALAMAH

NPM

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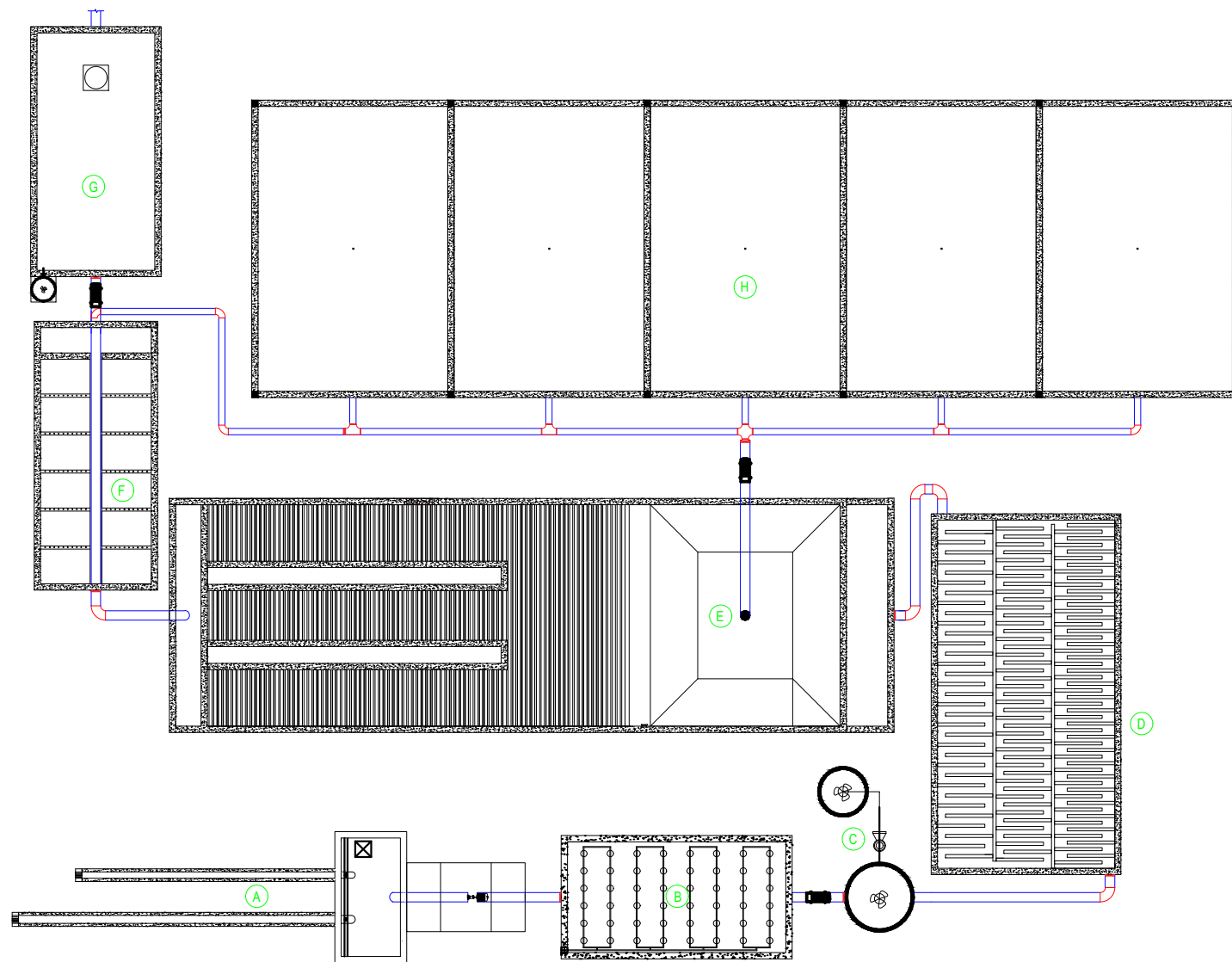
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SKALA

PROFIL HIDROLIS

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LEGENDA



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- B. AERASI
- C. KOAGULASI
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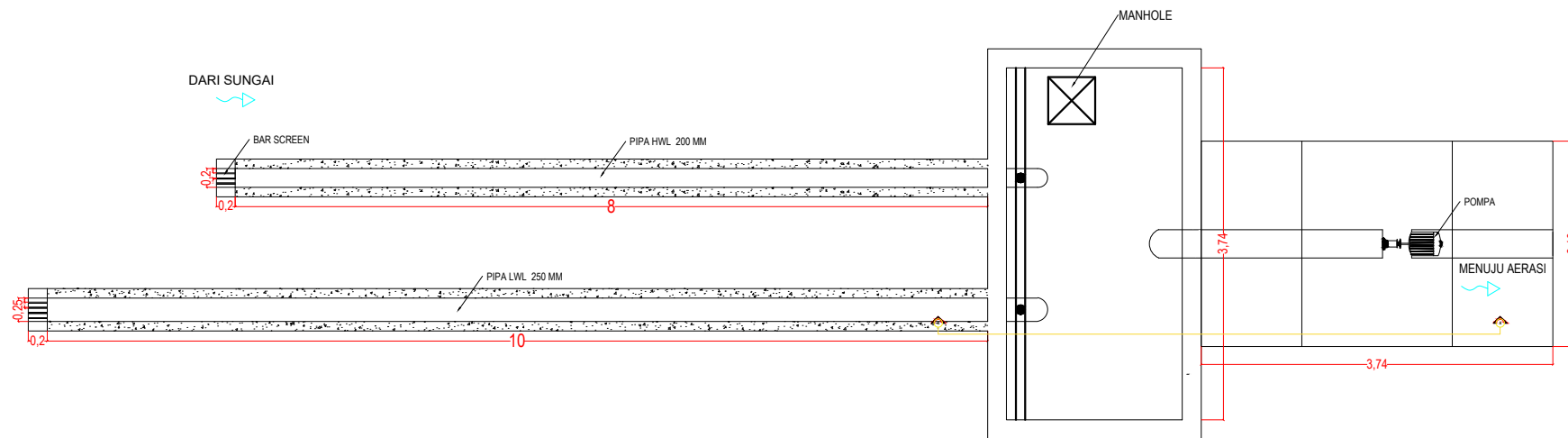
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SKALA

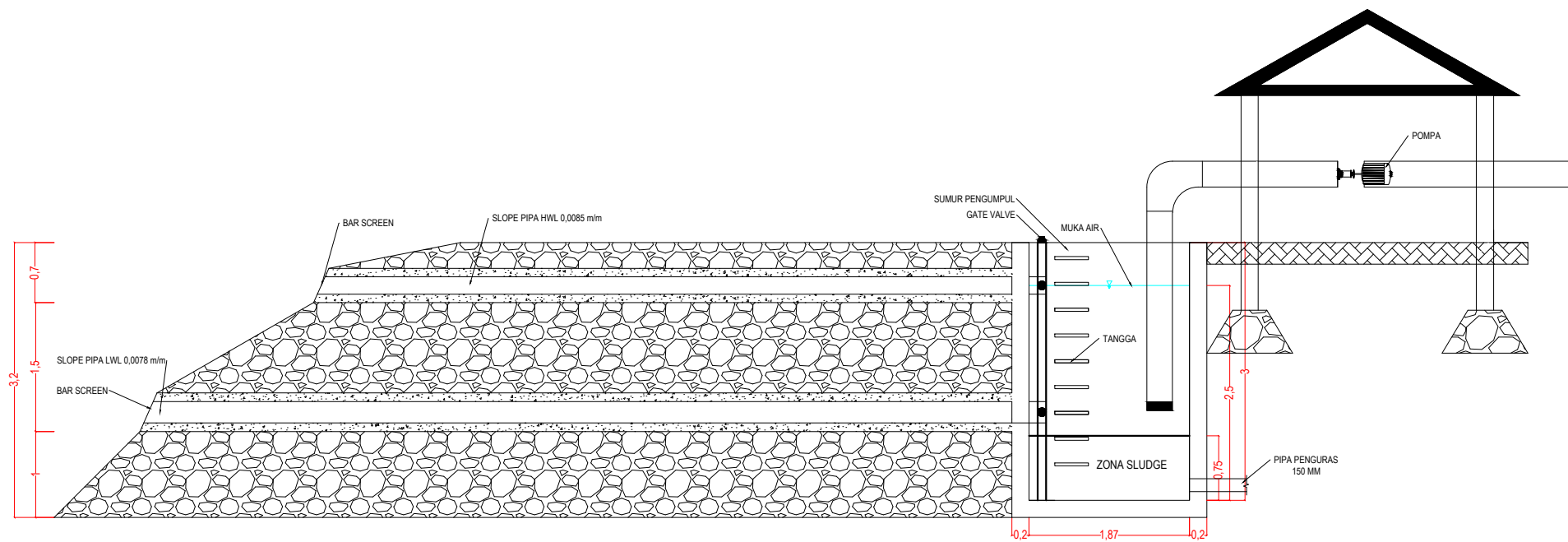
LAYOUT

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LEGENDA



DENAH INTAKE
1:70



POTONGAN A - A INTAKE
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GAMBAR

SKALA

DENAH INTAKE
POTONGAN A - A

1:70

LEGENDA



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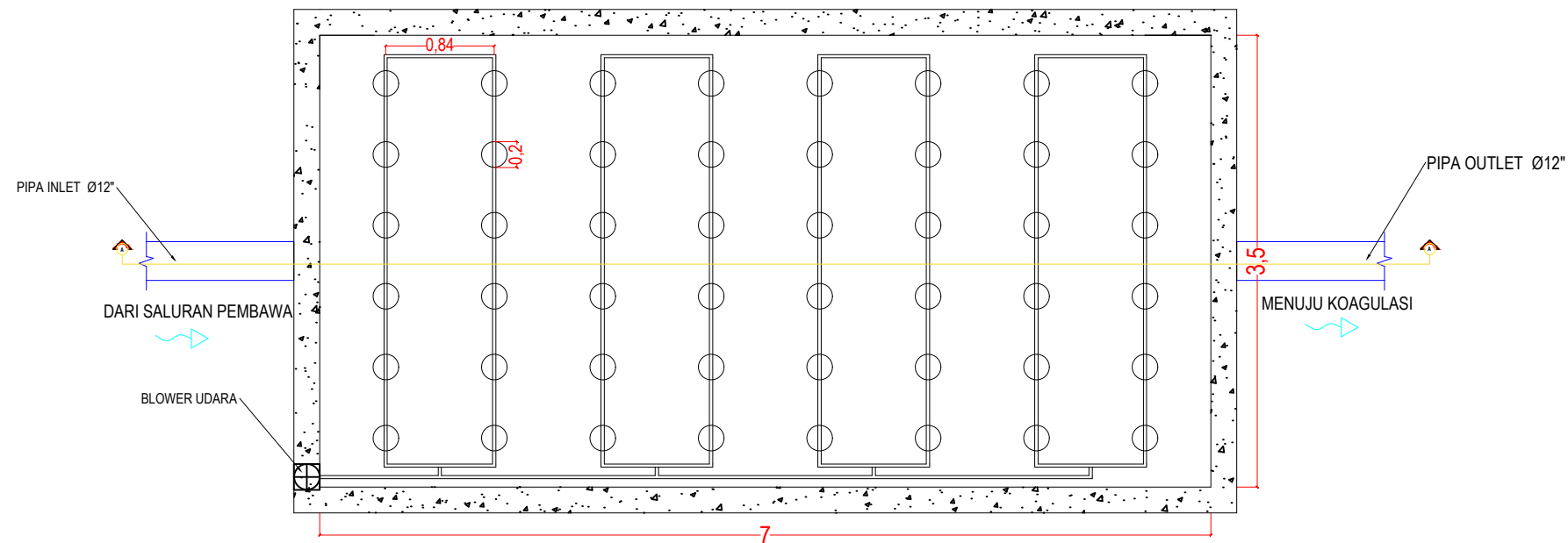
GAMBAR

SKALA

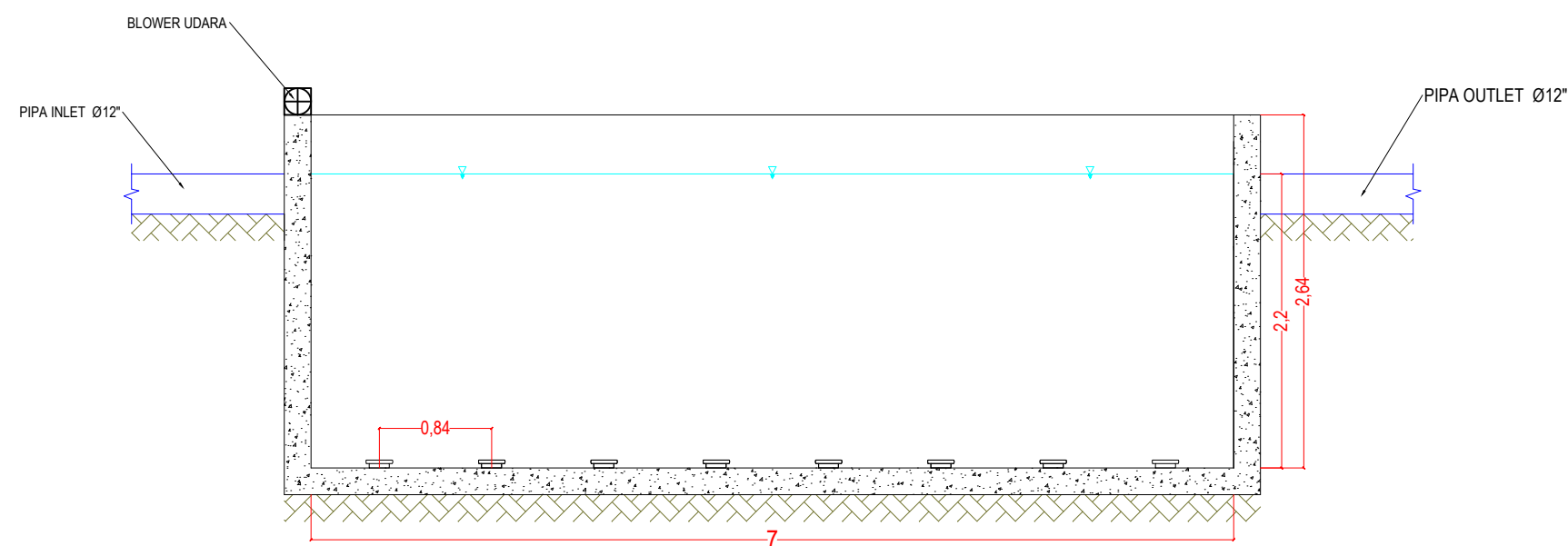
DENAH BAK AERASI
POTONGAN A - A
BAK AERASI

1:50

LEGENDA



DENAH BAK AERASI
1:50



POTONGAN A - A BAK AERASI
1:50



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NPM

SITI NURISTA FITRIANI
SHALZAFATIHAH SALAMAH

19034010001
19034010028

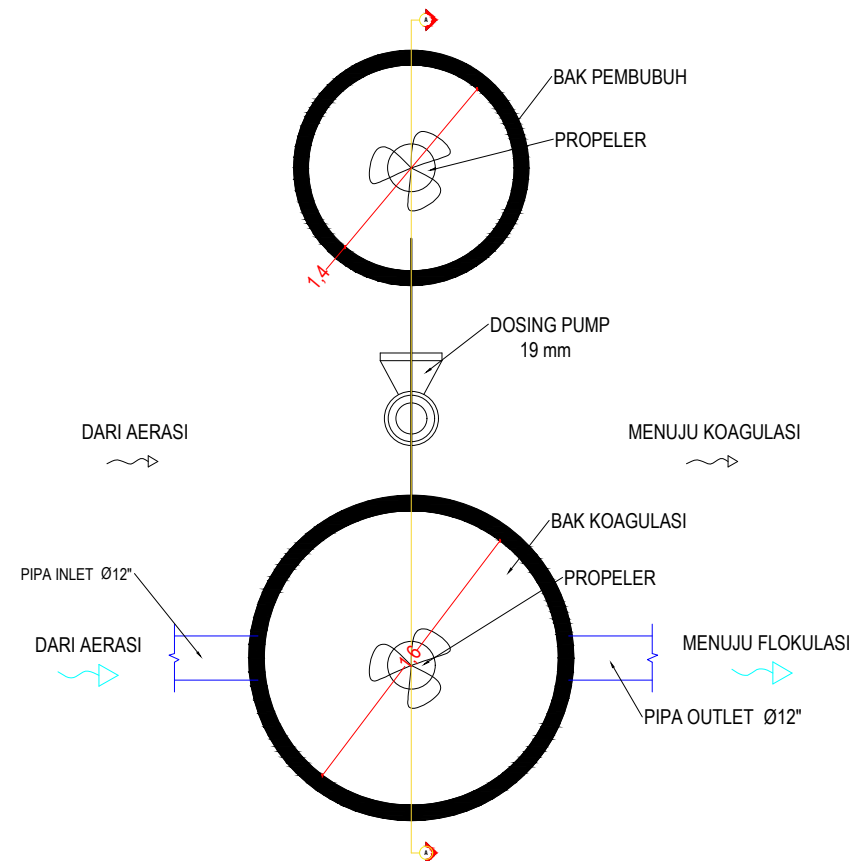
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SKALA

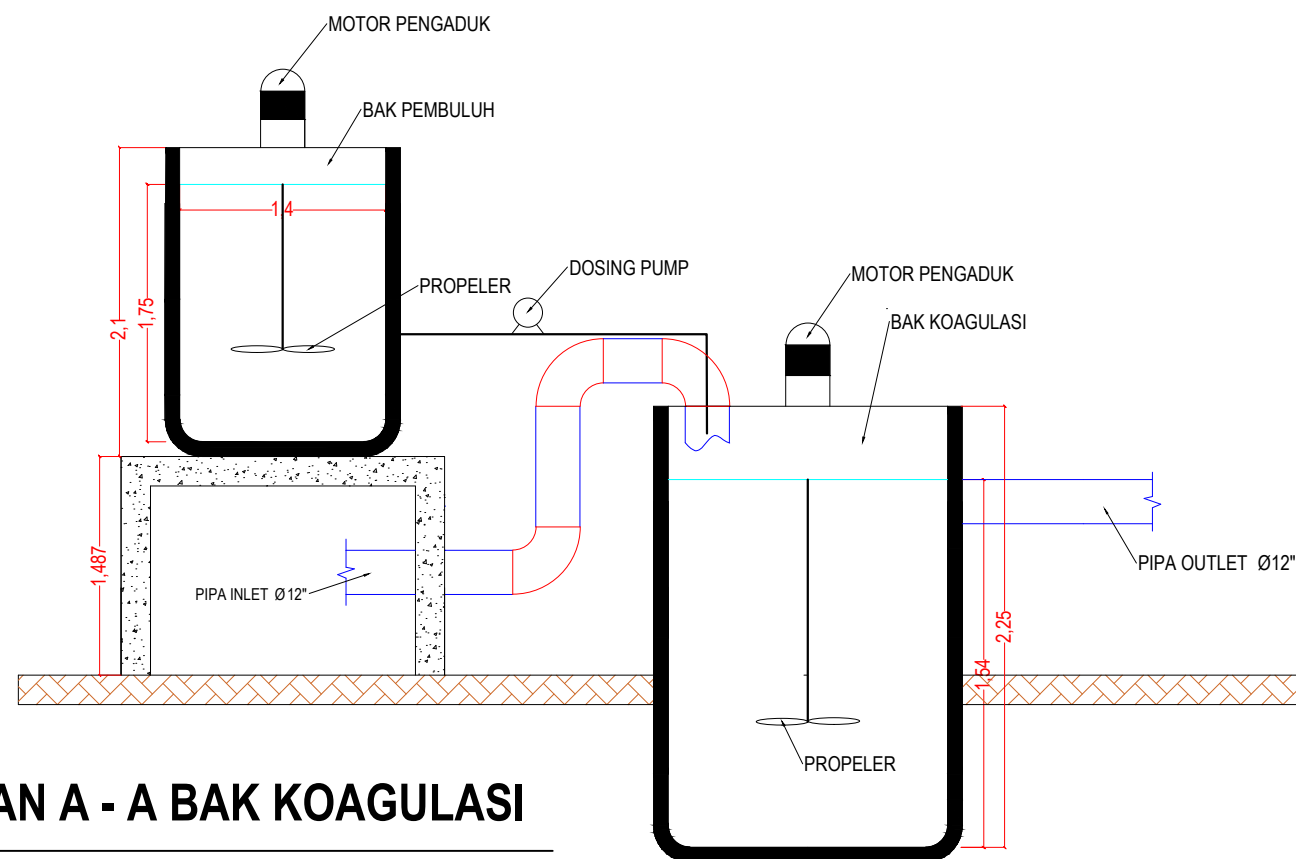
DENAH BAK KOAGULASI
POTONGAN A - A
BAK KOAGULASI

1:50

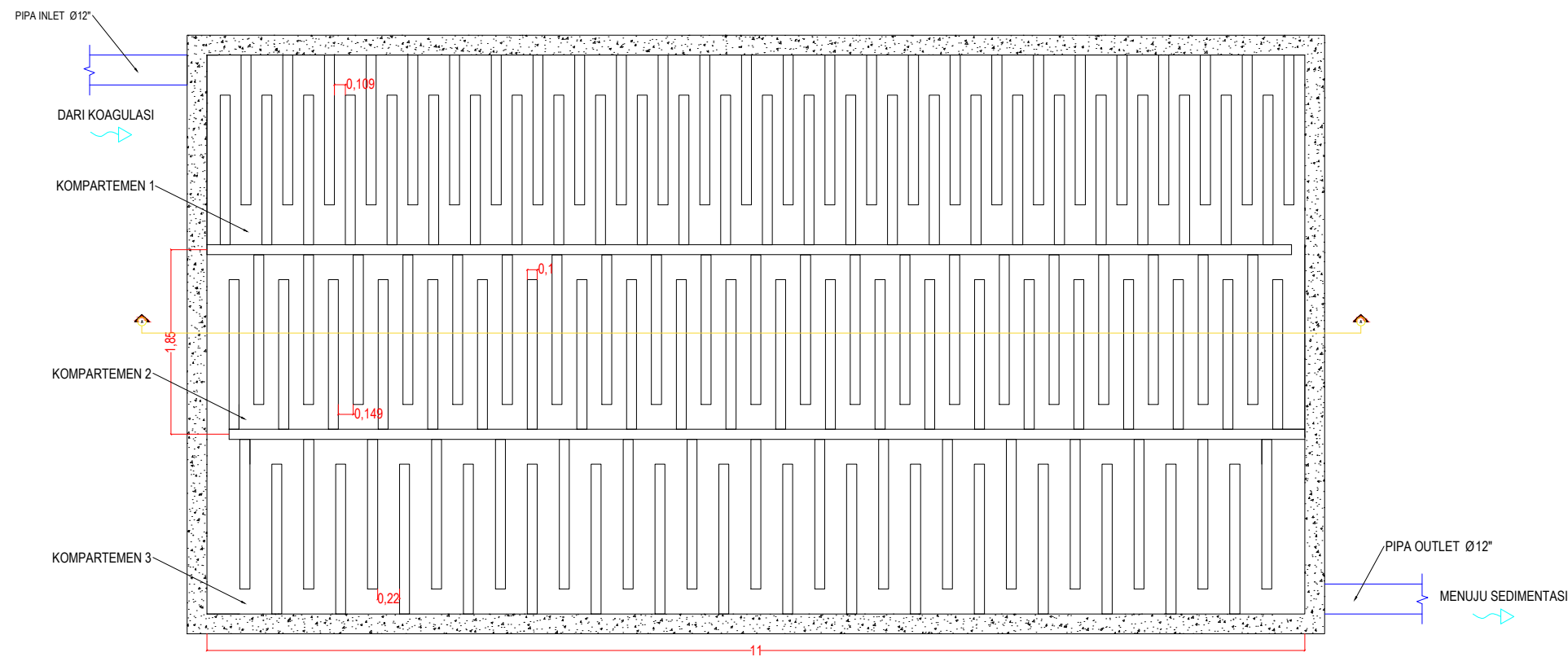
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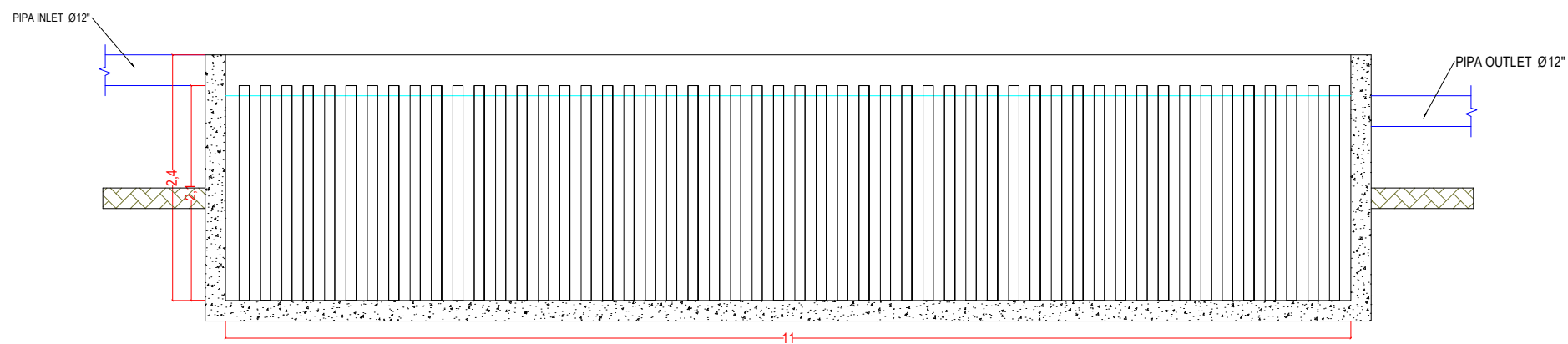
DENAH BAK KOAGULASI
1:50



POTONGAN A - A BAK KOAGULASI
1:50



DENAH BAK FLOKULASI
1:60



POTONGAN A - A BAK FLOKULASI
1:60



UNIVERSITAS PEMBANGUNAN NASIONAL
"VETERAN" JAWA TIMUR
FAKULTAS TEKNIK
PROGRAM STUDI TEKNIK LINGKUNGAN

TUGAS

PERANCANGAN BANGUNAN
PENGOLAHAN AIR MINUM
(PBPAM)

DOSEN PENGAMPUN

EUIS NURUL H., PhD

DOSEN PEMBIMBING

RIZKA NOVEMBRIANTO, ST., MT.

MAHASISWA

SITI NURISTA FITRIANI
SHALZAFATIHAH SALAMAH

NPM

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GAMBAR

SKALA

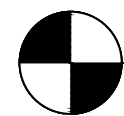
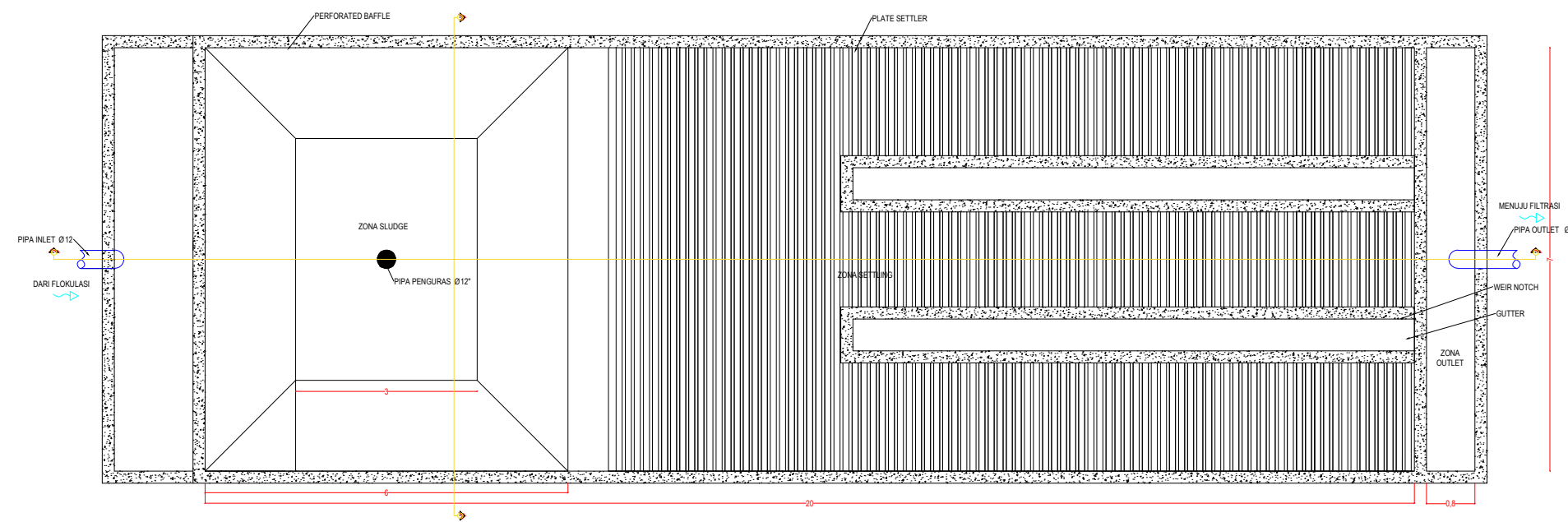
DENAH BAK FLOKULASI
POTONGAN A - A
BAK FLOKULASI

1:60

LEGENDA



UNIVERSITAS PEMBANGUNAN NASIONAL
"VETERAN" JAWA TIMUR
FAKULTAS TEKNIK
PROGRAM STUDI TEKNIK LINGKUNGAN



DENAH SEDIMENTASI

1:100

TUGAS

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PENGOLAHAN AIR MINUM
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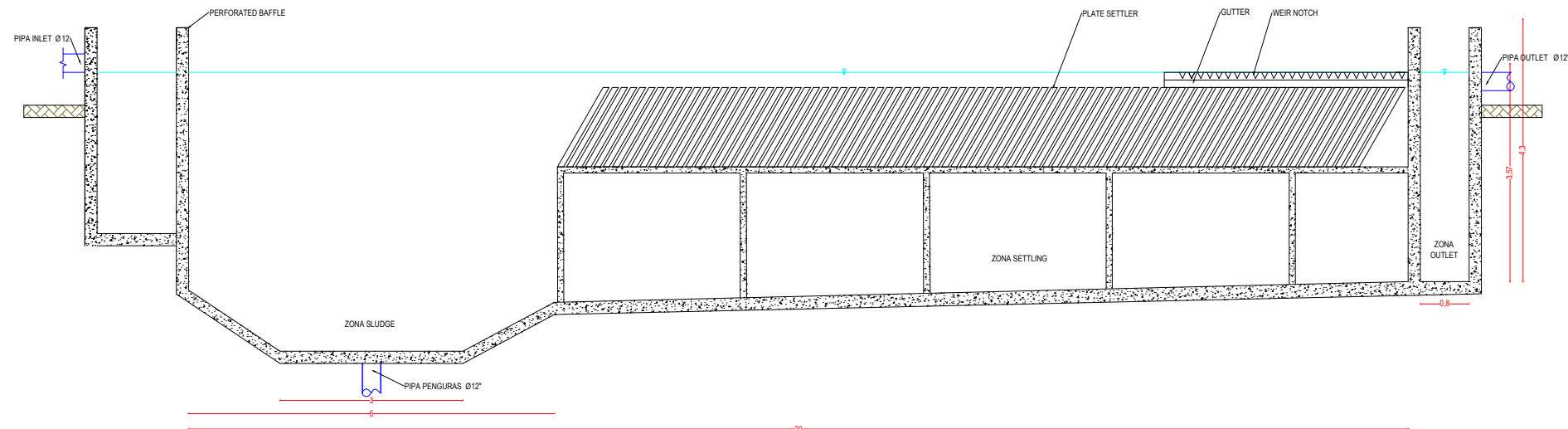
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SKALA

DENAH SEDIMENTASI

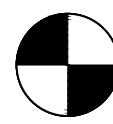
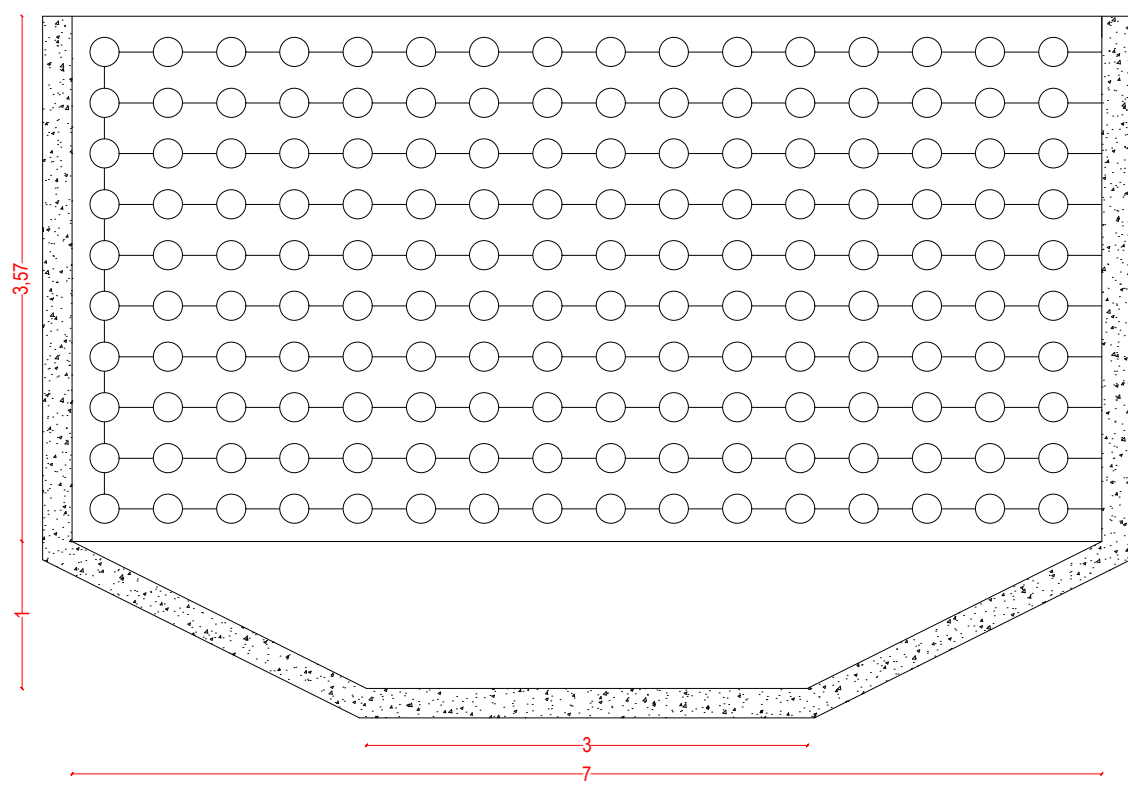
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LEGENDA



POTONGAN A - A SEDIMENTASI

1:40



POTONGAN B - B SEDIMENTASI

1:50

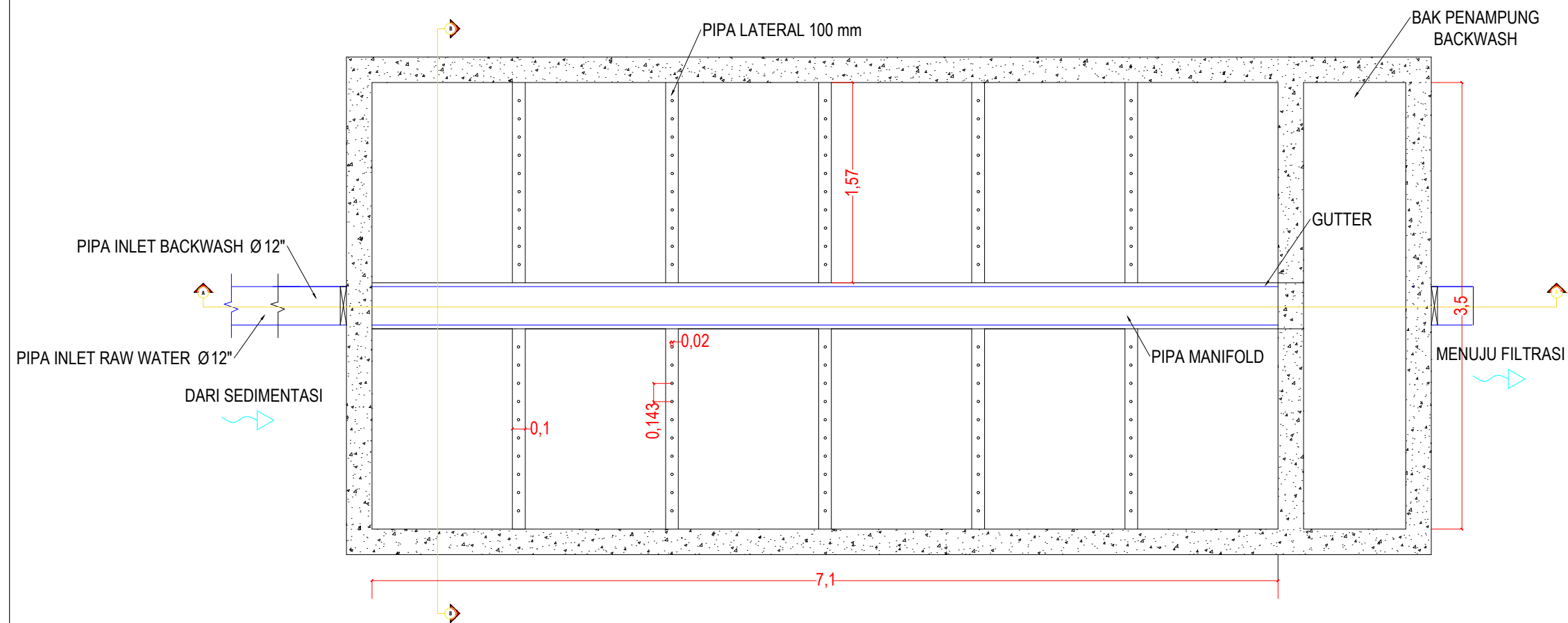


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TUGAS	
PERANCANGAN BANGUNAN PENGOLAHAN AIR MINUM (PBPAM)	
DOSEN PENGAMPUN	
EUIS NURUL H., PhD	
DOSEN PEMBIMBING	
RIZKA NOVEMBRIANTO, ST., MT.	
MAHASISWA	NPM
SITI NURISTA FITRIANI SHALZAFATIHAH SALAMAH	19034010001 19034010028
GAMBAR	SKALA
POTONGAN A - A POTONGAN B - B SEDIMENTASI	1:100 1:50
LEGENDA	



UNIVERSITAS PEMBANGUNAN NASIONAL
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FAKULTAS TEKNIK
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DENAH FILTRASI
1:40

TUGAS

PERANCANGAN BANGUNAN
PENGOLAHAN AIR MINUM
(BPAM)

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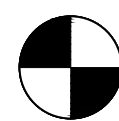
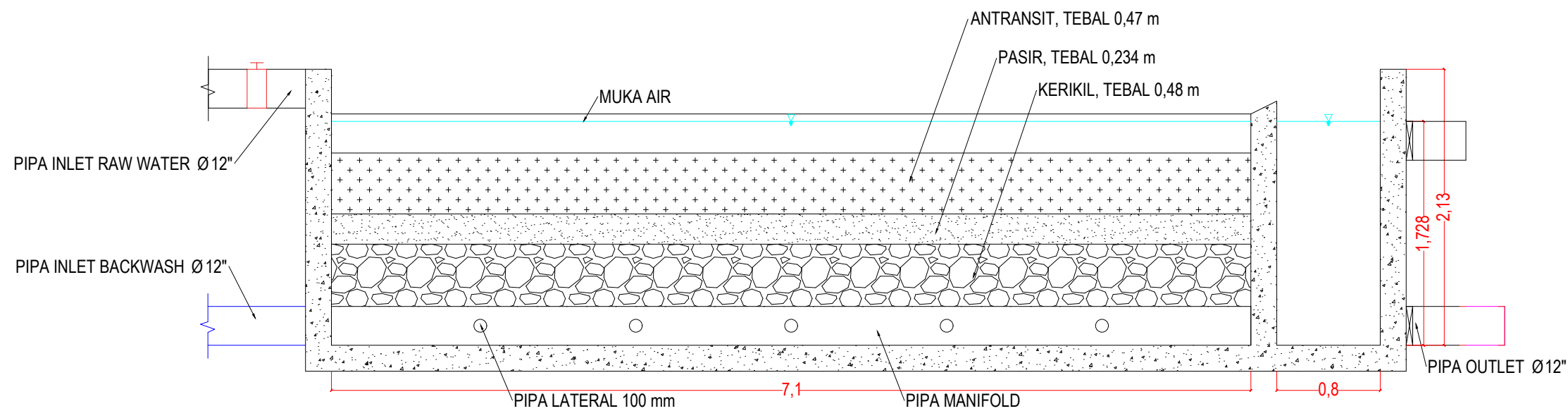
DENAH FILTRASI

1:40

LEGENDA

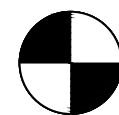
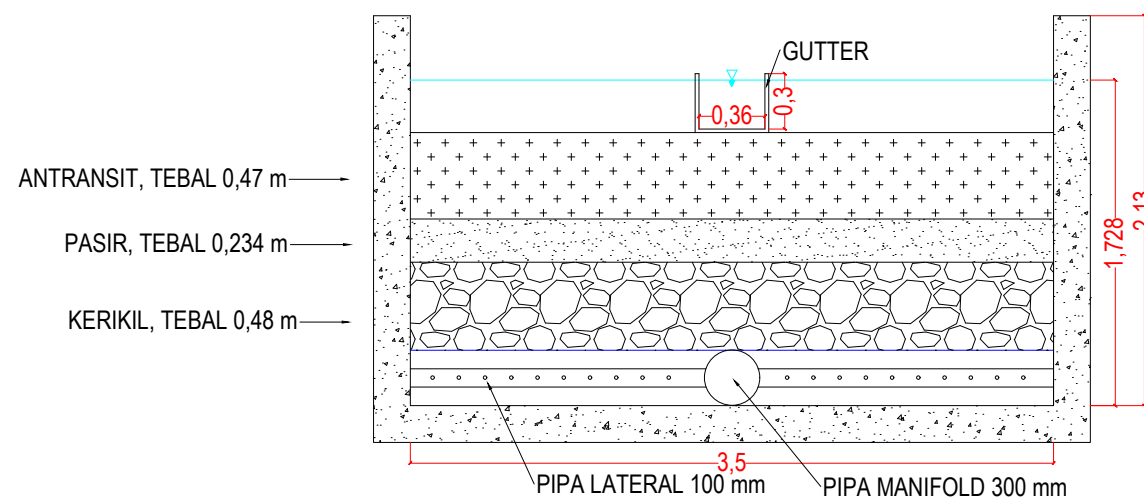


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POTONGAN A - A FILTRASI

1:40



POTONGAN B - B FILTRASI

1:40

TUGAS

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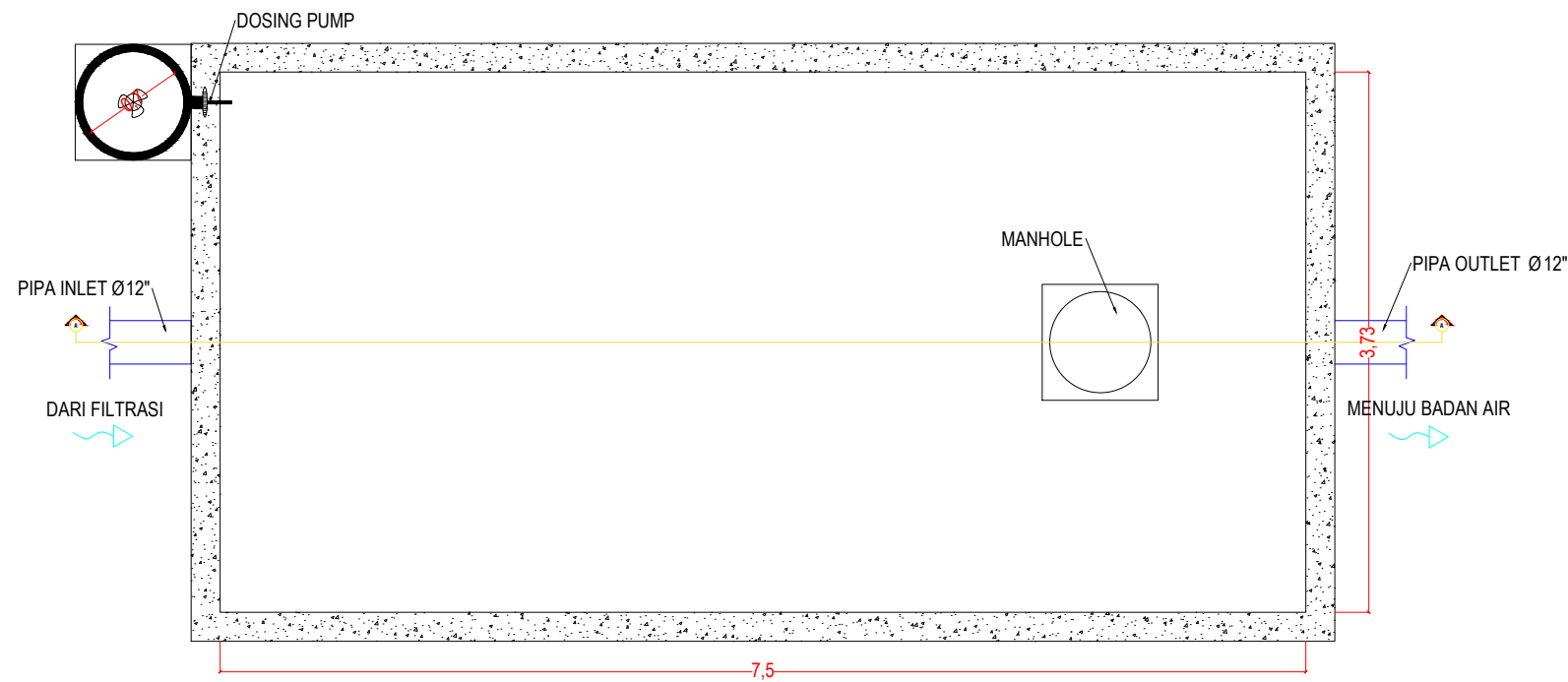
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POTONGAN A - A
POTONGAN B - B
FILTRASI

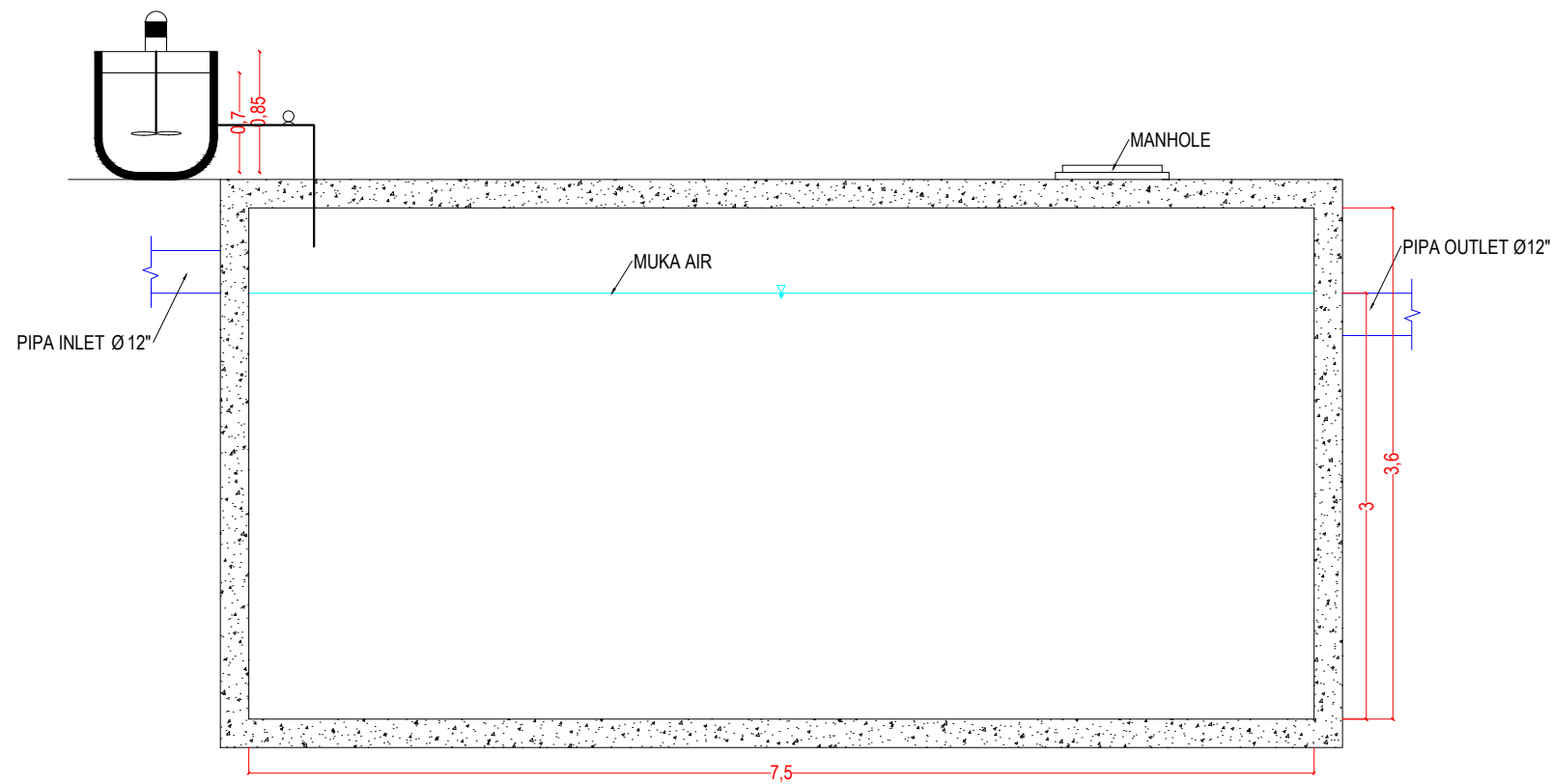
SKALA

1:40

LEGENDA



DENAH DESINFEKSI dan RESERVOAR
1:50



POTONGAN A - A DESINFEKSI dan RESERVOAR
1:50



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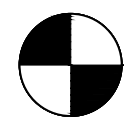
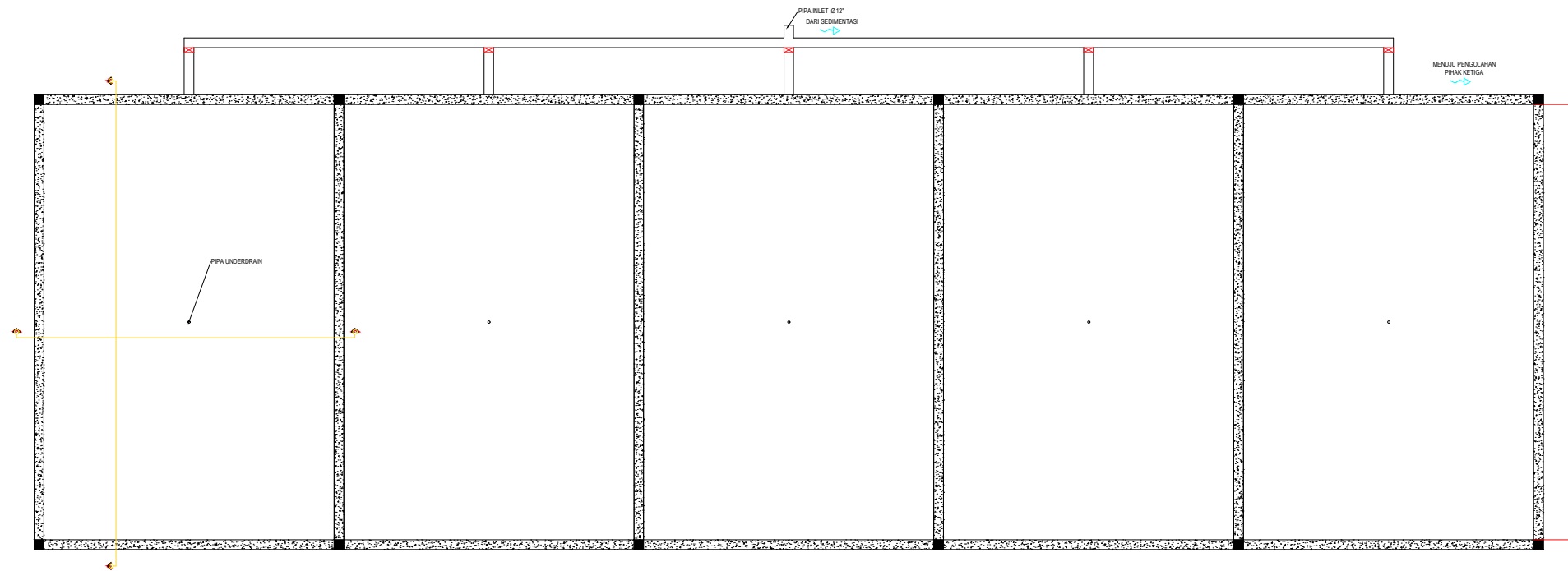
DENAH
POTONGAN A - A
DESINFEKSI dan RESERVOAR

1:50

LEGENDA



UNIVERSITAS PEMBANGUNAN NASIONAL
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DENAH SLUDGE DRYING BED

1:125

TUGAS

PERANCANGAN BANGUNAN
PENGOLAHAN AIR MINUM
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DENAH
SLUDGE DRYING BED

1:125

LEGENDA



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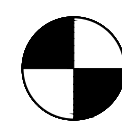
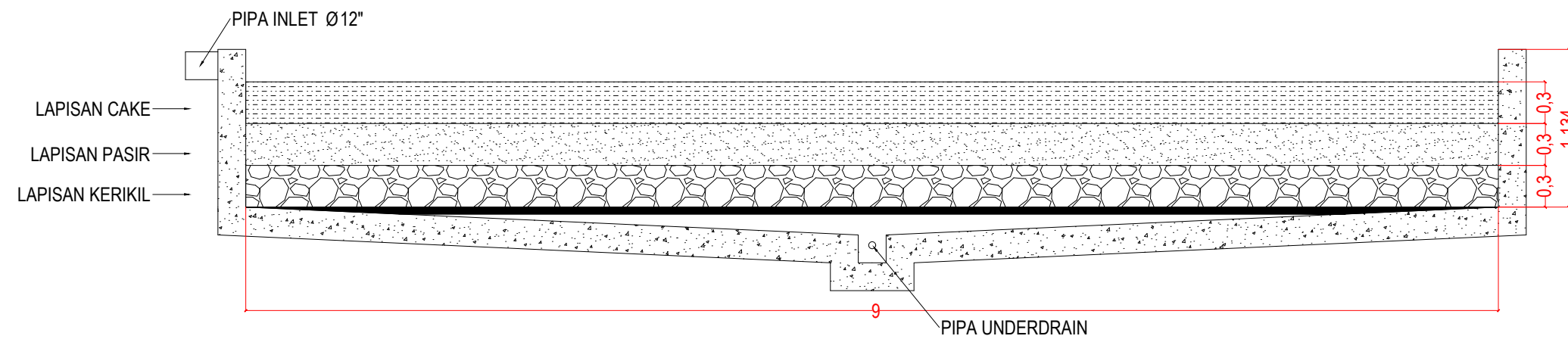
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SKALA

POTONGAN A - A
POTONGAN B - B
SLUDGE DRYING BED

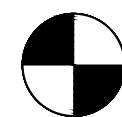
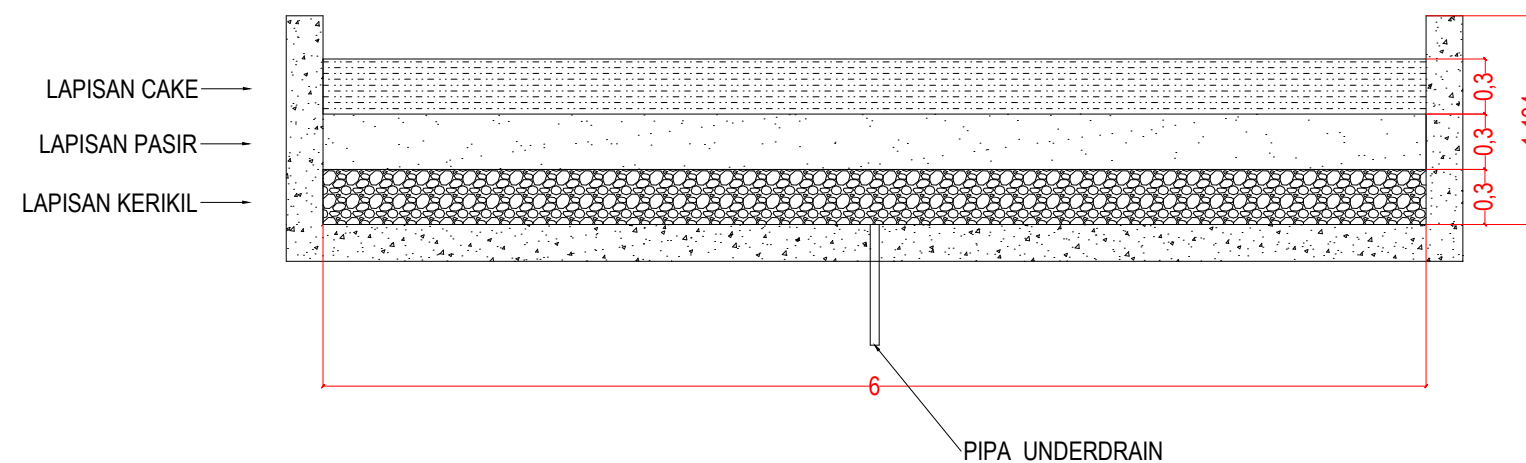
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LEGENDA



POTONGAN A - A SLUDGE DRYING BED

1:40



POTONGAN B - B SLUDGE DRYING BED

1:40