

LAMPIRAN A

**DETAIL SPESIFIKSI, AKSESORIS, DAN
PELENGKAP UNIT PENGOLAHAN AIR LIMBAH
RUMAH SAKIT**

LAMPIRAN A

SPESIFIKASI AKSESORIS DAN PELENGKAP UNIT BANGUNAN

1. BAK PENAMPUNG AWAL AIR LIMBAH

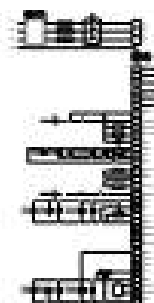
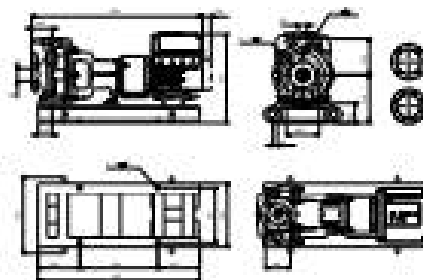
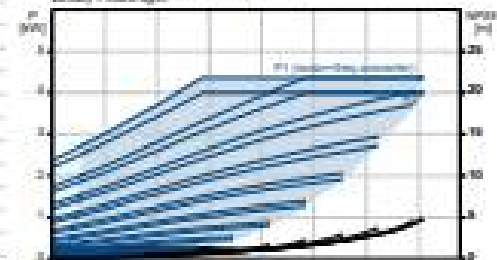
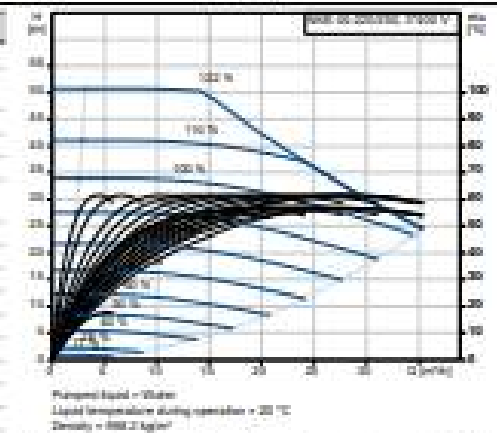
Menggunakan 1 unit pompa NKE 40 - 220/250 AA1F1S3ESBQQEKWA

		Company name: Created by: Phone: Date: 14/06/2024
Qty.	Description	
1	NKE 40-220/250 AA1F1S3ESBQQEKWA Note! Product picture may differ from actual product Product No.: On request. Non-self-priming, single-stage, centrifugal pump designed according to ISO 5199 with dimensions and rated performance according to EN 733. Flanges are PN 10 with dimensions according to EN 1052-2. The pump has an axial suction port, a radial discharge port and horizontal shaft. It is of the back pull-out design enabling removal of the motor, coupling, bearing bracket and impeller without disturbing the pump housing or pipework. The unbalanced rubber bellows seal is according to DIN EN 12756. The pump is fitted with a foot-mounted, fan-cooled, permanent-magnet synchronous motor. Pump and motor are mounted on a common base frame. The motor includes a frequency converter and PI controller in the motor terminal box. This enables continuously variable control of the motor speed, which again enables adaptation of the performance to a given requirement. The product's minimum efficiency index (MEI) is greater or equal to 0.70. This is by the Commission Regulation (EU) considered as an indicative benchmark for best-performing water pump available on the market as from 1 January 2013. An external sensor can be connected if controlled pump operation is required for flow, differential pressure or temperature control. The operating panel on the motor terminal box features a four-inch TFT display, push-buttons and the Grundfos Eye indicator. The display gives an intuitive and user-friendly interface to all functions. The push-buttons are used to navigate through the menu structure to access pump and performance data on site and enable setting of required setpoint as well as setting of pump to "Min." or "Max." operation or to "Stop". The Grundfos Eye indicator on the operating panel provides visual indication of pump status: • "Power on": Motor is running (rotating green indicator lights) or not running (permanently green indicator lights) • "Warning": Motor is still running (rotating yellow indicator lights) or has stopped (permanently yellow indicator lights) • "Alarm": Motor has stopped (flashing red indicator lights). Communication with the pump is also possible by means of Grundfos GO Remote (accessory). The remote control enables further settings as well as reading out of a number of parameters such as "Actual value", "Speed", "Power input" and total "Power consumption". Pump and motor are mounted on a common steel base frame in accordance with ISO 3881. The back pull-out design makes it possible to service the pump when the pump housing is still connected to the inlet and discharge pipes. 1) Remove the bolts in the bearing bracket support foot and motor foot. 2) Remove the bearing bracket and the motor from the pump housing. Pump The pump is fitted with an unbalanced rubber bellows seal with torque transmission across the spring and around the bellows. Due to the bellows, the seal does not wear the shaft, and the axial movement is not prevented by deposits on the shaft.	

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1

Description	Value
General information:	
Product name:	NKE 45-220/250 AA1P153ESB000KWA
Product No:	On request
EAN number:	On request
Technical:	
Pump speed on which pump data are based:	2200 rpm
Rated flow:	27.88 m³/h
Pump with motor (Yes/No):	Y
Rated head:	32.58 m
Actual impeller diameter:	250 mm
Nominal impeller diameter:	220
Shaft diameter:	24 mm
Code for shaft seal:	0000
Mechanical seal type:	Single
Curve tolerance:	ISO9906:2012 ZB
Pump version:	A1
Bearing design:	Standard
Materials:	
Pump housing:	Cast iron
Pump housing:	EN 1561 EN-GJL-250
Pump housing:	ASTM A48-35
Impeller:	Stainless steel
Impeller:	EN 1.4308
Impeller:	ASTM A351 CF8
Internal pump house coating:	Painting
Material code:	S3
Code for rubber:	E
Shaft:	Steel
Shaft:	EN 1.0503/1.4301
Shaft:	AISI 304/304L
Installation:	
Range of ambient temperature:	-20 ... 50 °C
Maximum operating pressure:	10 bar
Pipe connection standard:	EN 1000-2
Type of inlet connection:	DN
Type of outlet connection:	DN
Size of inlet connection:	DN 65
Size of outlet connection:	DN 40
Pressure rating for connection:	PN 10
Coupling type:	Flexible with spacer
Base frame design:	C-channel
Code for base frame:	341
Grouting (Yes/No):	N
Coated code:	F
Liquid:	
Pumped liquid:	Water
Liquid temperature range:	-25 ... 120 °C
Selected liquid temperature:	20 °C
Density:	999.2 kg/m³
Electrical data:	
Motor type:	112ME
Rated power - P2:	4 kW
Main frequency:	50 Hz
Rated voltage:	3 x 380-500 V
Rated current:	7.75-8.00 A
Cos phi - power factor:	0.93-0.97



Description	Value
Rated speed:	110-3300 rpm
IE Efficiency class:	IE5
Motor efficiency at full load:	90.3 %
Number of poles:	4
Enclosure class (IEC 34-S):	IP65
Insulation class (IEC 85):	F
Built-in motor protection:	ELIC
Motor No:	6005862
Bearing insulation type N-end:	Steel bearing
Controls:	
Control panel:	HME300 - Advanced
Function Module:	FM300 - Advanced
Frequency converter:	Built-in
Pressure sensor:	N
Others:	
Minimum efficiency index, MEI L:	0.70
Net weight:	122 kg
Gross weight:	144 kg
Shipping volume:	0.426 m³
Language on pump nameplate:	GB

2. DISSOLVED AIR FLOTATION (DAF)

- Menggunakan 1 unit skimmer VHPL-CHAIN-SKIMMER untuk memisahkan lumpur dan minyak

CHAIN SKIMMERS *The Way*




ASSEMBLY ON TANK

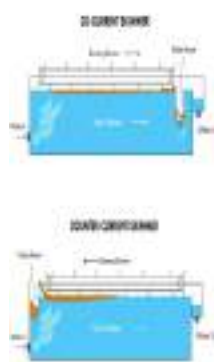
VH manufactures *THE WAY* CHAIN SKIMMERS fulfillin the requirement of **ONE SINGLE SOURCE** for all types of skimmers including- Belt, Tube, Disc, Drum, Floating type, Weir type, Skimmers

Fixed on DAF Dissolved Air Flotation Systems / Effluent Tanks

***THE WAY* Chain Skimmers** Consist of

- An assembly of two parallel arrays of Chains driven by Sprockets with a Gear Reduced Motor as the prime mover.
- The Chains carry a battery of wiper arms which rollover the sprockets and ensure skimming of the top layer of floating contaminants and disposed to a collection chamber to drain.

Continuous removal of floating contaminants reduces TSS,BOD & COD load on the effluent treatment plant significantly and reduces the upstream cost of treatment.



MOC OF SALIENT COMPONENTS	
Chains	MS/SS/Polymer Coated
Sprockets	MS/SS/Polymer Coated
Gear Box	Standard
Motor	Standard
Wiper	SS/Teflon
Wiper Arm	MS/SS Fabricated
Frame	MS/SS Fabricated
Bearings	Standard (Steel)
Supports	CI
Fasteners	MS/SS

- Menggunakan 1 unit blower Showfou Tipe RL-150 dengan daya 9,76 kW

COMPLETE SET ROOTS BLOWER INSTALLATION :
with standard accessories

■ PRESSURE OPERATION (RLC · RWC)

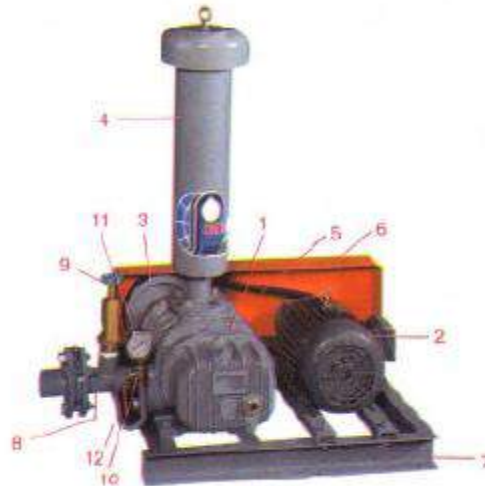


Fig 1

STANDARD ACCESSORIES

NO	NAME
1	BLOWER BODY
2	MOTOR
3	BLOWER PULLEY
4	SUCTION SILENCER SET (WITH AIR FILTER & COVER)
5	V-BELT
6	BELT COVER
7	BASE PLATE
8	T-TYPE REDUCER
9	PRESSURE SAFETY VALVE
10	BAFF VALVE
11	PRESSURE GAUGE
12	GAUGE PIPE

**RL PERFORMANCE TABLE
FOR PRESSURE OPERATION**

TYPE	Bore inch/mm	Revolution rpm	1000mmHg 5.0kpa		2000mmHg 10.0kpa		3000mmHg 15.0kpa		4000mmHg 20.0kpa		5000mmHg 25.0kpa		6000mmHg 30.0kpa		7000mmHg 35.0kpa		8000mmHg 40.0kpa	
			cf/min	kW	cf/min	kW	cf/min	kW	cf/min	kW	cf/min	kW	cf/min	kW	cf/min	kW	cf/min	kW
RL-125	5 (125)	800	11.0	5.3	10.1	5.5	9.3	7.6	8.5	10.0	7.8	14.1	7.2	17.1	6.5	20.8	6.0	25.2
		900	12.5	5.6	11.6	6.0	10.8	8.3	10.1	11.0	9.4	15.0	8.8	18.0	8.2	22.0	7.7	26.4
		1000	13.9	5.9	13.1	6.5	12.4	8.9	11.7	12.0	11.5	15.8	10.5	18.8	9.9	23.2	9.4	27.6
		1100	15.4	6.2	14.6	7.0	13.8	9.7	13.2	13.0	12.6	16.7	12.1	19.7	11.6	24.3	11.1	28.8
		1200	16.9	6.5	16.1	7.5	15.5	10.3	14.8	14.0	14.3	17.6	13.8	20.8	13.3	25.4	12.6	30.0
		1300	18.4	6.8	17.7	8.0	17.0	11.0	16.3	15.0	15.8	18.5	15.4	21.5	15.0	26.6	14.5	31.2
		1400	19.8	7.0	19.3	8.5	18.6	11.7	18.0	16.0	17.5	19.3	17.1	22.3	16.7	27.7	15.2	32.4
		1500	21.4	7.3	20.8	9.0	20.1	12.3	19.6	17.0	18.1	20.2	18.7	23.2	18.4	28.8	17.9	33.6
RL-150	6 (150)	800	17.0	7.6	16.0	9.0	15.1	12.2	14.0	15.3	13.4	19.0	12.7	25.0	12.3	28.5	11.8	30.0
		900	19.7	8.2	18.7	9.5	17.8	14.0	16.7	17.0	16.1	21.0	15.5	27.5	15.0	32.0	14.5	34.0
		1000	22.5	8.7	21.5	12.0	20.5	15.8	19.5	19.5	18.9	24.5	18.3	30.0	17.8	35.5	17.3	36.0
		1100	25.2	9.3	24.3	13.5	23.3	17.7	22.2	22.0	21.7	26.0	21.1	32.5	20.5	38.0	20.0	40.0
		1200	28.0	9.8	27.0	15.0	25.9	19.5	25.0	24.3	24.5	31.5	23.9	35.0	23.2	42.5	22.7	47.0
		1300	30.7	10.4	29.7	16.5	28.6	21.2	27.7	26.7	27.2	33.3	26.7	37.0	26.0	46.0	25.5	50.0
		1400	33.4	11.0	32.4	17.9	31.3	23.0	30.5	29.0	30.0	35.2	29.5	40.0	28.7	49.5	28.2	53.0
		1500	36.2	11.6	35.2	18.9	34.1	24.8	33.3	31.3	32.8	37.0	32.3	43.0	31.5	52.0	31.0	56.0

- Menggunakan 1 diffuser tipe Max Air™ SS Coarse Bubble Diffuser dengan model 12" w/Deflector

Coarse Bubble Systems

MaxAir™ SS Coarse Bubble Diffuser

EDI MaxAir SS diffusers are stainless steel coarse bubble diffuser assemblies used for maximum mixing applications. Units offer superior coarse bubble distribution and maximum airhandling capacity with good oxygen transfer.

Diffusers are constructed of superior materials for long service life. Diffuser body is heavy gauge 316 SS sheet and is continuous welded to 316 SS cast inlet and ends.

MaxAir SS units can be applied in even the most demanding aeration/mixing applications including flow equalization, channel mix/aerate, and aerobic digester aeration/mixing applications.

The open bottom construction minimizes possible entrapment of solids in the unit when shut off providing superior longterm operation. If required EDI can supply the MaxAir units with an optional deflector installed.

MaxAir SS diffusers employ a 3/4-inch diameter NPT (male) threaded inlet for ease of installation and universal application. EDI offers 12-inch and 24-inch SS MaxAir Diffuser Units to meet your application needs.

MaxAir™ SS Coarse Bubble Diffuser

Specifications:

- Heavy duty 316 SS construction
- 3/4" male NPT nipple for connection
- Cast inlet and end cap
- Continuous welded construction
- Open bottom or closed bottom (with deflector) options



Part Number	Model	Design Airflow		Length	
		scfm	Nm³/hr	in	mm
00864	12" Open Bottom	0-30	0-48	12.4	315
00866	12" w/ Deflector	0-30	0-48	12.4	315
00865	24" Open Bottom	0-55	0-87	24.0	620
00867	24" w/ Deflector	0-55	0-87	24.0	620

Please contact Diffuser Express with technical questions regarding product selection.
1-877-EDI-AIR8 (334-2778) or 573-474-9456
email: sales@diffuserexpress.com

8

3. BAK PENGENDAP I (SEDIMENTASI)

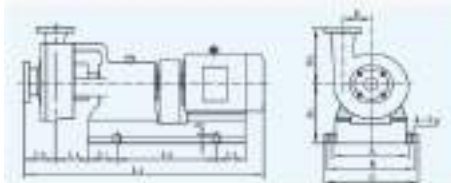
Menggunakan 1 unit pompa penguras lumpur dengan jenis cetrifugal slurry pump merk Shuangbao Machinery Co., Ltd UHB-ZK40/10-20 head pompa 22 m



Table 1: Light duty: 2P Motor Speed=2900RPM Design pressure: 1.6MPa ***Standard data

S/N	Model	Flow (m ³ /h)	Head (m)	Efficiency (%)	NPSHa (m)	Exlet's outlet (mm)	Motor Power (KW)	Pump and motor weight (kg)
1	UHB-ZK40/10-20	5	22	18	3.00	40*32	3.00	100.00
		*10	20	18				
		12	18	20				
2	UHB-ZK40/10-30	5	32	18	3.00	40*32	4.00	125.00
		*10	30	16				
		12	27	20				
3	UHB-ZK50/20-20	12	22	30	3.00	50*40	4.00	130.00
		*20	20	17				
		25	17	40				
4	UHB-ZK50/30-30	12	32	30	3.00	50*40	5.50	150.00
		*30	30	25.5				
		25	25	40				

Table 4: Light duty slurry pump installation drawing.



S/N	Model	Outline drawing and installation drawing												H	φ-Bd
		A	B	C	E	H1	H2	L1	L2	L3	L4	L5	L6		
1	UHB-ZK40/10-20	250	310	340	93	162	167	75	400	75	80	135	505	20	4-φ14
2	UHB-ZK40/10-30												520		

4. ACTIVATED SLUDGE

- Menggunakan 1 unit surface aerator SAR-340 dengan kapasitas transfer oksigen 38 kg/h



性能参数 Performance parameters

型号 Type	马达 Motor		曝气机 Aerator				
	功率 (hp)	转速 (r/min)	OC-HR (kg/h)	MD (m)	MZ (m)	D (m)	PR (m³/min)
SAR-32	2	1450	3.0	6	12	2~3	5
SAR-33	3	1450	4.2	9	18	3~4	7
SAR-35	5	1450	6.6	12	24	3~4	9
SAR-37	7 1/2	1450	9.6	16	32	3~4	11
SAR-310	10	1450	11.5	19	38	3~4	19
SAR-315	15	1450	16.5	27	54	3~4	24
SAR-320	20	1450	21.0	32	64	3~4	29
SAR-325	25	1450	27.5	36	72	3~4	33
SAR-330	30	1450	31.0	40	80	3~4	37
SAR-340	40	1450	38.0	45	90	5~6	46
SAR-350	50	1450	50	50	100	5~6	55
SAR-360	60	1450	61	56	112	5~6	65
SAR-375	75	1450	73	62.5	125	5~6	80
SAR-3100	100	1450	95	70	140	5~6	120

MZ: 混合区域之直径(m)
 OC-HR: 每小时传氧量(kg/h)
 MD: 最低平均速度(大约1.2米/秒)时的安全混合直径(m)
 D: 完全混合之深度, 和MD相关
 PR: 流量(m³/min)

MZ: Diameter of Mixing Zone. (m)
 OC-HR: Kgs Oxygenation Capacity per Hour. (kg/h)
 MD: Diameter of Complete Mixing in Meter at minimum average velocity of 1.2 meter per second (approx). (m)
 D: Depth in Meter of Complete Mixing, related to MD.
 PR: Pumping Rate, m³ per Minute.

Type	Dimensions(mm)							W(kg)
		B	C	D	E	F	H	
SAR-32	1200	250	200	120	360	100	900	85
SAR-33	1200	250	200	120	360	100	900	90
SAR-35	1500	300	320	140	420	100	1120	130
SAR-37	1500	360	320	280	430	110	1140	160
SAR-310	1500	360	320	280	480	110	1190	180
SAR-315	1800	500	600	300	580	120	1600	250
SAR-320	1800	500	600	300	630	120	1650	290
SAR-325	1800	500	600	300	650	120	1670	350
SAR-330	1800	500	600	300	700	120	1720	390
SAR-340	1800	650	800	340	730	150	2020	430
SAR-350	1800	650	800	340	750	150	2040	430
SAR-360	2200	800	800	340	820	200	2160	720
SAR-375	2200	800	800	370	860	200	2230	795
SAR-3100	2200	800	800	400	950	200	2350	1075

- Menggunakan 1 unit pompa resirkulasi slurry pump dari clarifier kembali ke bak activated sludge dengan merk Europrosper ITS Tipe FY (5FY32) head pompa 14 m



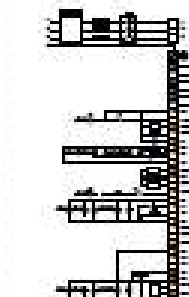
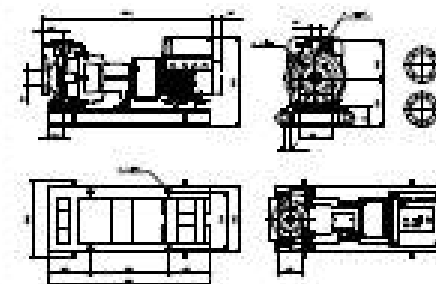
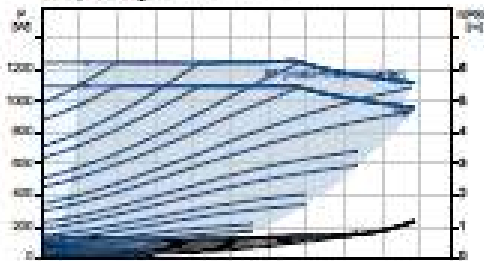
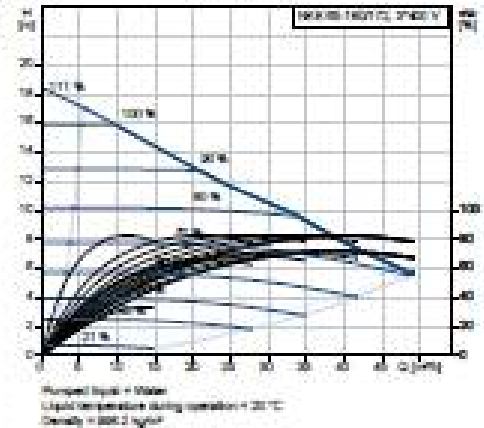
Pump type	Rotation speed n=950 [rpm]			Rotation speed n=1450 [rpm]			Weight m [kg]
	Capacity Q [m ³ /h]	Head H [m]	Motor rated power P _s [kW]	Capacity Q [m ³ /h]	Head H [m]	Motor rated power P _s [kW]	
5FY32	13	14	11	20	32	22	160
6FY32	33	14	15	50	32	30	170
6FY40	33	21	18,5	50	50	37	210
10FY32	66	14	11	100	32	37	180
10FY40	66	21	18,5	100	50	55	230
12FY40	131	21	30	200	50	90	280
12FY50	131	34	45	200	80	132	370
15FY50	262	34	75	400	80	200	430

- Menggunakan 1 unit pompa Grundfos menuju ke clarifier NKE 65 – 180/172 AA1F1S3ESBQQEGWA



Qty.	Description
1	NKE 65-160/172 AA1F1S3E8BQGEQWA  <i>Note! Product picture may differ from actual product</i> Product No.: On request Non-self-priming, single-stage, centrifugal pump designed according to ISO 5199 with dimensions and rated performance according to EN 733. Flanges are PN 10 with dimensions according to EN 1092-2. The pump has an axial suction port, a radial discharge port and horizontal shaft. It is of the back pull-out design enabling removal of the motor, coupling, bearing bracket and impeller without disturbing the pump housing or pipework. The unbalanced rubber bellows seal is according to DIN EN 12758. The pump is fitted with a foot-mounted, fan-cooled, permanent-magnet synchronous motor. Pump and motor are mounted on a common base frame. The motor includes a frequency converter and PI controller in the motor terminal box. This enables continuously variable control of the motor speed, which again enables adaptation of the performance to a given requirement. The product's minimum efficiency index (MEI) is greater or equal to 0.70. This is by the Commission Regulation (EU) considered as an indicative benchmark for best-performing water pump available on the market as from 1 January 2013. An external sensor can be connected if controlled pump operation is required for flow, differential pressure or temperature control. The operating panel on the motor terminal box features a four-inch TFT display, push-buttons and the Grundfos Eye indicator. The display gives an intuitive and user-friendly interface to all functions. The push-buttons are used to navigate through the menu structure to access pump and performance data on site and enable setting of required setpoint as well as setting of pump to "Min." or "Max." operation or to "Stop". The Grundfos Eye indicator on the operating panel provides visual indication of pump status: • "Power on": Motor is running (rotating green indicator lights) or not running (permanently green indicator lights) • "Warning": Motor is still running (rotating yellow indicator lights) or has stopped (permanently yellow indicator lights) • "Alarm": Motor has stopped (flashing red indicator lights). Communication with the pump is also possible by means of Grundfos GO Remote (accessory). The remote control enables further settings as well as reading out of a number of parameters such as "Actual value", "Speed", "Power input" and total "Power consumption". Pump and motor are mounted on a common steel base frame in accordance with ISO 3851. The back pull-out design makes it possible to service the pump when the pump housing is still connected to the inlet and discharge pipes. 1) Remove the bolts in the bearing bracket support foot and motor foot. 2) Remove the bearing bracket and the motor from the pump housing.  Pump The pump is fitted with an unbalanced rubber bellows seal with torque transmission across the spring and around the bellows. Due to the bellows, the seal does not wear the shaft, and the axial movement is not prevented by deposits on the shaft.

Description	Value
General information:	
Product name:	NKE 85-180/172 AA1F1S3E5BQGGGWA
Product No:	On request
EAN number:	On request
Technical:	
Pump speed on which pump data are based:	3000 rpm
Rated flow:	35.59 m³/h
Pump with motor (Yes/No):	Y
Rated head:	7.62 m
Actual impeller diameter:	172 mm
Nominal impeller diameter:	150
Shaft diameter:	18 mm
Code for shaft seal:	BQGE
Mechanical seal type:	Single
Curve tolerance:	ISO9906:2012 2B
Pump version:	A1
Bearing design:	Standard
Materials:	
Pump housing:	Cast iron
Pump housing:	EN 1561 EN-GJL-250
Pump housing:	ASTM A48-35
Impeller:	Stainless steel
Impeller:	EN 1.4308
Impeller:	ASTM A351 CF8
Internal pump house coating:	Painting
Material code:	S3
Code for rubber:	E
Shaft:	Steel
Shaft:	EN 1.0503/1.4301
Shaft:	AISI 1045/304
Installation:	
Range of ambient temperature:	-35 .. 50 °C
Maximum operating pressure:	10 bar
Pipe connection standard:	EN 1060-2
Type of inlet connection:	DIN
Type of outlet connection:	DIN
Size of inlet connection:	DN 80
Size of outlet connection:	DN 85
Pressure rating for connection:	PN 10
Coupling type:	Flexible w/o spacer
Base frame design:	C-channel
Code for base frame:	285
Grouting (Yes/No):	N
Connect code:	F
Liquid:	
Pumped liquid:	Water
Liquid temperature range:	-25 .. 120 °C
Selected liquid temperature:	20 °C
Density:	999.2 kg/m³
Electrical data:	
Motor type:	as050
Rated power - P2:	1.1 kW
Main frequency:	50 Hz
Rated voltage:	3 x 380-600 V
Rated current:	2.30-2.10 A
cos phi - power factor:	0.90-0.74





Company name:

Created by:

Phone:

Date:

31/05/2024

Description	Value
Rated speed:	180-2000 rpm
IE Efficiency class:	IE5
Motor efficiency at full load:	87.2 %
Number of poles:	4
Enclosure class (IEC 34-8):	IP55
Insulation class (IEC 88):	F
Built-in motor protection:	ELIC
Motor No.:	88005878
Bearing insulation type N-enc:	Steel bearing
Controls:	
Control panel:	HM300 - Graphical
Function Module:	FM300 - Advanced
Frequency converter:	Built-in
Pressure sensor:	N
Others:	
Minimum efficiency index, MEI 2:	0.70
Net weight:	88.1 kg
Gross weight:	106 kg
Shipping volume:	0.383 m³
Country of origin:	CN
Custom tariff no.:	84137042
Language on pump nameplate:	GB

5. BAK PENGENDAP II (CLARIFIER)

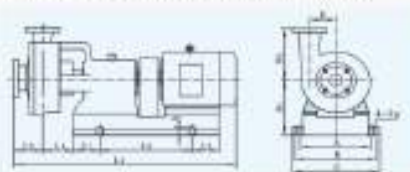
- Menggunakan 1 unit pompa penguras lumpur dengan jenis cetrifugal slurry pump merk Shuangbao Machinery Co., Ltd UHB-ZK40/10-20 head pompa 22 m



Table 1: Light duty: 2P Motor Speed=2900RPM Design pressure: 1.6MPa **Standard data

S/N	Model	Flow (m³/h)	Head (m)	Efficiency (%)	NPSHa (m)	Inlet x outlet (mm)	Motor Power (KW)	Pump and motor weight (kg)
1	UHB-ZK40/10-20	5	22	18	3.00	40*32	3.00	100.00
		*10	20	16				
		12	18	30				
2	UHB-ZK40/10-30	5	32	18	3.00	40*32	4.00	105.00
		*10	30	16				
		12	27	30				
3	UHB-ZK50/20-20	12	22	30	3.00	50*40	4.00	135.00
		*20	20	17				
		25	17	40				
4	UHB-ZK50/20-30	12	32	30	3.00	50*40	5.50	150.00
		*20	30	16.5				
		25	26	40				

Table 4: Light duty slurry pump installation drawing.



S/N	Model	Outline drawing and installation drawing													H	4-Bd
		A	B	C	E	H1	H2	L1	L2	L3	L4	L5	L6			
1	UHB-ZK40/10-20	230	210	140	99	162	167	19	400	70	80	135	005	20	4-B14	
2	UHB-ZK40/10-30												820			

- Menggunakan 1 unit motor penggerak untuk unit clarifier D-Series Dimensions

D-SERIES DIMENSIONS

Designed for large tanks with a center column and rake cage, the D-Series drives feature a large combination internal gear and precision ball bearing.



6. SLUDGE DRYING BED

Menggunakan 1 unit pompa resirkulasi slurry pump dari sludge drying bed kembali bak activated sludge dengan merk Europrosper ITS Tipe MF head pompa 5,5 – 65 m



Pump type	Rotation speed n=950 [rpm]			Rotation speed n=1450 [rpm]			Weight m [kg]
	Capacity Q [m ³ /h]	Head H [m]	Motor rated power P _s [kW]	Capacity Q [m ³ /h]	Head H [m]	Motor rated power P _s [kW]	
5FY32	13	14	11	20	32	22	160
6FY32	33	14	15	50	32	30	170
6FY40	33	21	18,5	50	50	37	210
10FY32	66	14	11	100	32	37	180
10FY40	66	21	18,5	100	50	55	230
12FY40	131	21	30	200	50	90	280
12FY50	131	34	45	200	80	132	370
15FY50	262	34	75	400	80	200	430

7. PIPA PVC – RUCIKA BANGUNAN PENGOLAHAN AIR BUANGAN

Jenjang Produk

Pipa **Rucika Standard** diklasifikasikan menjadi 2 (dua) kelompok :

1. Kelas AW, untuk air bertekanan tinggi sampai tekanan kerja 10 bar dengan 14 macam ukuran diameter dari 1/2 inch sampai 12 inch.
2. Kelas D, untuk saluran pembuangan dan limbah dengan 11 macam ukuran diameter dari 1-1/4 inch sampai 12 inch.

Kedua kelompok tersebut tersedia dalam panjang standar sampai 4 meter.

KELAS AW

Diameter		Tebal Dinding (mm)	Panjang (meter)	Sistem Penyambungan
inch	mm			
1/2	22	1,50	4	SC
3/4	25	1,80	4	SC
1	32	2,00	4	SC
1 1/4	42	2,30	4	SC
1 1/2	48	2,30	4	SC
2	60	2,30	4	SC
2 1/2	75	2,60	4	SC
3	89	3,10	4	SC
4	114	4,10	4	SC
5	140	5,40	4	SC
6	165	6,40	4	SC
8	216	8,30	4	SC
10	267	10,30	4	SC
12	318	12,20	4	SC

KELAS D

Diameter		Tebal Dinding (mm)	Panjang (meter)	Sistem Penyambungan
inch	mm			
1 1/4	42	1,30	4	SC
1 1/2	48	1,30	4	SC
2	60	1,30	4	SC
2 1/2	75	1,40	4	SC
3	89	1,80	4	SC
4	114	2,00	4	SC
5	140	2,60	4	SC
6	165	3,00	4	SC
8	216	4,20	4	SC
10	267	5,20	4	SC
12	318	6,20	4	SC

SC: Solvent Cement (penyambungan dengan lem)

8. PIPA SDR-41 – RUCIKA BANGUNAN PENGOLAHAN AIR BUANGAN

Jenjang Produk



Jenis	Diameter		Tebal Dinding	Panjang Efektif
	inch	mm	(mm)	(m)
Type A	3	80	1.8	8
Type B	3	80	3.2	6
SDR 41	4	110	3.2	6
	6	160	4.0	6
	8	200	4.9	6
	10	250	6.2	6
	12	315	7.7	6
	18	400	9.8	6
	20	500	12.3	6
24	630	15.4	6	

Selain menawarkan pipa dalam berbagai ukuran, **RUCIKA LITE** juga menyediakan koleksi lengkap aksesoris dan fitting *injector* sehingga memberikan ruang gerak yang leluasa dalam merancang sistem pembuangan yang terpadu.

Standar Kualitas

Mengacu pada standar :

- ISO 4435:1991 : *Plastics piping systems for non-pressure underground drainage and sewerage - Unplasticized Poly Vinyl Chloride (u-PVC).*
- SNI 06-0162-1987 : Pipa PVC untuk saluran air buangan di dalam dan di luar bangunan.
- SNI 06-0178-1987 : Sambungan pipa PVC untuk saluran air buangan di luar dan di dalam bangunan.

Physical Properties

Specific gravity	= 1.40 g/cm ³
Coefficient of linear expansion	= 8×10^{-5} mm/m.°C
Thermal conductivity	= 0.15 W/m.°C
Modulus of elasticity	= 3000 N/mm ²
Surface resistance	> 10 ¹² Ohm

Karakteristik Bahan

RUCIKA LITE terbuat dari uPVC yang bersifat *thermoplastic*, tidak korosif, tidak larut dalam air, isolator yang baik, kuat dan ringan.

Aplikasi Sistem

RUCIKA LITE digunakan sebagai sistem perpipaan bawah tanah untuk jaringan pembuangan dan air hujan, yang cocok untuk daerah rumah tinggal, komersial, dan industri.

LAMPIRAN B

GAMBAR DETAIL UNIT PENGOLAHAN AIR LIMBAH RUMAH SAKIT



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JENIS TUGAS

TUGAS PERACANGAN BANGUNAN
PENGOLAHAN AIR MINUM

DOSEN PENGAMPU

TUGAS PERACANGAN BANGUNAN
PENGOLAHAN AIR MINUM

DOSEN PEMBIMBING

TUGAS PERACANGAN BANGUNAN
PENGOLAHAN AIR MINUM

MAHASISWA

NPM

HASNA AQILAH P. A.
INTAN LAILI N. K.

21034010008
21034010016

GAMBAR

SKALA

1:230

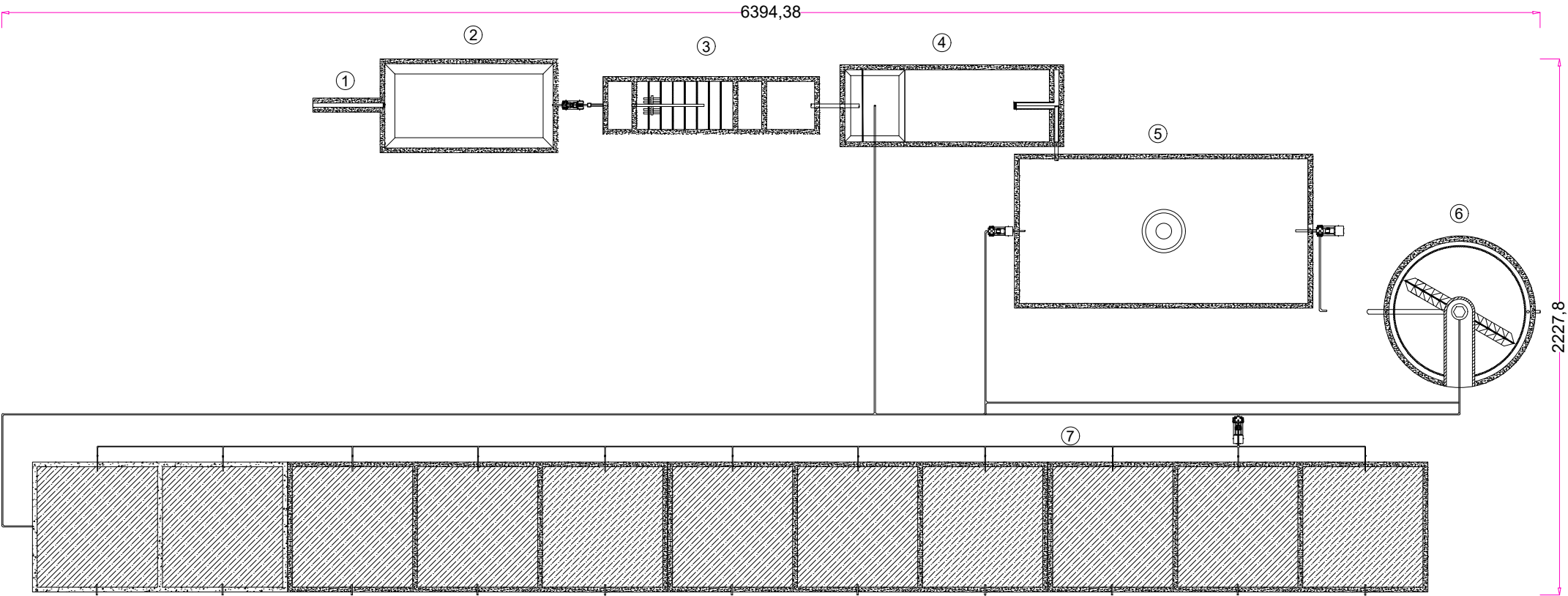
SATUAN

CENTIMETER

NOMOR GAMBAR

8

KETERANGAN



1. SALURAN PEMBAWA
2. BAK PENAMPUNG
3. DISSOLVED AIR FLOTATION
4. BAK PENGENDAP I (SEDIMENTASI)
5. ACTIVATED SLUDGE
6. BAK PENGENDAP II (CLARIFIER)
7. SLUDGE DRYING BED



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JENIS TUGAS

TUGAS PERANCANGAN BANGUNAN
PENGOLAHAN AIR BUANGAN

DOSEN PENGAMPU

FIRRA ROSARIAWARI, S.T., M.T.

DOSEN PEMBIMBING

AUSSIE AMALIA, ST., M.Sc.

MAHASISWA

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INTAN LAILI N. K.

NPM

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GAMBAR

UNIT SALURAN
PEMBAWA PENGOLAHAN
AIR BUANGAN

SKALA

1:40

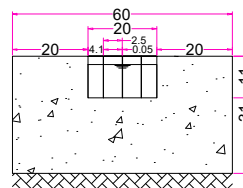
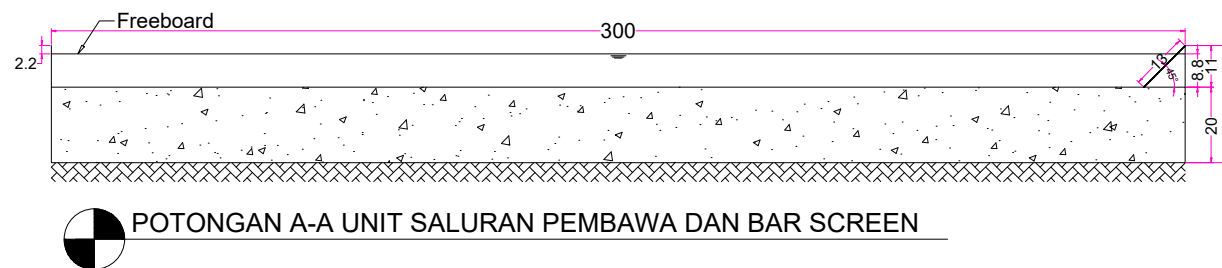
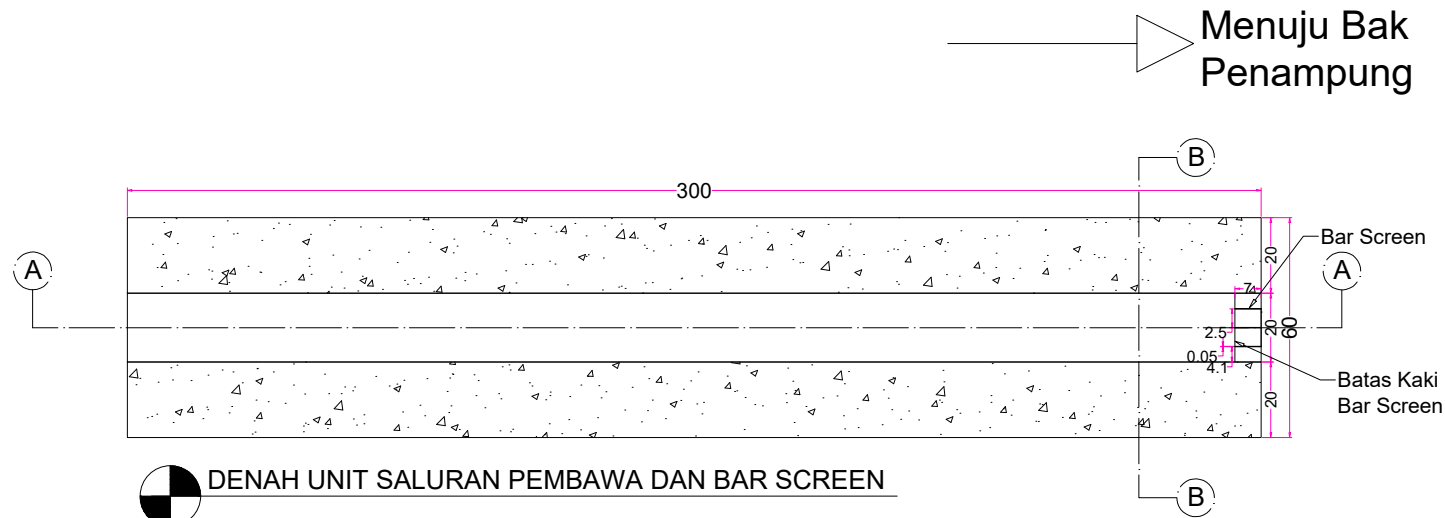
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CENTIMETER

NOMOR GAMBAR

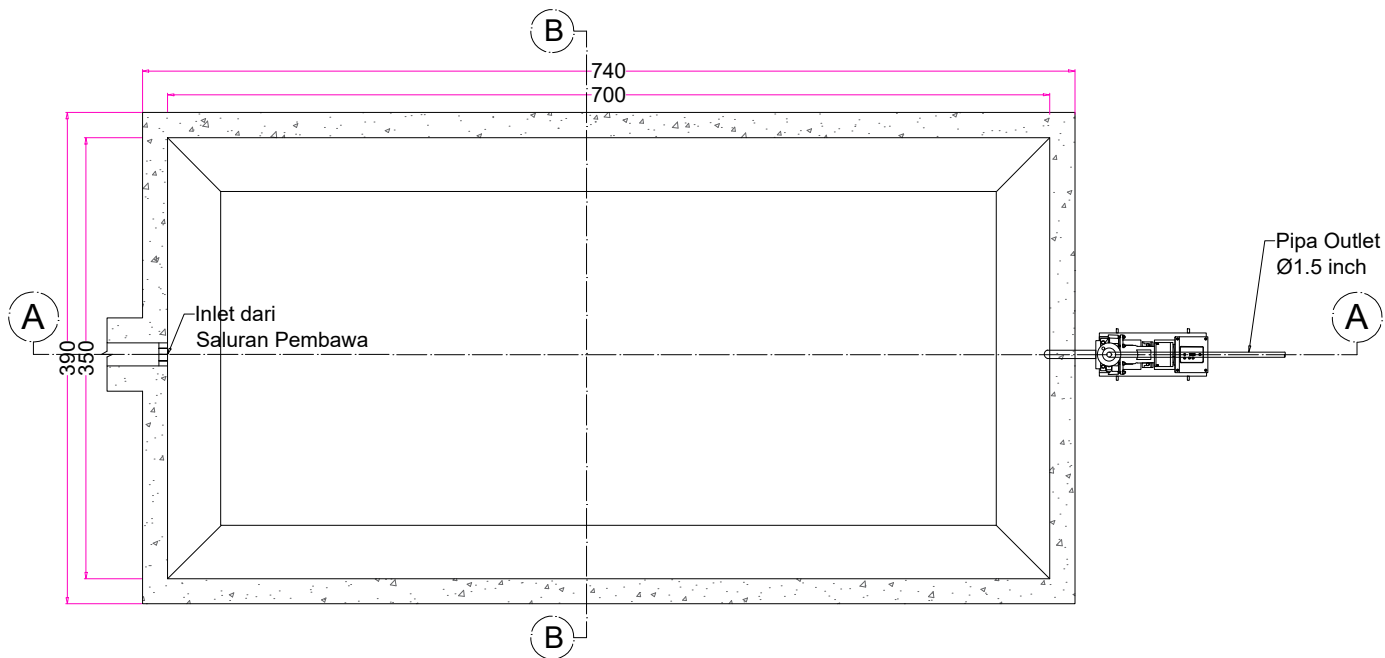
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KETERANGAN



→ Dari Saluran Pembawa
& Bar Screen

→ Menuju Dissolved
Air Flotation



 **DENAH UNIT BAK PENAMPUNG**
SKALA 1:60



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JENIS TUGAS

TUGAS PERANCANGAN BANGUNAN
PENGOLAHAN AIR BUANGAN

DOSEN PENGAMPU

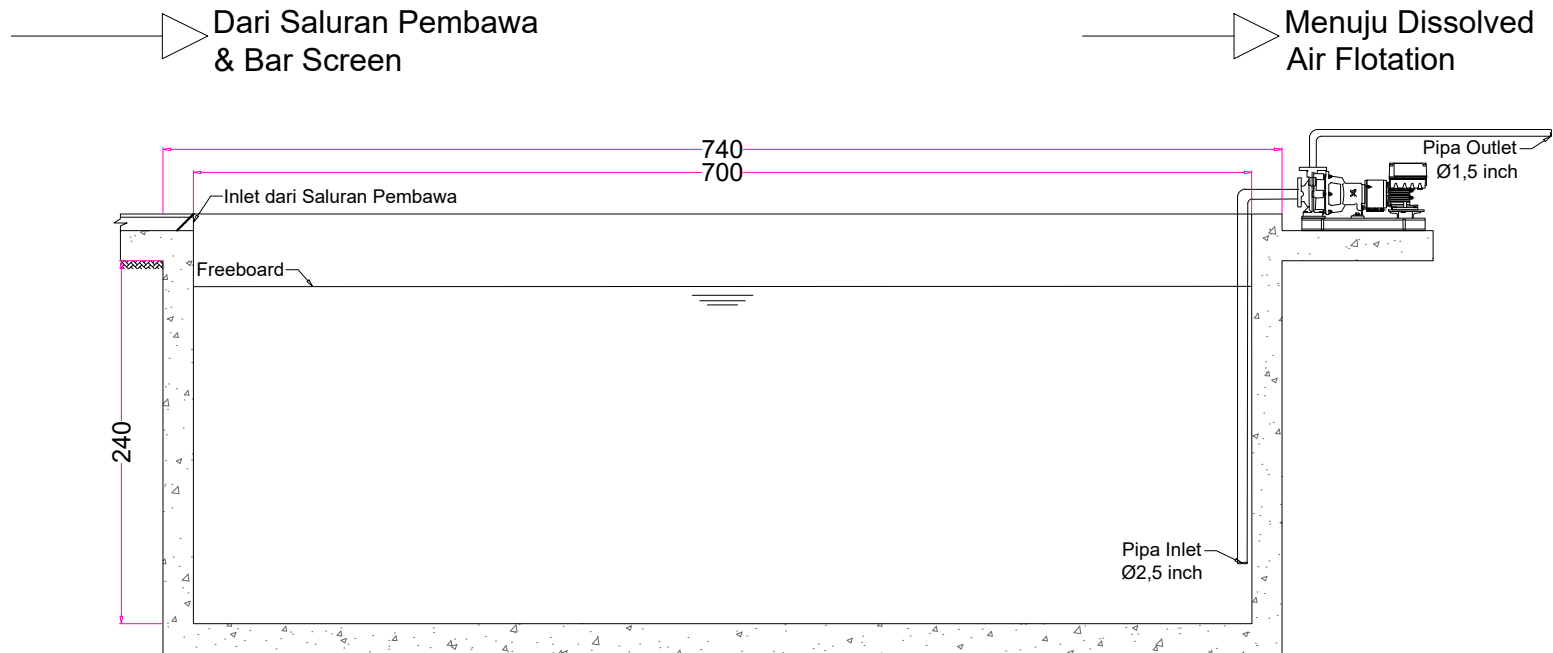
FIRRA ROSARIAWARI, S.T., M.T.

DOSEN PEMBIMBING

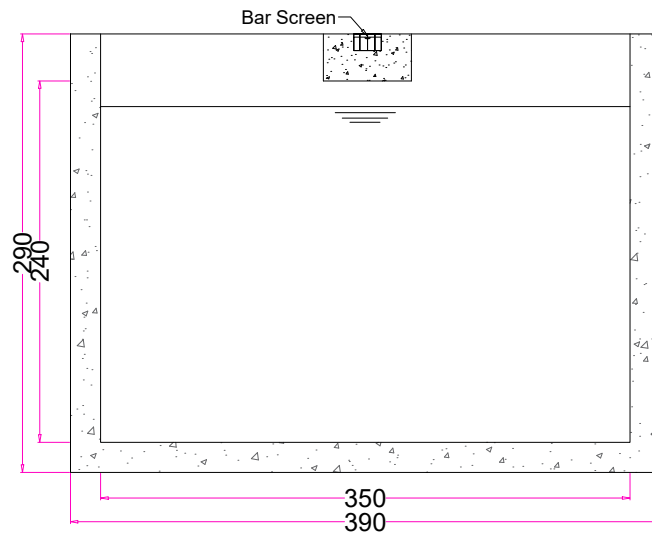
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MAHASISWA	NPM
HASNA AQILAH P. A.	21034010008
INTAN LAILI N. K.	21034010016
GAMBAR	SKALA
DENAH UNIT BAK TRANSISI PENGOLAHAN AIR MINUM	1:60
	SATUAN
	CENTIMETER
	NOMOR GAMBAR
	2

KETERANGAN



 **POTONGAN A-A UNIT BAK PENAMPUNG**



 **POTONGAN B-B UNIT BAK PENAMPUNG**



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JENIS TUGAS

TUGAS PERANCANGAN BANGUNAN
PENGOLAHAN AIR BUANGAN

DOSEN PENGAMPU

FIRRA ROSARIAWARI, S.T., M.T.

DOSEN PEMBIMBING

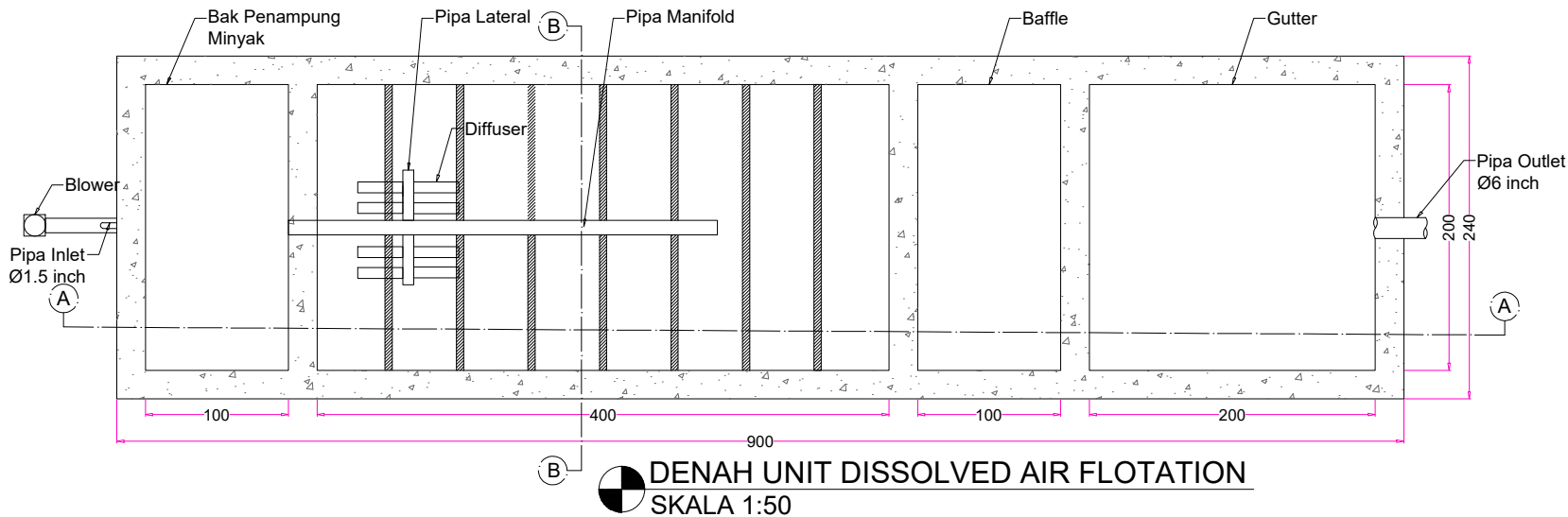
AUSSIE AMALIA, ST., M.Sc.

MAHASISWA	NPM
HASNA AQILAH P. A. INTAN LAILI N. K.	21034010008 21034010016
GAMBAR	SKALA
POTONGAN UNIT BAK PENAMPUNG PENGOLAHAN AIR BUANGAN	1:50
	SATUAN
	CENTIMETER
	NOMOR GAMBAR
	3

KETERANGAN

➤ Dari Bak Penampung

➤ Menuju Activated
Sludge



DENAH UNIT DISSOLVED AIR FLOTATION
SKALA 1:50



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JENIS TUGAS

TUGAS PERANCANGAN BANGUNAN
PENGOLAHAN AIR BUANGAN

DOSEN PENGAMPU

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DOSEN PEMBIMBING

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GAMBAR

DENAH UNIT DISSOLVED
AIR FLOTATION
PENGOLAHAN AIR
BUANGAN

SKALA

1:50

SATUAN

CENTIMETER

NOMOR GAMBAR

4

KETERANGAN



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JENIS TUGAS

TUGAS PERANCANGAN BANGUNAN
PENGOLAHAN AIR BUANGAN

DOSEN PENGAMPU

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DOSEN PEMBIMBING

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GAMBAR

POTONGAN UNIT
DISSOLVED AIR
FLOTATION
PENGOLAHAN AIR
BUANGAN

SKALA

1:60

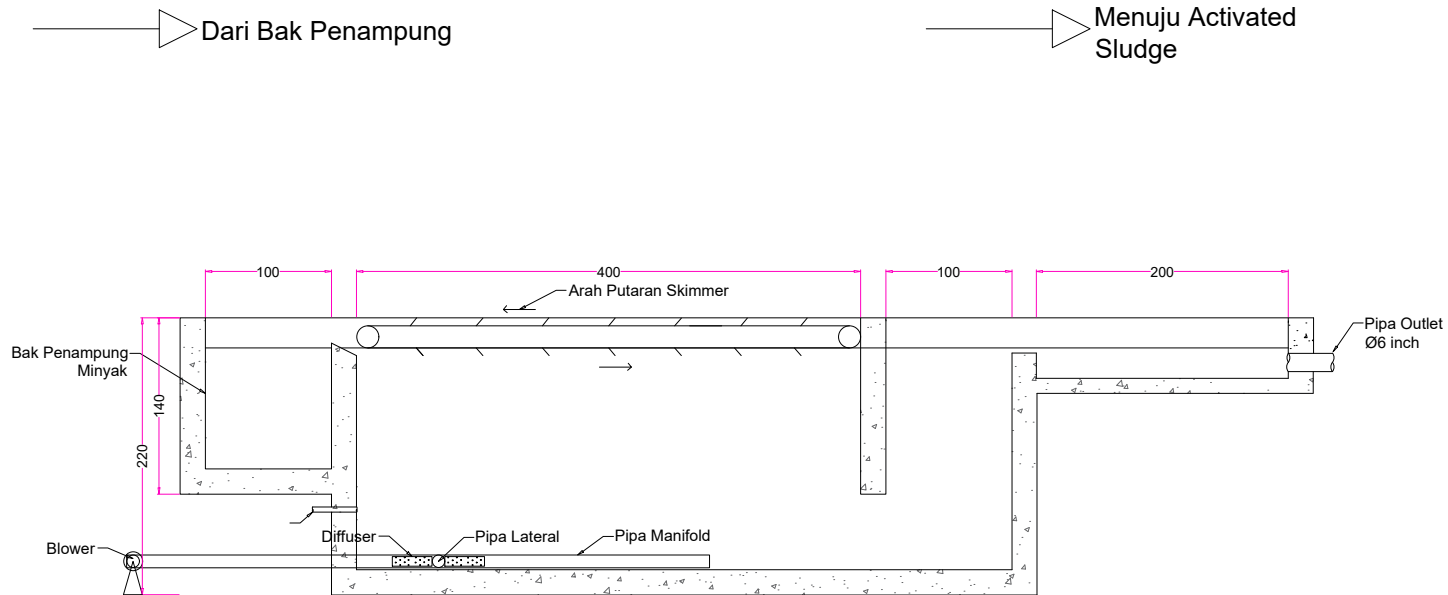
SATUAN

CENTIMETER

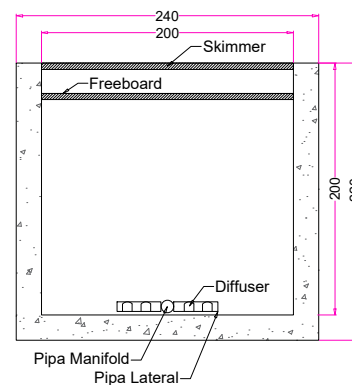
NOMOR GAMBAR

5

KETERANGAN



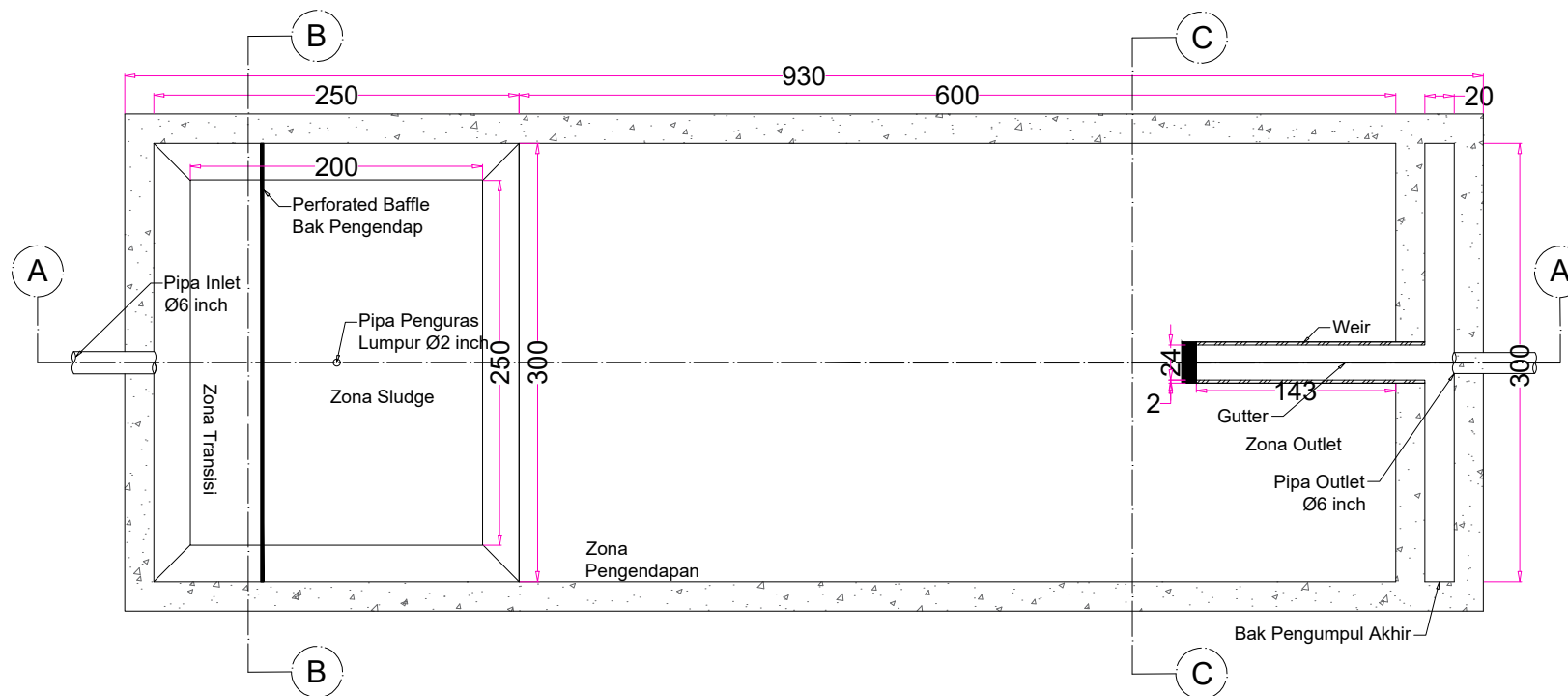
POTONGAN A-A UNIT DISSOLVED AIR FLOTATION



POTONGAN A-A UNIT DISSOLVED AIR FLOTATION

→ Dari Dissolved Air Flotation

→ Menuju Bak Pengendap I (Sedimentasi)



 **DENAH UNIT BAK PENGENDAP I (SEDIMENTASI)**
SKALA 1:50



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JENIS TUGAS

TUGAS PERANCANGAN BANGUNAN
PENGOLAHAN AIR BUANGAN

DOSEN PENGAMPU

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DOSEN PEMBIMBING

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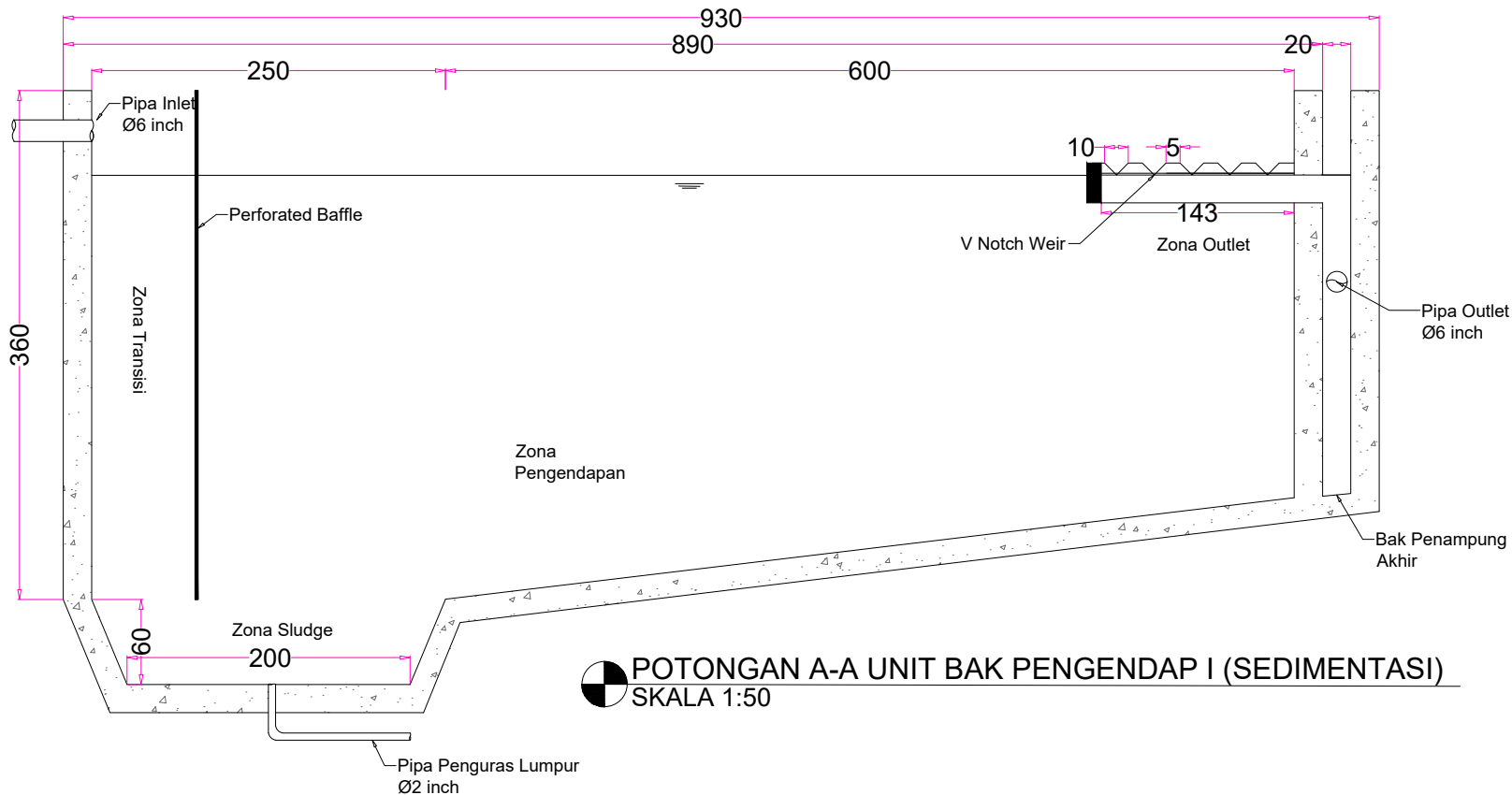
MAHASISWA	NPM
HASNA AQILAH P. A.	21034010008
INTAN LAILI N. K.	21034010016

GAMBAR	SKALA
DENAH UNIT BAK PENGENDAP I (SEDIMENTASI) PENGOLAHAN AIR BUANGAN	1:50
	SATUAN
	CENTIMETER
	NOMOR GAMBAR
	6

KETERANGAN

→ Dari Dissolved Air Flotation

→ Menuju Bak Pengendap I (Sedimentasi)



POTONGAN A-A UNIT BAK PENGENDAP I (SEDIMENTASI)
SKALA 1:50



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JENIS TUGAS

TUGAS PERANCANGAN BANGUNAN
PENGOLAHAN AIR BUANGAN

DOSEN PENGAMPU

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DOSEN PEMBIMBING

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POTONGAN UNIT BAK
PENGENDAP I
(SEDIMENTASI)
PENGOLAHAN AIR
BUANGAN

SKALA

1:50

SATUAN

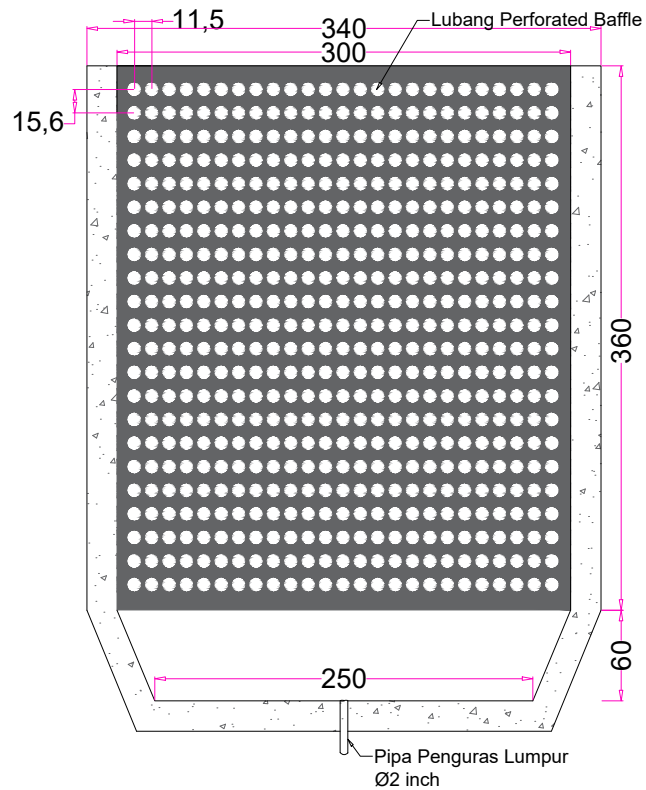
CENTIMETER

NOMOR GAMBAR

7

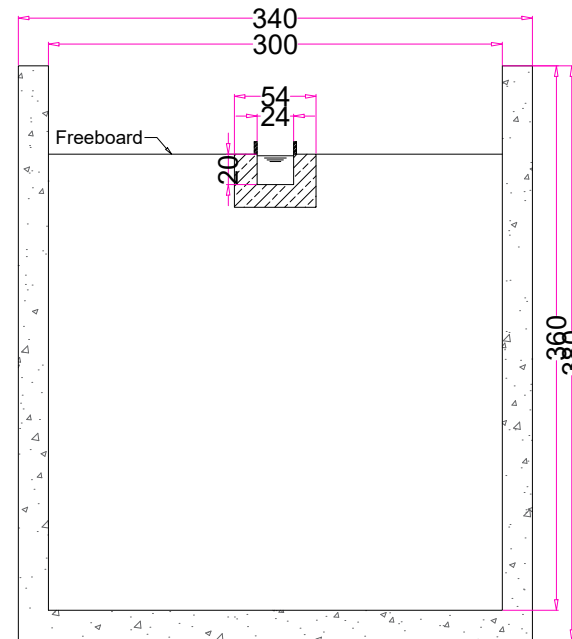
KETERANGAN

→ Dari Dissolved Air Flotation



 **POTONGAN B-B UNIT BAK PENGENDAP I (SEDIMENTASI)**

→ Menuju Bak Pengendap I (Sedimentasi)



 **POTONGAN C-C UNIT BAK PENGENDAP I (SEDIMENTASI)**



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JENIS TUGAS

TUGAS PERANCANGAN BANGUNAN
PENGOLAHAN AIR BUANGAN

DOSEN PENGAMPU

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POTONGAN UNIT BAK
PENGENDAP I
(SEDIMENTASI)
PENGOLAHAN AIR
BUANGAN

SKALA

1:50

SATUAN

CENTIMETER

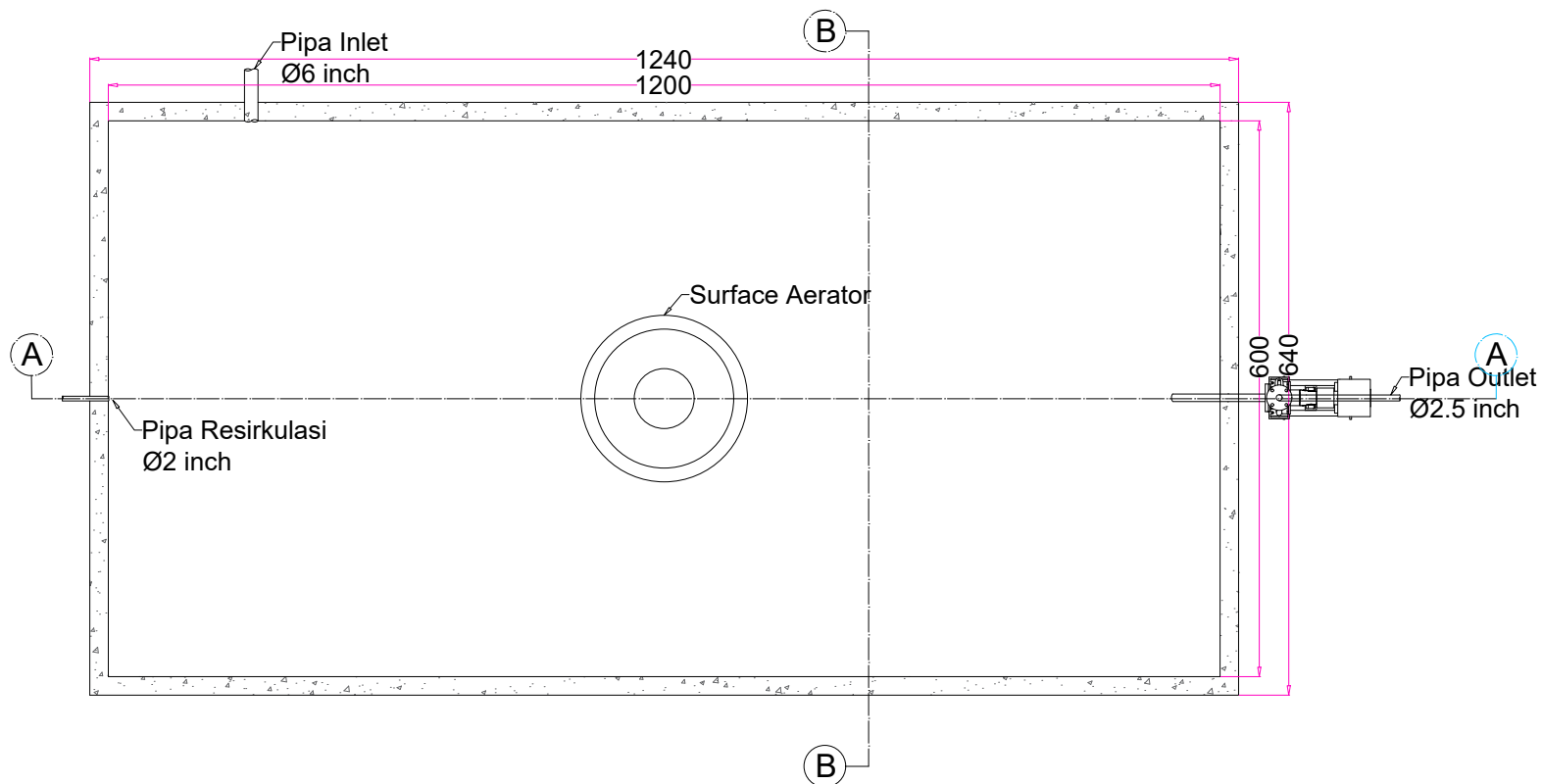
NOMOR GAMBAR

8

KETERANGAN

→ Dari Bak Pengendap I
(Sedimentasi)

→ Menuju Bak Pengendap II
(Clarifier)



DENAH UNIT ACTIVATED SLUDGE
SKALA 1:80



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JENIS TUGAS

TUGAS PERANCANGAN BANGUNAN
PENGOLAHAN AIR BUANGAN

DOSEN PENGAMPU

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DOSEN PEMBIMBING

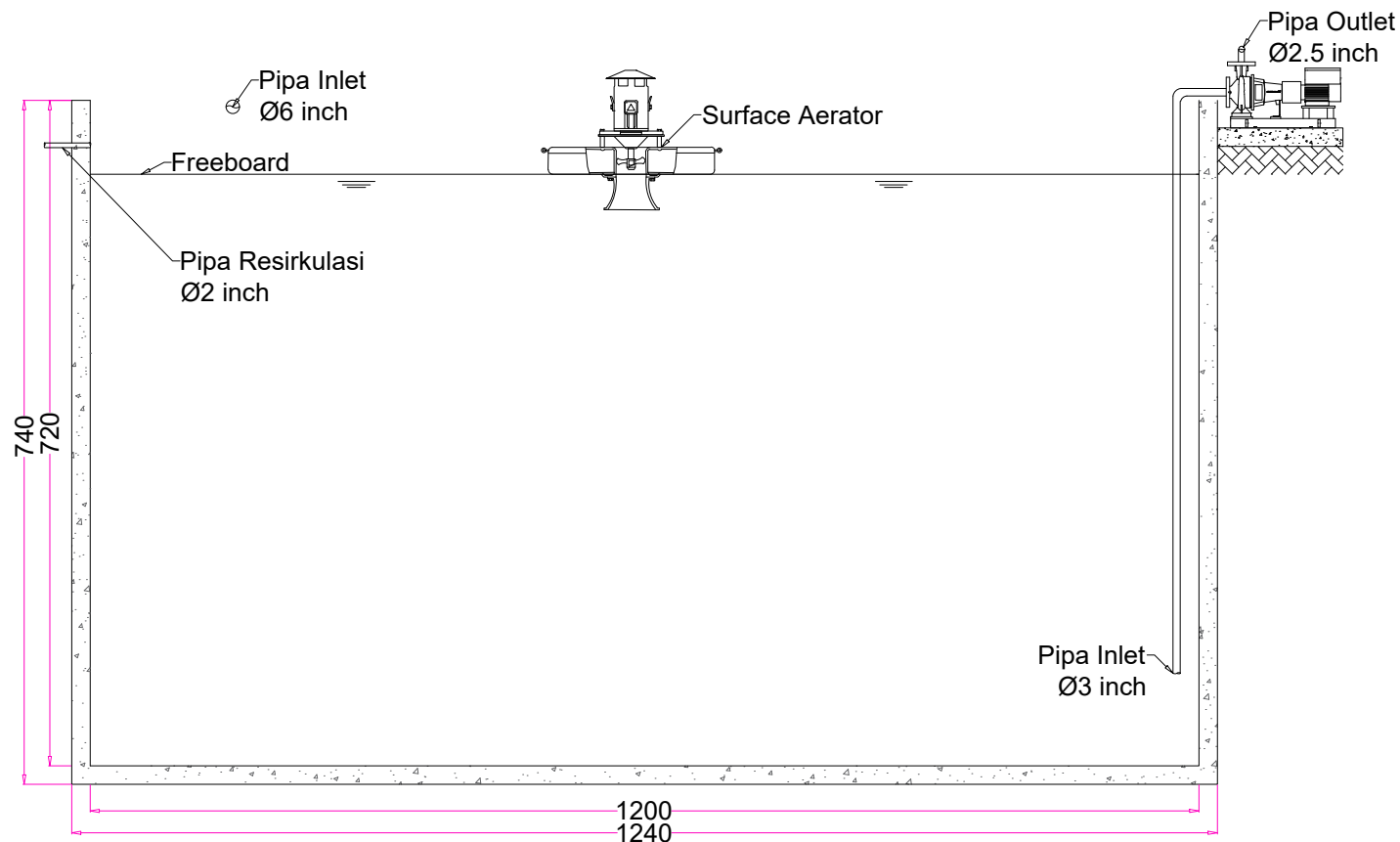
AUSSIE AMALIA, ST., M.Sc.

MAHASISWA	NPM
HASNA AQILAH P. A. INTAN LAILI N. K.	21034010008 21034010016
GAMBAR	SKALA
DENAH UNIT ACTIVATED SLUDGE PENGOLAHAN AIR BUANGAN	1:80
	SATUAN
	CENTIMETER
	NOMOR GAMBAR
	9

KETERANGAN

→ Dari Bak Pengendap I
(Sedimentasi)

→ Menuju Bak Pengendap
II (Clarifier)



 **POTONGAN A-A UNIT ACTIVATED SLUDGE**
SKALA 1:80



PROGRAM STUDI TEKNIK LINGKUNGAN
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"VETERAN" JAWA TIMUR

JENIS TUGAS

TUGAS PERANCANGAN BANGUNAN
PENGOLAHAN AIR BUANGAN

DOSEN PENGAMPU

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DOSEN PEMBIMBING

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NPM

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GAMBAR

POTONGAN UNIT
ACTIVATED SLUDGE
PENGOLAHAN AIR
BUANGAN

SKALA

1:80

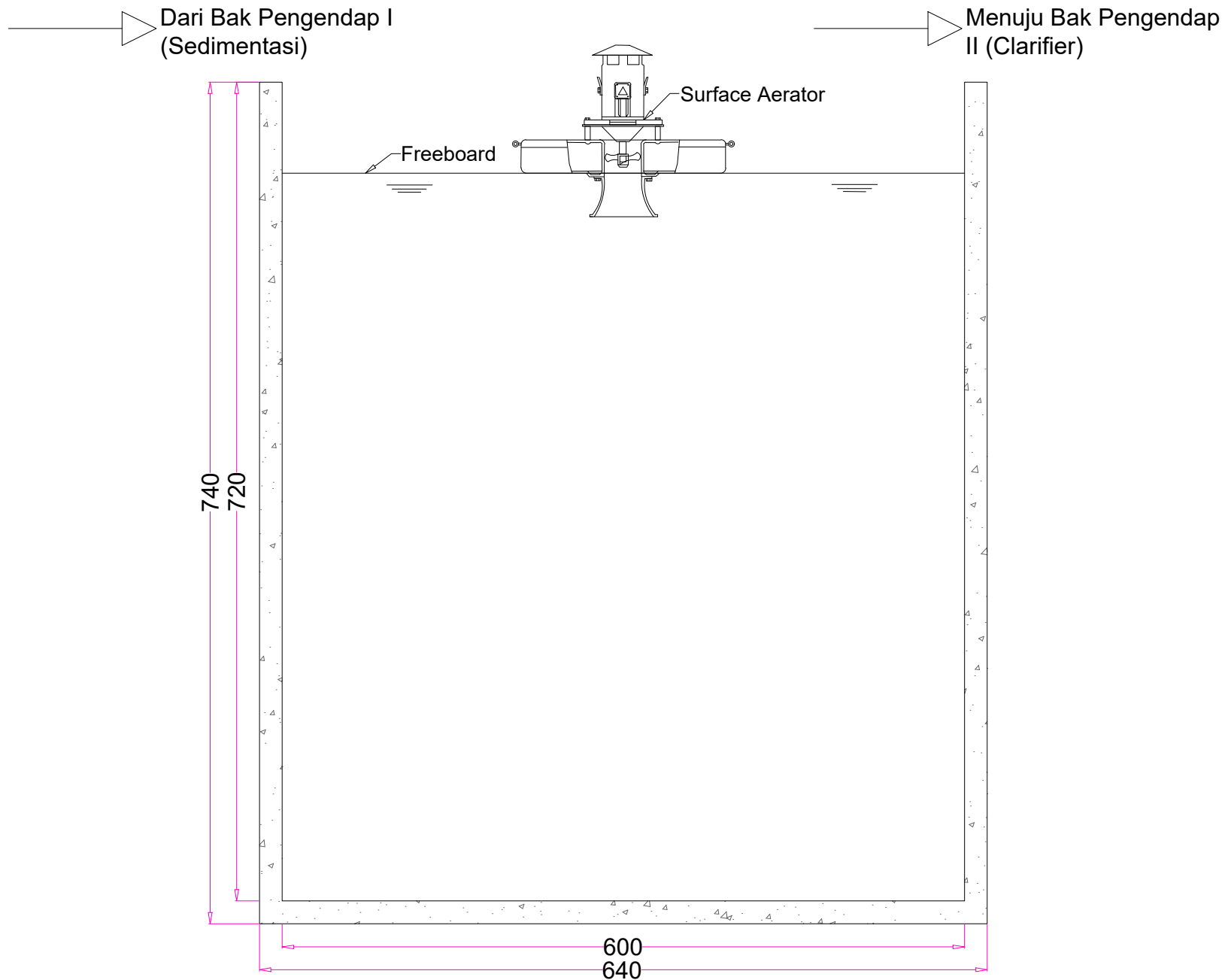
SATUAN

CENTIMETER

NOMOR GAMBAR

10

KETERANGAN



POTONGAN B-B UNIT ACTIVATED SLUDGE
SKALA 1:50



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

JENIS TUGAS

TUGAS PERANCANGAN BANGUNAN
PENGOLAHAN AIR BUANGAN

DOSEN PENGAMPU

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DOSEN PEMBIMBING

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INTAN LAILI N. K.

NPM

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21034010016

GAMBAR

POTONGAN UNIT
ACTIVATED SLUDGE
PENGOLAHAN AIR
BUANGAN

SKALA

1:50

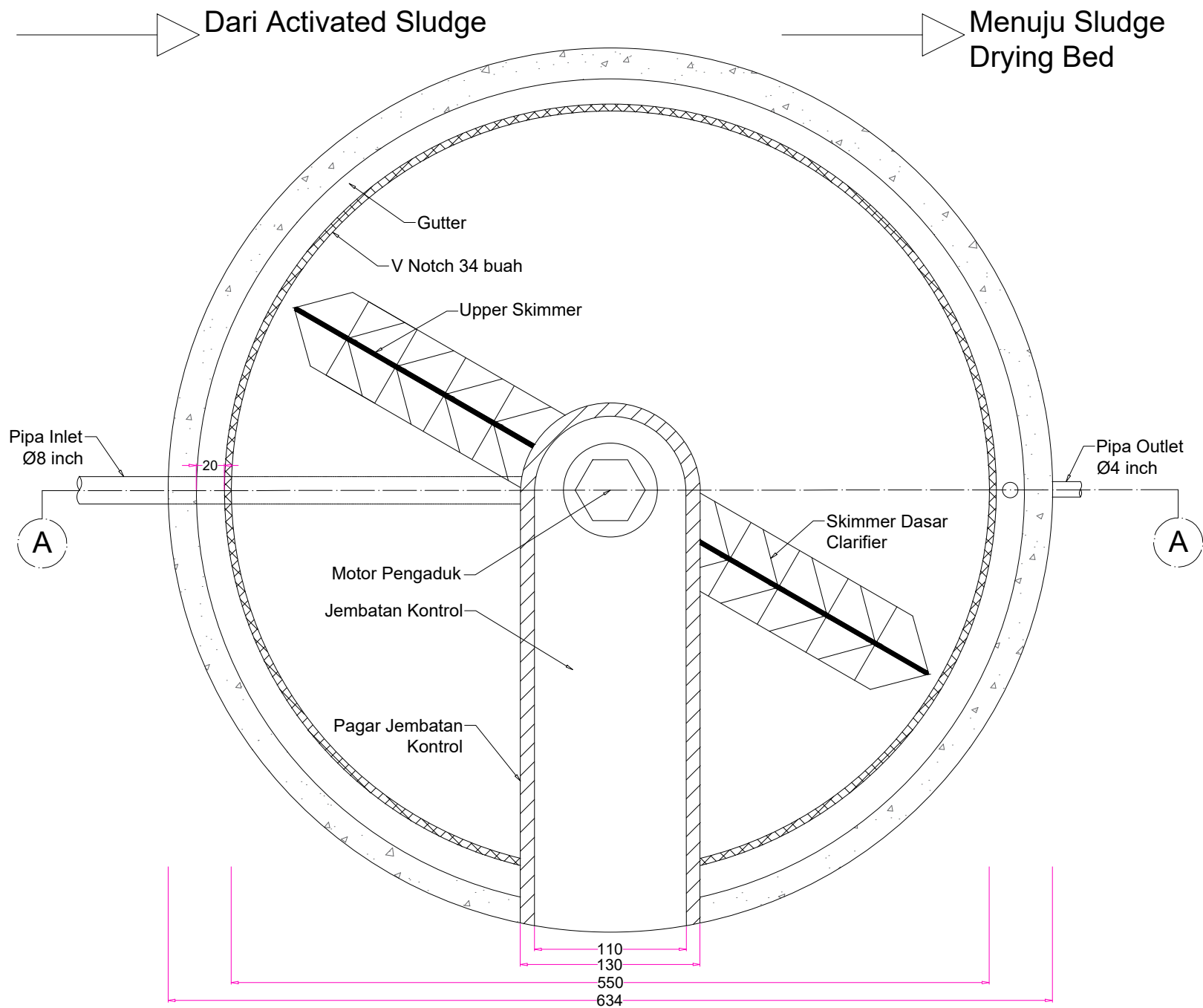
SATUAN

CENTIMETER

NOMOR GAMBAR

11

KETERANGAN



 **DENAH UNIT BAK PENGENDAP II (CLARIFIER)**
SKALA 1:40



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"VETERAN" JAWA TIMUR

JENIS TUGAS

TUGAS PERANCANGAN BANGUNAN
PENGOLAHAN AIR BUANGAN

DOSEN PENGAMPU

FIRRA ROSARIAWARI, S.T., M.T.

DOSEN PEMBIMBING

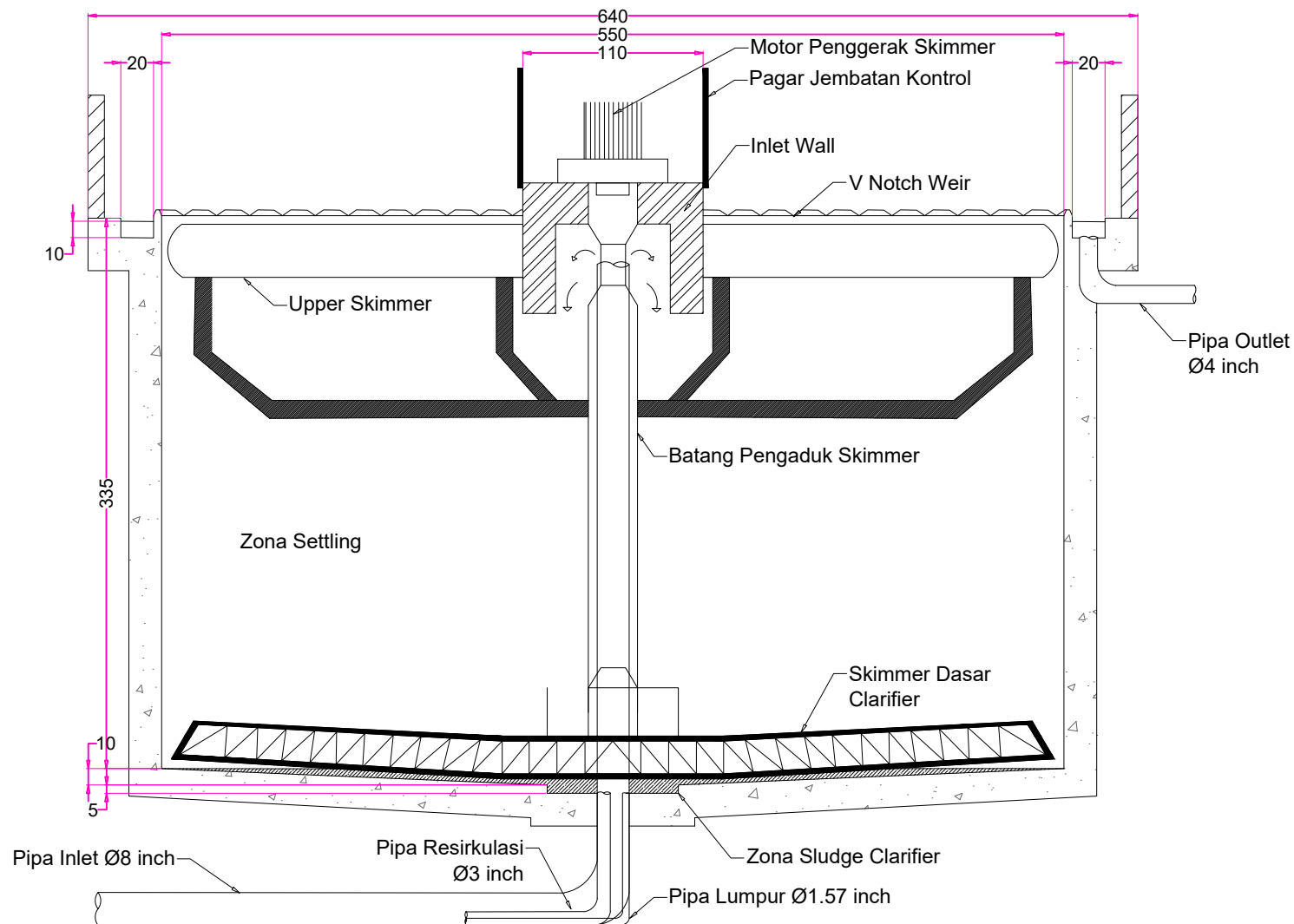
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MAHASISWA	NPM
HASNA AQILAH P. A.	21034010008
INTAN LAILI N. K.	21034010016

GAMBAR	SKALA
DENAH UNIT BAK PENGENDAP II (CLARIFIER) PENGOLAHAN AIR BUANGAN	1:40
	SATUAN
	CENTIMETER
	NOMOR GAMBAR
	12

KETERANGAN

→ Dari Activated Sludge
→ Menuju Sludge Drying Bed




POTONGAN A-A UNIT BAK PENGENDAP II (CLARIFIER)
 SKALA 1:40



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

JENIS TUGAS

TUGAS PERANCANGAN BANGUNAN
 PENGOLAHAN AIR BUANGAN

DOSEN PENGAMPU

FIRRA ROSARIAWARI, S.T., M.T.

DOSEN PEMBIMBING

AUSSIE AMALIA, ST., M.Sc.

MAHASISWA

HASNA AQILAH P. A.
 INTAN LAILI N. K.

NPM

21034010008
 21034010016

GAMBAR

POTONGAN UNIT BAK
 PENGENDAP II
 (CLARIFIER)
 PENGOLAHAN AIR
 BUANGAN

SKALA

1:40

SATUAN

CENTIMETER

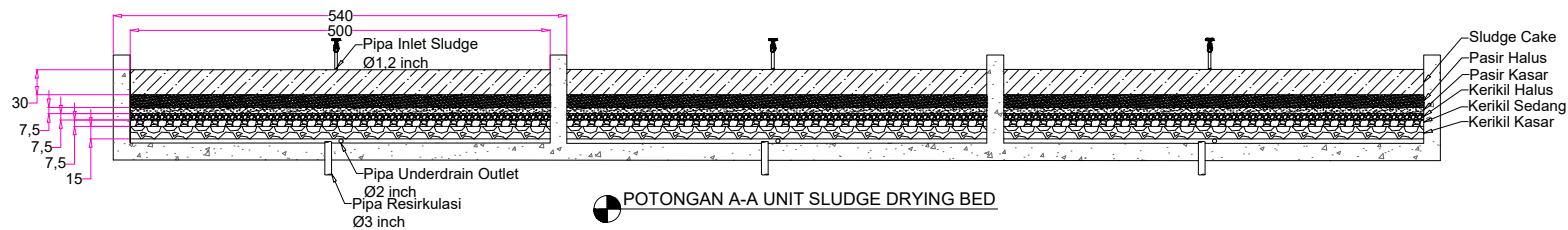
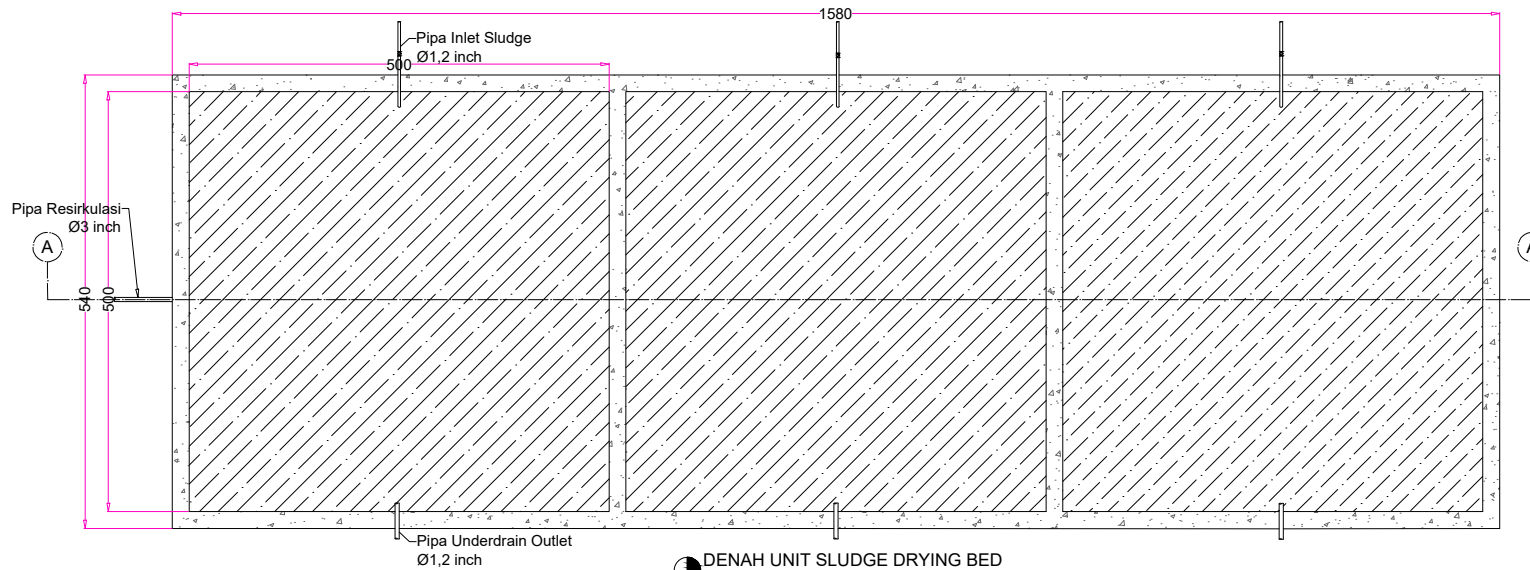
NOMOR GAMBAR

13

KETERANGAN

➤ Dari Sedimentasi & Clarifier

➤ Menuju Badan Air



PROGRAM STUDI TEKNIK LINGKUNGAN
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MAHASISWA	NPM
HASNA AQILAH P. A. INTAN LAILI N. K.	21034010008 21034010016
GAMBAR	SKALA
UNIT SLUDGE DRYING BED PENGOLAHAN AIR BUANGAN	1:90
	SATUAN
	CENTIMETER
	NOMOR GAMBAR
	14

KETERANGAN



PROGRAM TEKNIK LINGKUNGAN
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PENGOLAHAN AIR BUANGAN

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DOSEN PEMBIMBING

AUSSIE AMALIA, S.T., M.Sc.

MAHASISWA

NPM

HASNA AQILAH P. A.
INTAN LAILI N. K.

21034010008
21034010016

GAMBAR

SKALA

1:180

PROFIL HIDROLIS UNIT
PENGOLAHAN AIR
BUANGAN

SATUAN

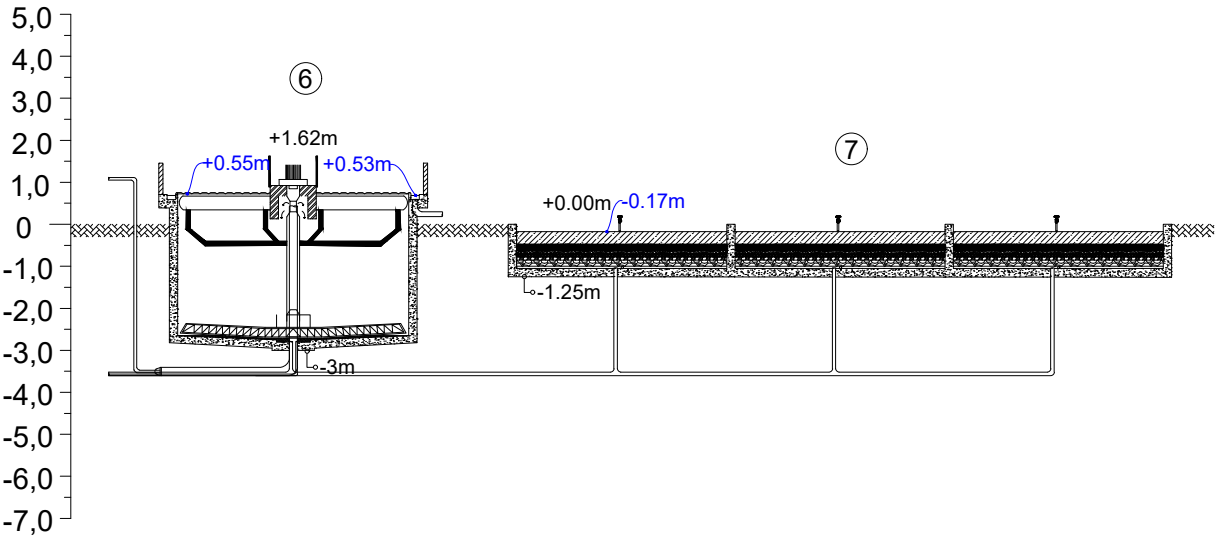
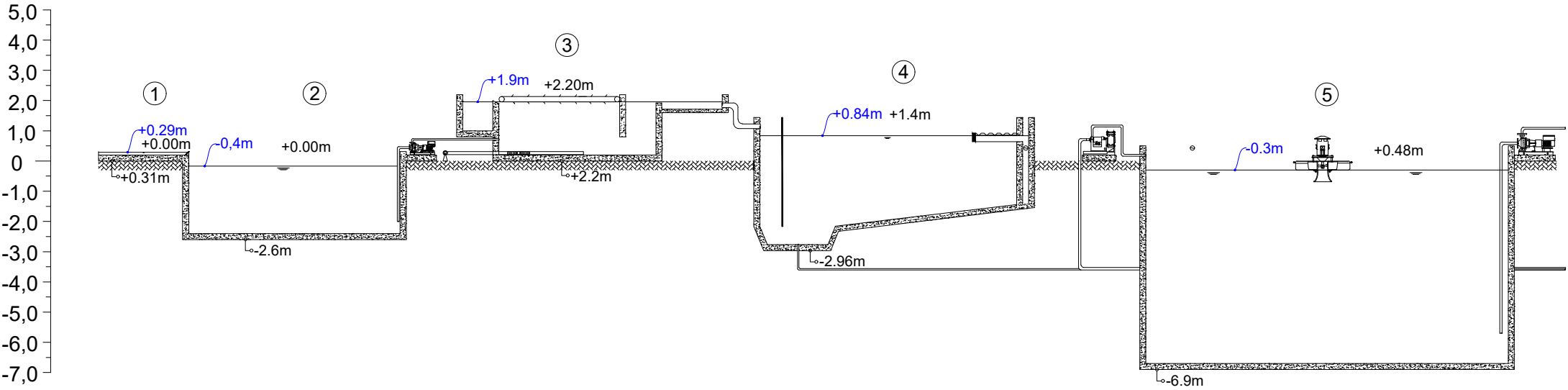
CENTIMETER

NOMOR GAMBAR

17

KETERANGAN

- PIPA ALIRAN AIR
- PIPA ALIRAN SLUDGE
- PIPA RESIRKULASI



1. SALURAN PEMBAWA
2. BAK PENAMPUNG
3. DISSOLVED AIR FLOTATION
4. BAK PENGENDAP I (SEDIMENTASI)
5. ACTIVATED SLUDGE
6. BAK PENGENDAP II (CLARIFIER)
7. SLUDGE DRYING BED