

ELECTRIC POWER SUPPLY

Pumping house

The aim of this project is to provide for power supply to pumping house in village Enish-2 in Sayat смех (vel. Lebap).

By the degree of reliability and continuity of power supply the projected facility belongs to the consumer of the III category. The project provides for connecting the pump from the existing complete transformer.

In this project a cable version of 0.4 kV indoor networks is adopted. Cable lines 0.4 kV. They are laid in a trench at a depth of 0.7 m from the planning land mark by NYY-1 kV cables.

In the intersection of cable lines with engineering facilities the cable is laid in asbestos-cement pipes-sleeves.

Power electrical equipment section and electrical lighting pumping developed on the basis of the architectural and construction section of the project in compliance with existing electrical codes and regulations.

As a power control board the power shield with automatic switches and built-in start-up protection equipment for units not equipped with its own automation panel was adopted.

Power supply is 380/220 V. The power input is conducted with a cable with copper wires NYY.

Working lighting is provided for the project.

The voltage of the main supplies for lighting lamps is 220V. The methods and locations of the luminaires are shown on the plan. The lighting control is provided by switches in place.

To protect the operating personnel from electric shock in the event of touching the metal parts of electrical installations that are not under voltage but which could be placed under it as a result of insulation damage the protective earthing is provided. Earthing shall be implemented by connecting the equipment body frame to the earthing strip of the protective external loop set consisting of 0 22 mm round steel electrodes and steel strip 40x4mm.

Production of all the works should be conducted in strict accordance with the RIEE (rules of installation of electric equipment) and the construction norms of Turkmenistan.

WORK SHEET OF WORKING DRAWINGS OF THE BASIC SET PSEEL

Sheet	Denomination	Note
1	General data	
2	Electric lighting plan. Plan of power networks. Calculation scheme. Earthing.	

WORK SHEET OF REFERENCE AND SUPPLIED DOCUMENTS

Designation	Denomination	Note
REFERENCE DOCUMENTS		
RIEE -87. Edition.6	Rules for the installation of electrical equipment	
BCN 59-88	Electric equipment of residential and public buildings	
ATTACHED DOCUMENTS		
	Specification of equipment for working drawings of “EM”	On sheet 1

Graphical symbols

Designation	Denomination	Note
B	Power distribution shield	
47	Wall mounted lamp wall with incandescent lamp with power 60 watt	
б	Single-pole circuit breaker for current 10A, 250V	
	Cable line of power supply	

The project is developed in accordance with acting regulations and rules, and provides for activities that provide explosive, fire and fire safety in the operation of the building.

The chief architect of the project

GENERAL INSTRUCTIONS

Pumping house

The purpose of this project is to provide power supply to the pumping house in the Enish 2 village in the city. Sayat (vel. Lebap).

In terms of reliability and continuity of power supply, the projected facility belongs to the III-category consumer. The project provides for connecting the pump from the existing complete transformer.

In this project, a cable version of 0.4 kV indoor networks is adopted. Cable lines 0.4 kV. They are laid in a trench, at a depth of 0.7 m from the planning land mark by NYY-1 kV cables. In the intersection of cable lines with engineering facilities, the cable is laid in asbestos-cement pipes-sleeves.

Section power electrical equipment and electrical lighting pumping developed on the basis of the architectural and construction section of the project in compliance with existing electrical codes and regulations.

As a power administrative shield, a power shield with automatic switches and integrated starter protection equipment for units that are not equipped with their own automation panel is accepted.

Power supply is 380/220 V. The power input is conducted with a cable with copper wires NYY.

The working lighting is provided by the project.

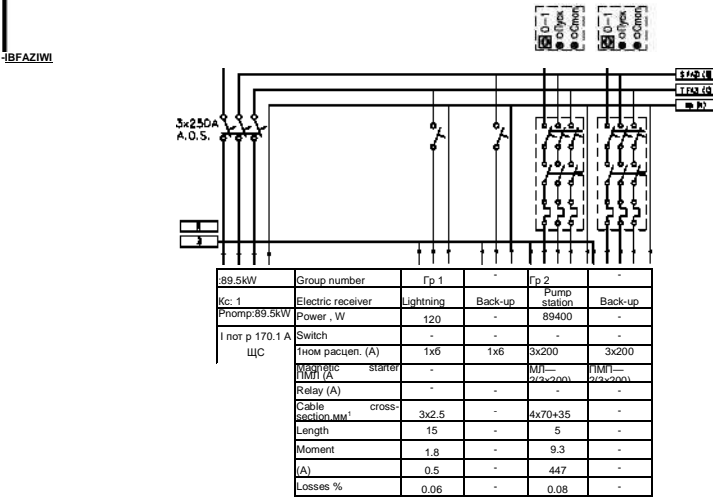
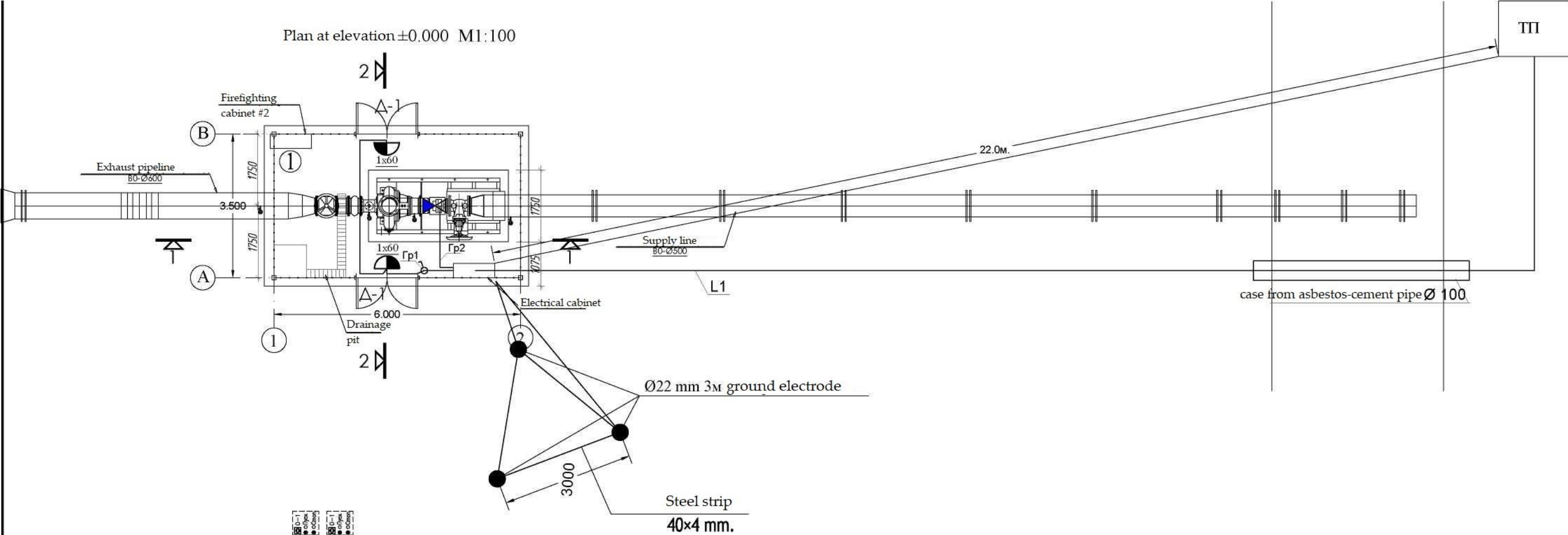
The voltage of the mains supply for lighting lamps is 220V. The methods and locations of the luminaires are shown on the plan. The lighting control is provided by switches on place.

To protect the operating personnel from electric shock in case of touching the metal parts of electrical installations that are not under voltage but which could be placed under it as a result of insulation damage the protective earthing is provided. Earthing is implemented by connecting the equipment housings to the earthing strip of the protective external loopset which consists of 0 22 mm round steel electrodes and a steel strip 40x4mm.

Production of all the works should be conducted in strict accordance with the RIEE (rules of installation of electric equipment) and the construction norms of Turkmenistan.

				Installation of a pumping station in the village Enish 2 et. Sayat (Lebap)			
H3M.N yч	Sheet N	Signature	Date				
				Pumping house	Stage	Sheet	Sheets
PMG					PII	1	2
Eng.							
				General data			

Specification of main equipment			
Position #	Name	Quantity	Note
1	Water booster system	1 worker	
	Q=1800.0m3/hour, H=5.0m		



1. All dimensions are given in mm.
2. The final dimensions of the construction shall be clarified by the place of construction

Cable #	Beginning (name of building and shield designation)	End (same)		Cable	Pipe			Load			Loss		Note	
			Brand	Quantity of section in mm²	Length, m	Brand	Length, m	Established power, kV	Calculated power, kV	Q < 1—	соед. g	Moment, kV · m		%
POWER CABLES 0,4 kV electric supply of the territory from TP technical premise)														
L1	PY-0,4 kVa ктп	Pumping house	NYY	3x95+1x50	45	In trench	35	89.5	89.5	170.1	0,95	4027.5	0.6	
						a/c 0100	10							

				-- ЭС			
				Installation of a pumping station in the village Enish 2 et. Sayat (Lebap)			
H3M.N	Sheet # measure	Signature	Date	Pumping house	Stage	Sheet	Sheets
					ПІ	2	2
Execution.				Plan of electric lighting. Plan of power supply networks. The calculation scheme. Earthing.			

Position	Denomination and technical characteristics	Type, brand, designation of the document, questionnaire	Code of equipment, unit, material	Factory-manufacturer	Unit measure	Quantity	Unit mass kg	Note
1		3	4	5	6	7	8	9
	Equipment and materials							
	Stations, shields, boxes							
1	Power distribution shield with inductive aut. 1p=3x250A.							
	- with aut.line 1x6A-2pcs, 3x200A-2pcs.							
	- with magnetic starter 3x200A-2pcs.							
	- two-button control button -2pcs.	Individual manufacturer			set.	1		S (power shield)
2	Circuit breaker of RPS 2-250 type for substation unit				piece	1		
	Lighting equipment							
3	Wall Lamp LED 7 Vt				piece	2		
4	LED lamp 7 Vt				piece	2		
	Wiring device							
5	Single-pole breaker for current 10A, 250 V external device is leakproof				piece	48		
	Cableware							
	Power cable with copper conductors, PVC insulated, sec:							
6	3x2,5	NYM			m	15		
7	4x70+35	NYM			m	5		
8	3x95+1x50	NYM			m	45		
	Earthing							
9	Vertical electrode 022mm, b=3m				piece	3		
10	Flat steel 40x4mm				m	25		
	PVC pipes							
11	Vinyl plastic pipe with outside diameter 20 mm	PVC REB 20			m	15		
12	Asbestos-cement pipe with external diameter 100 mm	a/c 0 100			m	10		

Work sheet of volume of construction and electrical works.

Nº	Denomination	Unit mea sure	Quant ity	Note
1	Construction length of trench T 1		30	
2	Trench excavation T 1 for cabling of 1m 0,31m³		9.3	
3	Backfilling of trenches T 1 for 1m 0,23m³		6.9	
4	Arrangement of sand bed T 1		2.4	
5	Covering of cable with bricks (8 pcs/m) T1		240	
6	Cabling in trench		30	
7	Cabling in buildings		20	
8	Cabling in pipes		10	
9	Cabling in TP		5	
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

				-ᲑC.BOP		
				Installation of pumping house #3 bis in Ashgabat city along bypass (Gurtly)		
Position	Name, Family name	Signature	Date	Electrical supply	Stage	Sheet
Prepared					1	1
				Work sheet of volume of construction and electrical works.		

Form A-4

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Position	Designation	Denomination	Quantity	Unit mass, kg	Note
	View A-A		2		
1	TDS 30245-2003	Square pipe O 50x50x3, L=2350	2	9.98	19.96
2	TDS 30245-2003	Square pipe O 50x50x3, L=1500	2	6.37	12.74
3	TDS 30245-2003	Square pipe O 50x50x3, L=1850	2	7.86	15.72
4	TDS 8639-82	Square pipe O 25x25x3, L=3100	20	6.05	121.00
5	TDS 8639-82	Square pipe O 25x25x3, L=900	7	1.75	12.25
6	TDS 103-76	Strip $\frac{[50x8(TDS)]}{C275 TDS 27772-88^*}$ L=200	14	1.25	17.50
		O 50x50x3		кг	48.42
		O 25x25x3		кг	133.25
		Sheet steel t = 8 mm		кг	17.50
		Totally:			216.70
		Totally deposited metal 2%:			4.30
		Totally:			221.00
	View B-B		1		
7	TDS 30245-2003	Square pipe O 50x50x3, L=3400	3	14.50	43.50
8	TDS 8639-82	Square pipe O 25x25x3, L=1900	3	3.70	11.10
9	TDS 8639-82	Square pipe O 25x25x3, L=900	3	1.75	5.25
10	TDS 8639-82	Square pipe O 25x25x3, L=3100	14	6.05	84.70
		O 50x50x3		kg	43.50
		O25x25x3		kg	101.05
		Totally:			144.55
		Totally deposited metal 2%:			2.90
		Totally:			147.45

Position	Designation	Denomination	Quantity	Unit mass, kg	Note
	View B-B		1		
7	TDS 30245-2003	Square pipe O 50x50x3, L=3400	3	14.50	43.50
10	TDS 8639-82	Square pipe O 25x25x3, L=3100	14	6.05	84.70
11	TDS 8639-82	Square pipe O 25x25x3, L=2300	3	4.50	13.50
		O 50x50x3		kg	43.50
		O25x25x3		kg	98.20
		Totally:			141.70
		Totally deposited metal 2%:			2.80
		Totally:			144.50

1. Work together with sheets AC-
2. For the details, steel C2 75 (VSzPsb) according to TDS 27772-88 * is used.
3. Joints of metal structures to be produced by manual electric arc welding with TDS 5264-80 electrodes type E42 according to TDS9467-75. The height of the leg of all welded seams except for those indicated in the drawings is taken by the smallest thickness of the welded elements.
4. The maximum permissible clearance between the edges of the joined elements is-2mm.
5. All welds must be cleaned of slag.
6. All metal structures painted with nitro-enamel paint 2 times.
7. All dimensions of metal structures are given in millimeters (mm).
8. To fix the metal tile to the girders using self-tapping screws,
and each tile is fastened with combined rivets (300 mm pitch).

Position	Name, Last name	Signature	Date				
				Pumping house	Stage	Sheet	Stages
						4	
				Layout of embedded parts and racks. View “A-A”, “B-B” and “B-B”. Specification.			

Technical drawing of a rectangular structure, likely a wall or partition, showing dimensions and labels.

Dimensions:

- Overall height: 3200
- Overall width: 3500
- Top offset: 3.00
- Bottom offset: -0.20

Labels and Callouts:

- 10: Horizontal dimension line across the middle section.
- 11: Vertical dimension line on the right side.
- 7: Callout pointing to the right edge of the structure.
- A: Section line at the bottom left.
- B: Section line at the bottom right.

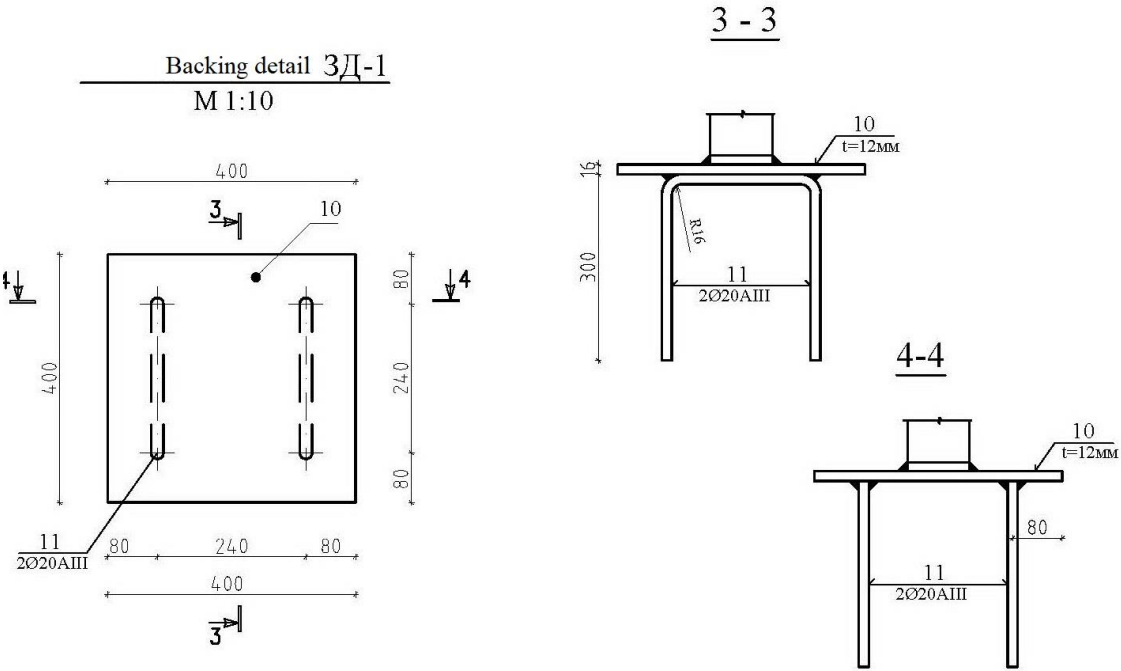
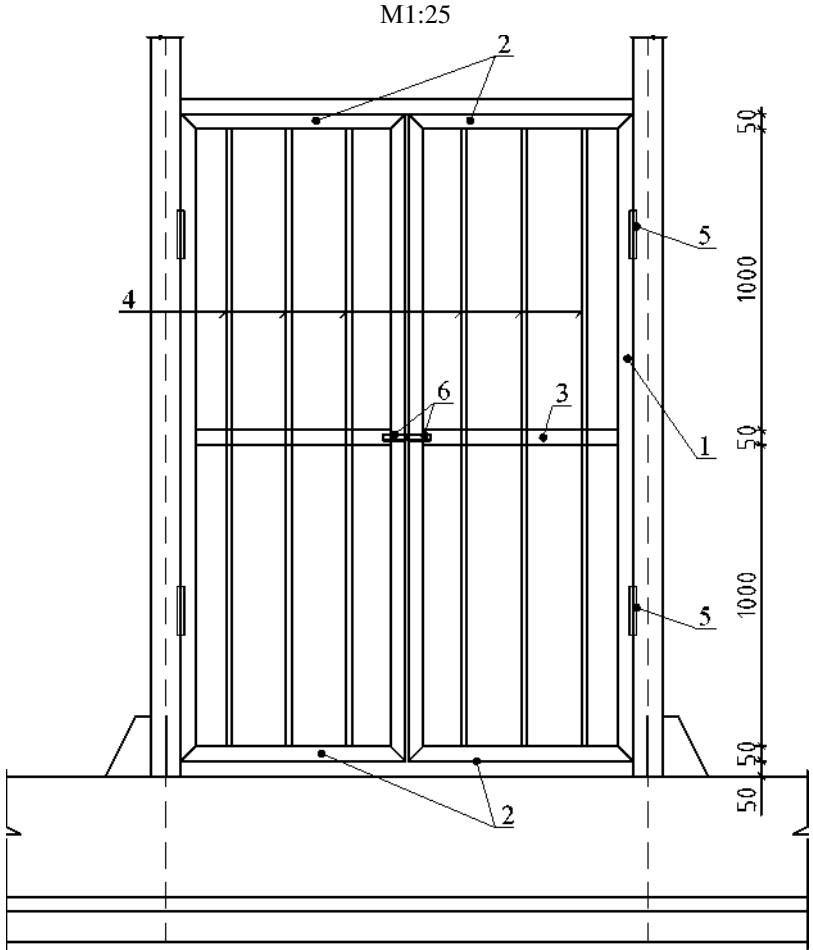
Structural Details:

- The structure consists of vertical bars (rebar) and horizontal bars (rebar).
- The top and bottom edges are reinforced with a concrete slab.
- The structure is supported by a foundation.

Specification of metal (for unit).

Position	Designation	Denomination	Quantity	Unit mass, kg	Note
	Metal door D-1		2		
1	TDS 30245-2003	Square pipe O 50x50x3, L=2150	4	9.14	36.56
2	TDS 30245-2003	Square pipe O 50x50x3, L=745	4	3.16	12.64
3	TDS 30245-2003	Square pipe O 50x50x3, L=650	2	2.76	5.52
4	TDS 8639-82	Square pipe O 25x25x3, L=2100	6	4.10	24.60
5		Loop by series 3.017-1.05.110.100	4		
6		Handle by series 3.017-1.05.110.300	2		
		O 50x50x3		кг	54.72
		O 25x25x3		кг	24.60
		Total:			79.32
		Total deposited metal 2%:			1.60
		Total:			80.92

Door D-1



Remarks:

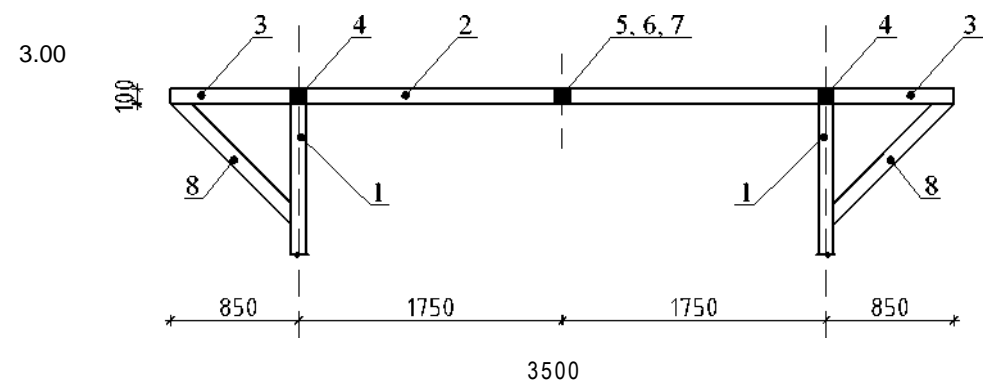
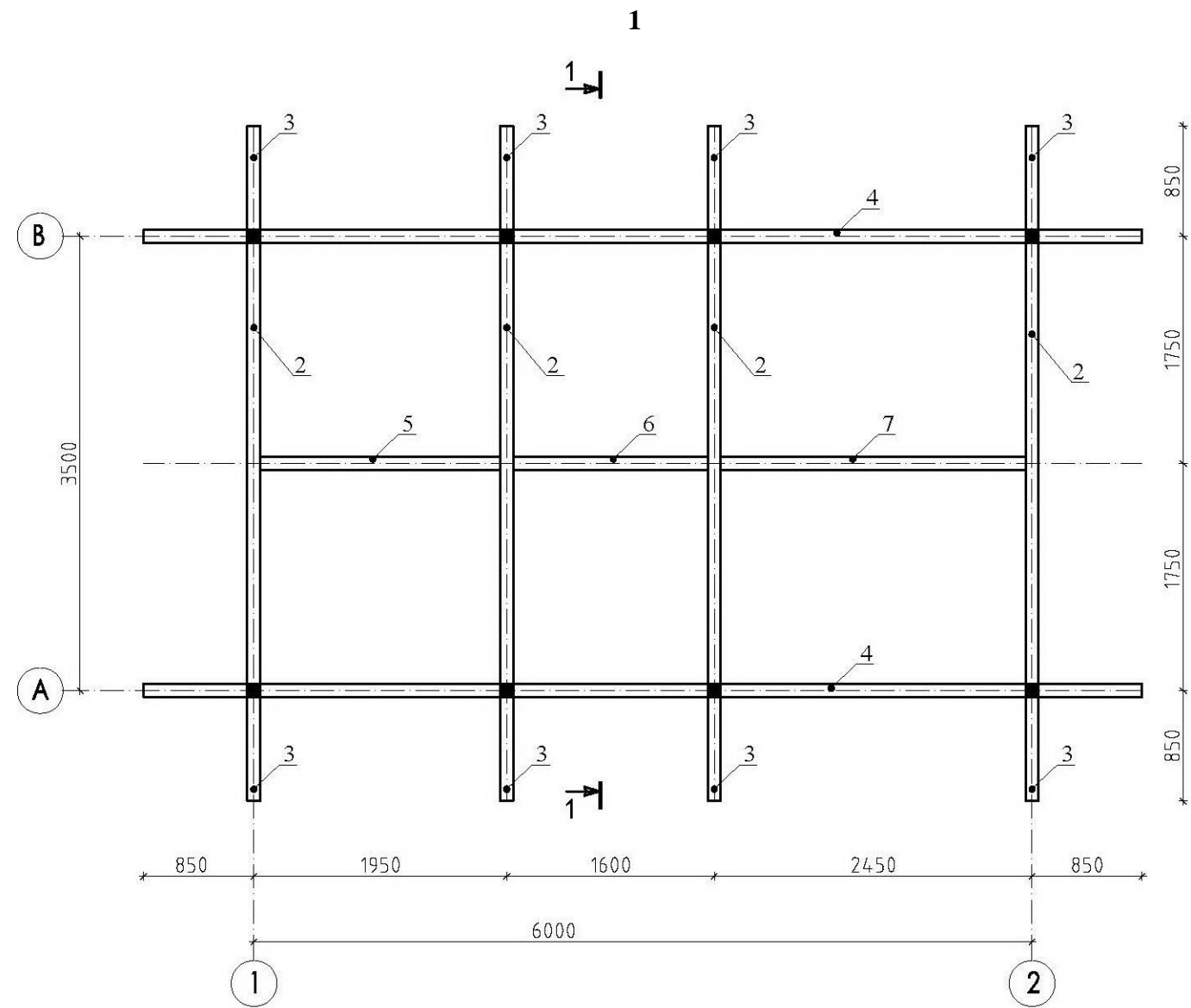
1. Work together with AC sheets-
2. For the details, steel C275 (VStZPsb) according to TDS 27772-88 * is used.
3. Joints of metal structures to be produced by manual electric arc welding with TDS 5264-80 electrodes type E42 according to TDS9467-75. The height of the leg of all welded seams except for those indicated in the drawings is taken by the smallest thickness of the welded elements.
4. The maximum permissible clearance between the edges of the joined elements is-2mm.
5. All welds must be cleaned of slag.
6. All the metal structures should be painted with nitro-enamel paint for 2 times
7. All dimensions of metal constructions are given in mm.

SPECIFICATION OF METAL ELEMENTS					
Position	Designation	Description	Q-ty	Weight unit, kg	Note
		Folding part ZD-1	8		
10	TDS 103-76	Stripe ^{400x12 fTDS1} L-400 Stripe ^{C275 TDS} 27772-88*	1	15.10	15.10
11	TDS 5781-82*	020A-III L=620	2	1.53	3.06

POSITION	Name, Last name	Signature	Date				
				Pumping house	Stage	Stork	Sheets
					РП	4	
				Metal door D-1. __Folding part_ZD-1.			
				Specification.			

Plan of elements disposition on the mark 3.00.

M1:50



Specification of metal (for unit)

Position	Designation	Denomination	Q-ty	Weight unit, kg	Note
1	TDS 25577-73*	square pipe O 100x100x5, L=3100	8	43.21	345.68
2	TDS 25577-73*	square pipe O 100x100x5, L=3400	4	47.39	189.56
3	TDS 25577-73*	square pipe O 100x100x5, L=800	8	11.15	89.20
4	TDS 25577-73*	square pipe O 100x100x5, L=7700	2	107.33	214.66
5	TDS 25577-73*	square pipe O 100x100x5, L=1850	1	25.78	25.78
6	TDS 25577-73*	square pipe O 100x100x5, L=1500	1	20.91	20.91
7	TDS 25577-73*	square pipe O 100x100x5, L=2350	1	32.76	32.76
8	TDS 25577-73*	square pipe O 100x100x4, L=1030	12	11.88	142.56
		O100x100x5		кг	918.54
		O 100x100x4		кг	142.56
		Total:			1061.10
		Total deposited metal 2%:			21.20
		Total:			1082.30

Note:

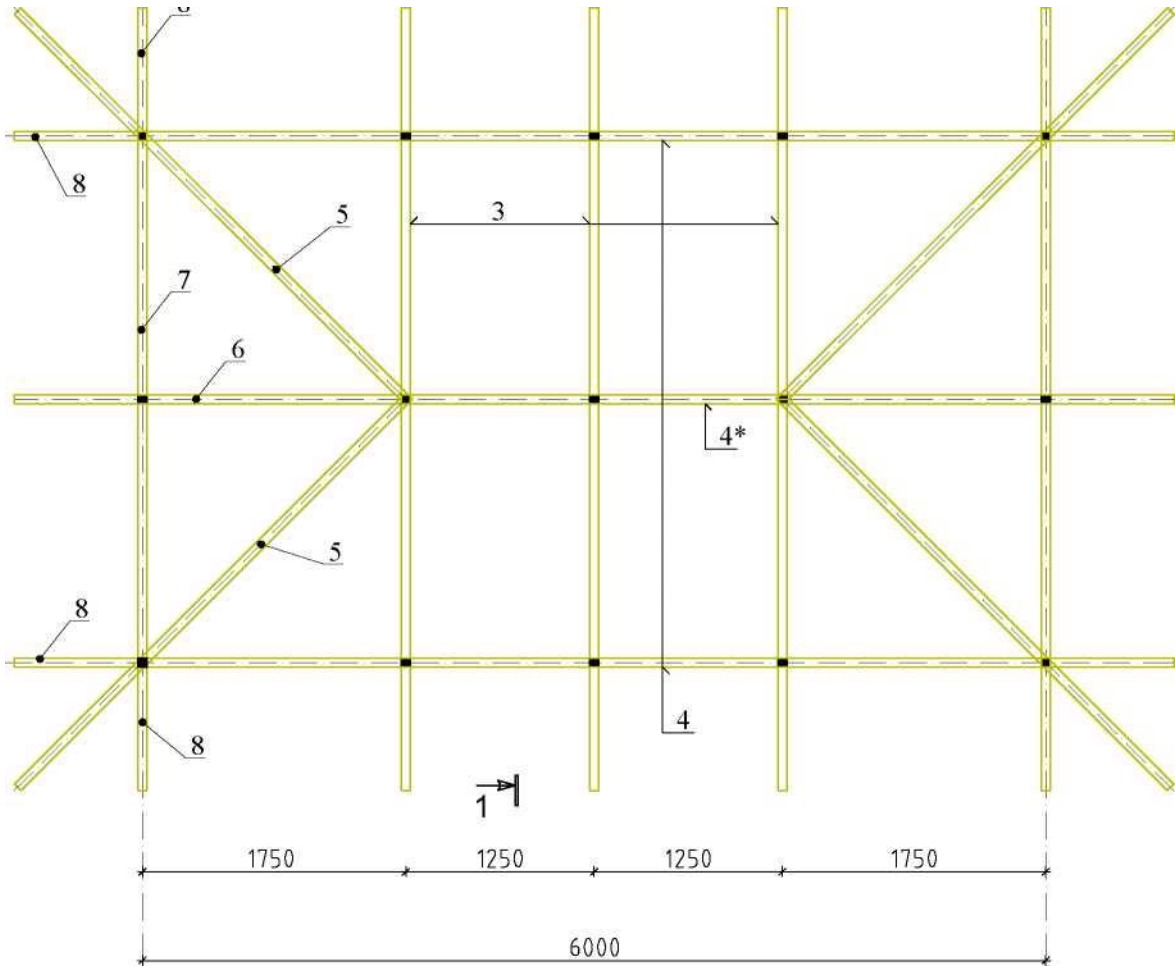
1. Work together with sheets AC-
2. For the details, steel C2 75 (VStZPsb) according to TDS 27772-88 * is used.
3. Joints of metal structures to be produced by manual electric arc welding with TDS 5264-80 electrodes type E42 according to TDS9467-75. The height of the leg of all welded seams, except for those indicated in the drawings, the smallest thickness of the welded elements.
4. The maximum permissible clearance between the edges of the joined elements is-2mm.
5. All welds must be cleaned of slag.
6. All the metal structures painted with nitro-enamel paint for 2 times.
7. All dimensions of metal structures are given in millimeters (mm).
8. Secure the metal tile to the girders using self-tapping screws, and each tile is fastened with combined rivets (300 mm pitch).

Position	Name, Last name	Signature	Date				
				Pumping house	Stage	Sheet	Sheets
					РП	4	
				Plan of elements disposition on mark 3.00. Cross-section 1-1. Specification.			

Plan of disposition of elements of roof Kp-1.

M1:50

1

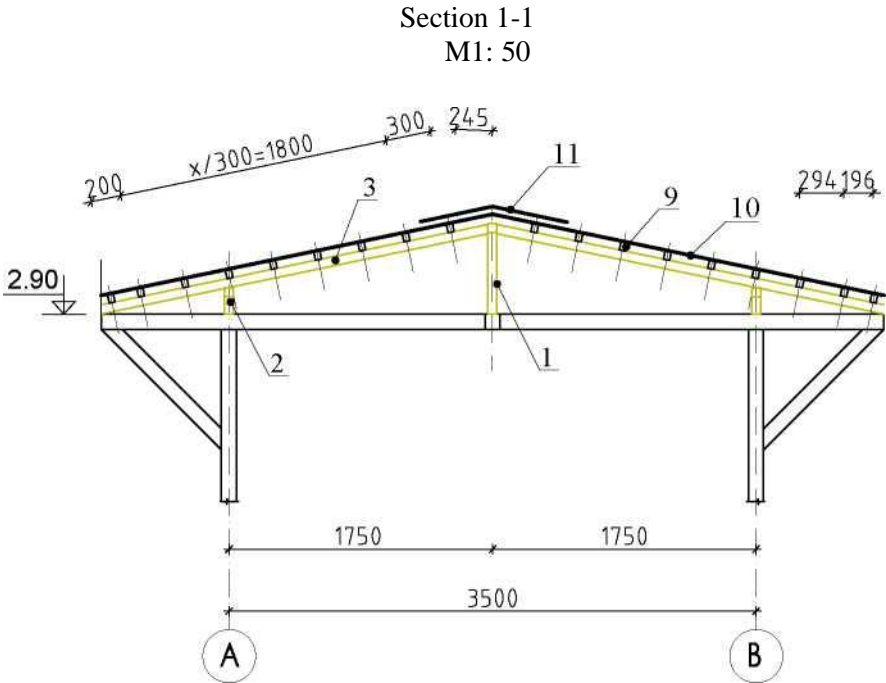


Specification of metal (for unit).

Position	Designation	Denomination	Q-ty.	Weight unit, kg	Note
1	TDS 30245-2003	square pipe O 60x60x5, L=540	3	4.39	13.17
2	TDS 30245-2003	square pipe O 60x60x5, L=180	12	1.46	17.52
3	TDS 30245-2003	square pipe O 60x60x5, L=2620	6	25.36	152.16
4	TDS 30245-2003	square pipe O 60x60x5, L=5940	2	48.29	96.58
4*	TDS 30245-2003	square pipe O 60x60x5, L=2440	1	19.83	19.83
5	TDS 30245-2003	square pipe O 60x60x5, L=3700	4	30.08	120.32
6	TDS 30245-2003	square pipe O 60x60x5, L=2680	2	21.78	43.56
7	TDS 30245-2003	square pipe O 60x60x5, L=3440	2	27.96	55.92
8	TDS 30245-2003	square pipe O 60x60x5, L=875	8	7.11	56.88
9	TDS 30245-94	square pipe O 60x40x3, h=147.80 m.	---	4.25	628.10
10	Metal tile roofing	t=0.5 mm	---	---	45.40 м2 204.30 кг
11	Steel TDS 14918-80	t=0.7mm, L=2000x500	9	5.50	47.41
		O 60x60x5		кг	575.90
		O 60x40x3		кг	628.10
		Total:			1204.00
		Total deposited metal 2%:			24.10
		Total:			1228.10

Note:

1. Work together with sheets AC-
2. For the details, steel C275 (VStZPsb) according to TDS 27772-88 * is used.
3. Joints of metal structures to be produced by manual electric arc welding according to TDS 5264-80 with electrodes type E42 according to TDS9467-75. The height of the leg of all welded seams except for those indicated in the drawings is taken by the smallest thickness of the welded elements.
4. The maximum permissible clearance between the edges of the joined elements is-2mm.
5. All welds must be cleaned of slag.
6. All the metal structures painted with nitro-enamel paint for 2 times.
7. All dimensions of metal structures are given in millimeters (mm).
8. Metal tile fasten to the girders by means of screws, and each tile is fastened with combined rivets (step 300mm).



Position	Name, last name	Signature	Date				
				Pumping house	Stage	Sheet	Sheets
					РП	4	
				Plan for the location of roof elements Kr-1. Section 1-1.			
				Specification.			

WORK SHEET OF VOLUMES OF CONSTRUCTION AND INSTALLATION WORKS

(number of unit)

1	2	3	4	5	6
		Square pipe 100x5	kg	918.54	
		Square pipe 100x4	kg	142.56	
		Square pipe 60x5	kg	575.90	
		Square pipe 60x40x3	kg	628.10	
		Square pipe 50x3	kg	293.30	
		Square pipe 25x3	kg	514.95	
		Sheet t= 12 mm	kg	120.80	
		Sheet t=8 mm	kg	35.00	
		Sheet t=0.7 mm	kg	47.41	
		Armature AIII	kg	48.70	
		Metal tile	kg	204.30	
		Concrete B10	m ³	3.50	
		Concrete B20	m ³	15.75	
		Cement strainer	m ³	1.75	
		Isogam	m ²	35.04	
		Bituminous bitumen coating for 2 times	m ²	6.90	
		Drawn soil	m ³	40.00	
		GGS (gas generator system)	m ³	7.80	
		Concrete B15	m ³	1.22	

WORK SHEET OF WORKING DRAWINGS OF THE BASIC SET		
Sheet	Denomination	Note
01	General data	TX
02	Plan of pumping house on mark ±0,000.	TX
03	Section 1-1 with sites M1:50.	TX
04	Axonometric diagram of the VO networks.	TX

General Data

In this part of the project the technological solutions for the installation of the pump are presented.

The work of the pumping house is provided without permanent staff on duty. Control of the pump is implemented automatically.

Technical solutions are taken with account of above-ground execution and installation of pumps under the bay from the calculated level.

The pumping station for pumping water provides installation from a single pump with a capacity of Q = 1800m³/h, H = 5.0m.

- The exhaust pipeline is introduced into the channel at an angle of 45 ° and is a steel pipe 0630x14.0 mm with an input section equipped with a containment grate. The exhaust pipe is obligatory equipped with a gate valve, a mechanical filter, a compensator and manometers.

After installation, the steel pipelines and pipeline valves should be painted on the surface of the PF-133 or PF-155 enamel, cleaned of rust, 1 layer of GF-0119 primer. Insulation of the outer surface of steel pipelines outside the pumping station should be "highly enhanced" based on bitumen mastics or polymer adhesive tapes in accordance with GOST 9.602-89. In places where pipelines pass through the walls of tanks, a device of ribbed branch pipes with flexible inserts is provided.

Installation of the systems and mandatory intermediate acceptance of the performed work shall be carried out in accordance with SNIP 3.05.01-85.

The pump station is equipped with two fireproof cabinets and two powder OP-6 and carbon dioxide OU-6 fire extinguishers. The project provides for the installation of equipment supplied complete with units with shut-off, safety and control valves, control devices, as well as control and automation panels.

WORK SHEET OF REFERENCE AND SUPPLIED DOCUMENTS		
DESIGNATION	DENOMINATION	NOTE
Reference documents		
SNT 2.04.02-00	Water supply. External networks and facilities.	
SNT 2.04.01-98	Internal water supply and sewerage system	
	Attached documents	
TX.C	Equipment Specification	On sheet 1

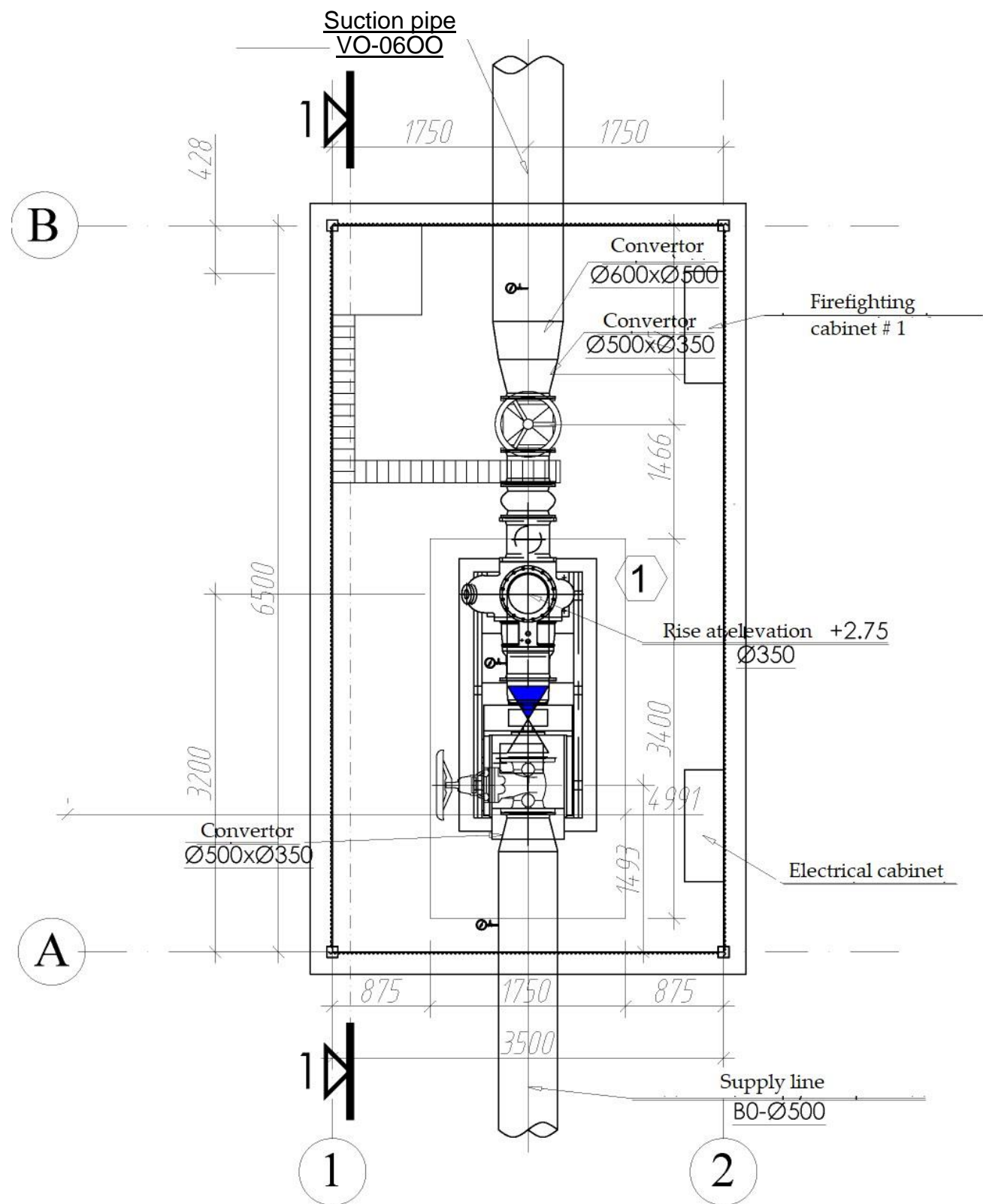
MAIN INDICATORS FOR DRAWINGS OF WATER SUPPLY AND SEWERAGE					
System denomination	Estimated expense			Installed power el.engine	Note
	m3 / day	m3 /hour	l/sec		
B1	32400	1800.0	500.0		

The project has been developed in accordance with acting regulations and rules and provides for activities that provide an explosive, explosion and fire safety during operation of a building.

Chief Engineer of the project

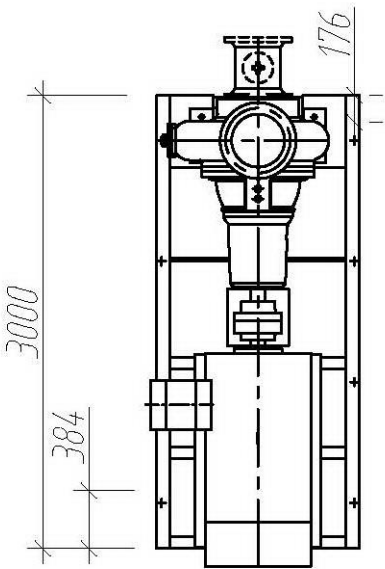
Mea	Q-ty.	Sheet		Signature	Date				
						Pumping of the 1 st lift	Stage	Sheet	Sheets
Impl.							PII	1	4
						General data			

Plan of pumping house



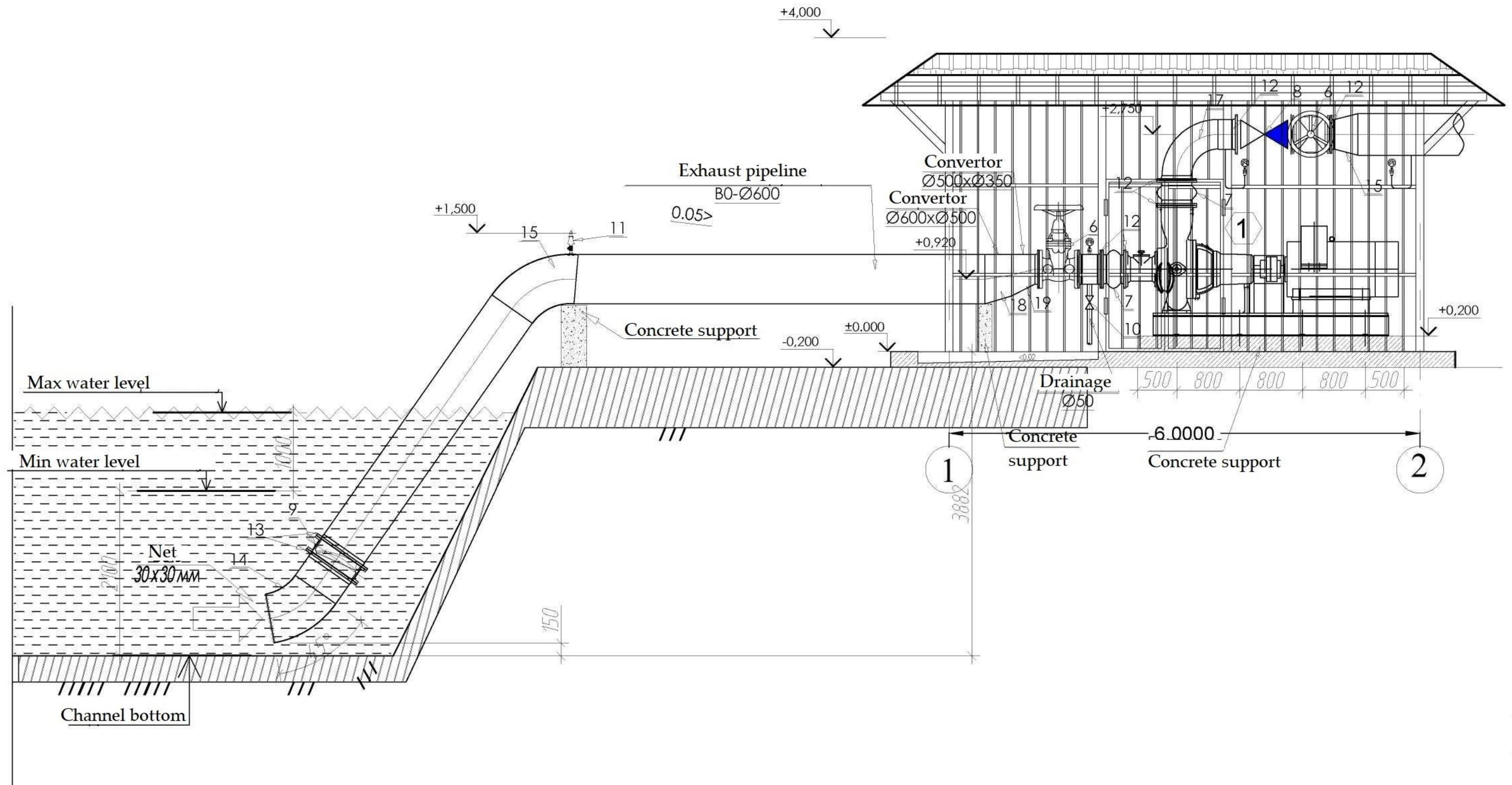
SPECIFICATION OF MAIN EQUIPMENT

No of position	Denomination	Quantity	Note
1	Pressure boosting unit	1 worker	
	Q = 1800.0 m³ / h, H = 5.0 m		

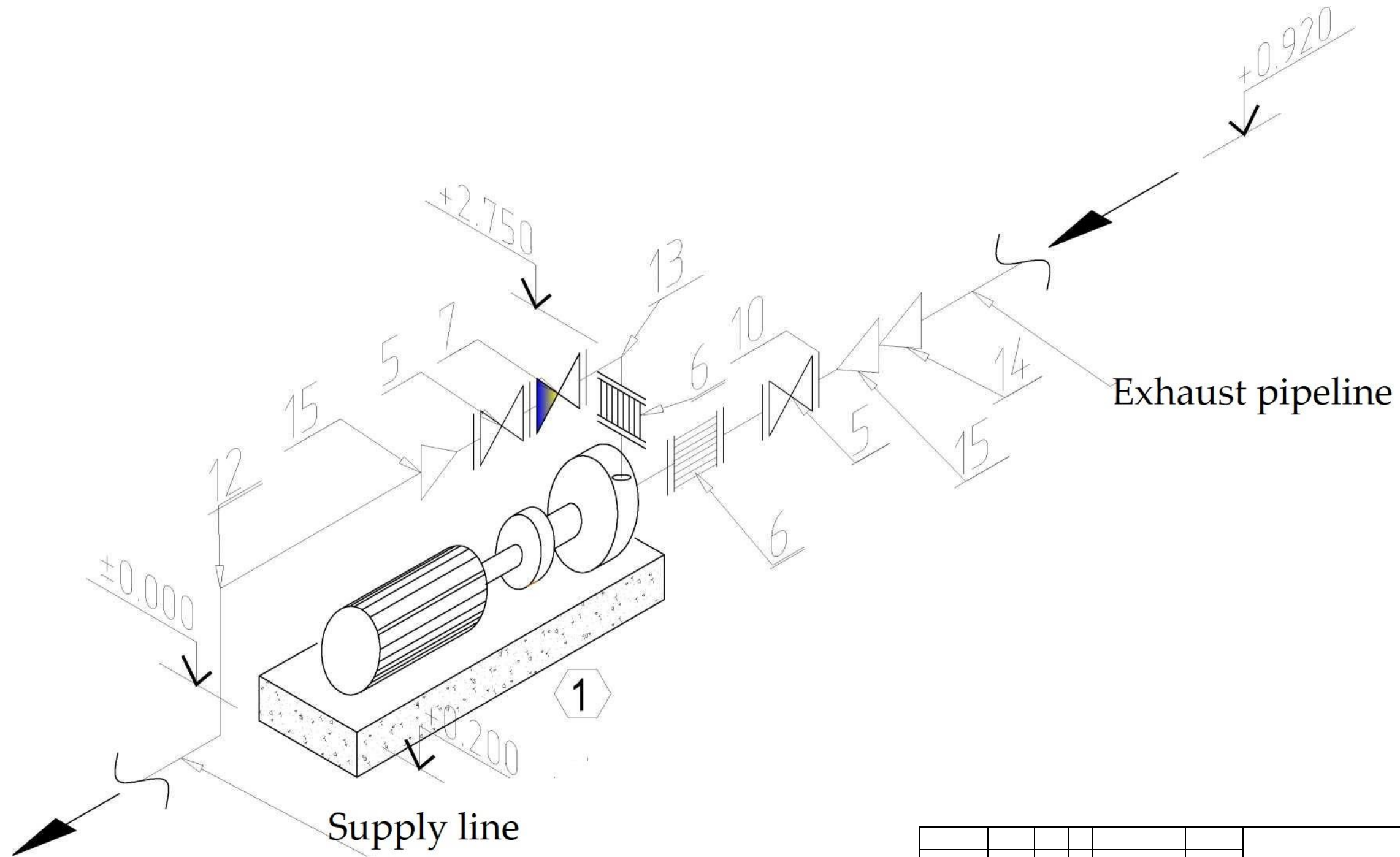


Mea	Q-TY	Sheet		Signature	Date					
						Pumping house of the 1 st lift	Stage	Sheet	Sheets	
Impl.							PII	2	4	
						Plan of pumping housing on mark. ±0,000.				

Cut 1-1 M1:100



Axonomic scheme of PS (package system) networks



Measure.	Q-ty.			Signature.	Date				
						Pumping house of the 1 st lift	Stage	Sheet	Sheets
Impl.							PII	4	4
						Axonometric diagram of the VO networks.			

Signature and date

Inv. No.

Position	Name and technical characteristics	Type, mark, designation of the document, questionnaire	Code of equipment, products, material	Manufacturer.	Unit measure	Quantity	Weight of unit, kg	Note				
1	2	3	4	5	6	7	8	9				
	Water supply system - VO											
1	Pressure boosting unit				set	1	On request	1 worker				
	Q = 1800.0 m3/h, H = 5.0 m											
2	Steel electric welded pipe DN630x14.0 (600)	TDS 10704-91			m	12.0±1.0	212,68					
3	Steel electric welded pipe DN530x12,0 (500)	TDS 10704-91			m	29.5±1.0	153,30	The longest 29,5m The shortest 9,0m.				
4	Steel electric welded pipe DN377x9,0 (350)	TDS 10704-91			m	10,0	81,68					
5	Steel electrically welded pipe DN57x3.5 (50)	TDS 10704-91			m	1.0	4.26					
6	Flanged iron gate valve PN10 / DN350		02-350-75*		piece	2	320,0					
7	Rubber expansion joint (flexible insert), flanged PN 10 / DN 350				piece	2	39,7					
8	Check valve reversible full-bore with metal disk for contaminated liquids DN350		302,0x		piece	1	250,0					
9	Reverse valve with rotary disk, flanged PN-1,0MPa 0600mm				piece	1	200,0					
10	Valve DN50				piece	1	7,6					
11	The valve air Py1,0 МПа DN50 combined				piece	2	17,50					
12	Flange steel PN10 DN350	TDS12821-80*			piece	8	24,0					
13	Flange steel PN10 DN600	TDS12821-80*			piece	2	48,8					
14	Bend ст. 45° DN600	TDS17375-2001			piece	1	133,0					
15	Bend ст. . 60° DN600	TDS17375-2001			piece	1	177,3					
16	Bend ст. 90° DN500	TDS17375-2001			piece	2	162,0					
17	Bend ст. 90° DN350	TDS17375-2001			piece	3	78,0					
18	Adapter ст. DN600x500	TDS17378-2001			piece	1	94,0					
19	Adapter ст DN500x350	TDS17378-2001			piece	2	65,0					
20	Manometer showing (0/16 kg / cm2)	TDS 8625-77			piece	3	0,9					
21	Staining of steel pipes with 2 layers of enamel PF-133 or PF-155 on the primer layer GF-0119	TDS 926-82* /GOST 23343-78*			m².	252,5 / 252,5						
22												
			meas		Sheet	doc.	Measure	Date	Pumping house of the 1 st lifting			
			Impl.									
									Specification of materials and equipment			