



## **ELECTRIC POWER SUPPLY**

### **Pumping house**

The aim of this project is to provide for power supply to pumping house in the village of Chashdepe in the Murgap etrap (Mary).

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                                       |      |

GENERAL INSTRUCTIONS

Pumping house

The purpose of this project is to provide power supply to the pumping house in the village of Chashdepe in the Murgap etrap (Mary).

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.

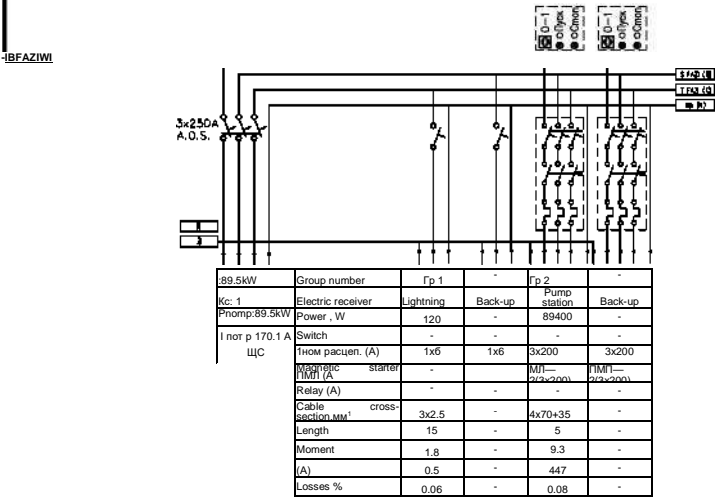
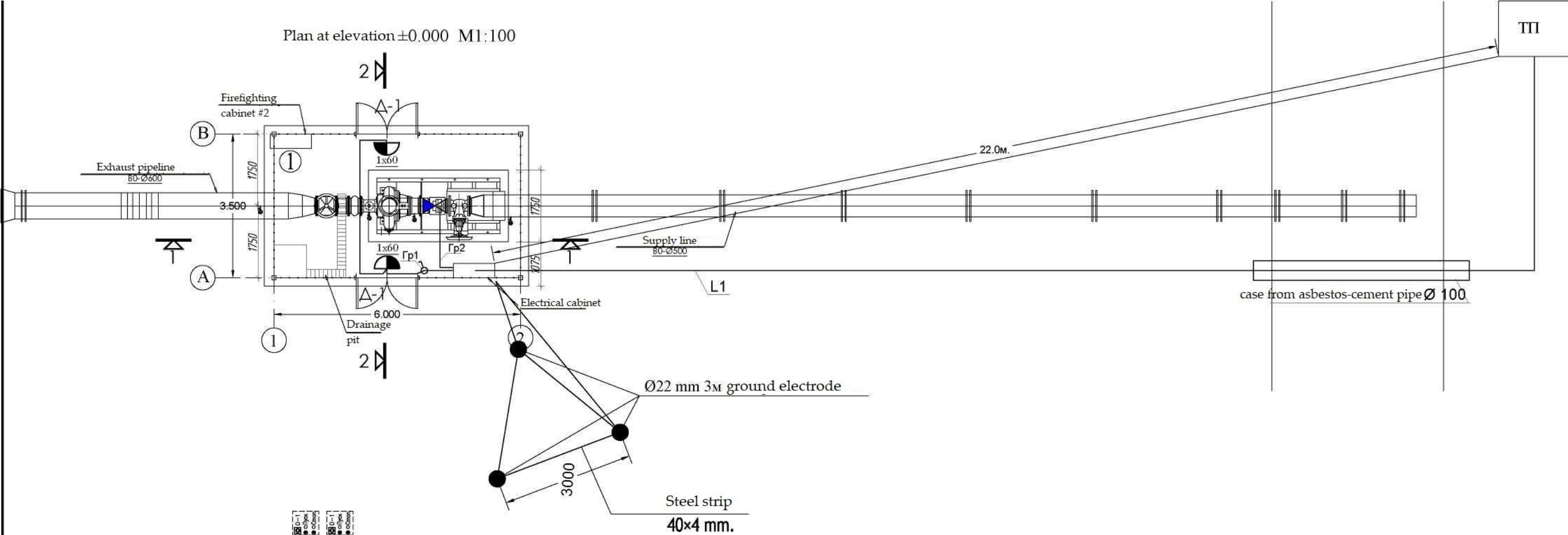
Production of all the works should be conducted in strict accordance with the RIEE (rules of installation of electric equipment) and the construction norms of Turkmenistan.

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|          |         |           |      |   |       |       |        |
|          |         |           |      |   |       |       |        |
|          |         |           |      | Installation of a pumping station in the village of Chashdepe in the etrap of Murgap (Mary) |       |       |        |
| H3M.N yч | Sheet N | Signature | Date |   |       |       |        |
|          |         |           |      | Pumping house   | Stage | Sheet | Sheets |
| PMG      |         |           |      |   | PII   | 1     | 2      |
| Eng.     |         |           |      |   |       |       |        |
|          |         |           |      | General data  |       |       |        |
|          |         |           |      |   |       |       |        |

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

| 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<br>(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, kW | Calculated power, kW | Q < 1— | соедин. | Moment, kV·m | %   |      |
| POWER CABLES 0,4 kV electric supply of the territory from TP technical premise) |  |               |       |                            |           |                       |           |                       |                      |        |         |              |     |      |
| L1  | PV-0,4 kVa ктп   | Pumping house | NYT   | 3x95+1x50                  | 45        | In trench<br>a/c 0100 | 35<br>10  | 89.5                  | 89.5                 | 170.1  | 0,95    | 4027.5       | 0.6 |      |

|            |                 |           |      |   |       |       |        |
|------------|-----------------|-----------|------|---|-------|-------|--------|
|            |                 |           |      | - - ЭС  |       |       |        |
|            |                 |           |      | Installation of a pumping station in the village of Chashdepe in the etrap of Murgap (Mary) |       |       |        |
| H3M.N      | Sheet # measure | Signature | Date |   |       |       |        |
|            |                 |           |      | Pumping house   | Stage | Sheet | Sheets |
|            |                 |           |      |   | PII   | 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       |              |                  |
|          |   |   |                                   |                      |              |          |              |                  |
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Work sheet of volume of construction and electrical works.

| Nº | Denomination                                   | Unit<br>mea<br>sure | Quant<br>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 |  |                     |              |      |
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|----------|-------------------|-----------|------|---|-------|-------|
|          |                   |           |      | -ᲑC.BOP   |       |       |
|          |                   |           |      |   |       |       |
|          |                   |           |      | Installation of pumping house #3 bis in Ashgabat city along bypass (Gurtly) |       |       |
| Position | Name, Family name | Signature | Date |   |       |       |
|          |                   |           |      | Electrical supply   | Stage | Sheet |
|          |                   |           |      |   |       | 1     |
| Prepared |                   |           |      |   |       | 1     |
|          |                   |           |      | Work sheet of volume of construction and electrical works.                  |       |       |
|          |                   |           |      |   |       |       |
|          |                   |           |      |   |       |       |

Form A-4





The diagram illustrates the experimental setup with two parallel tracks, A and B, running horizontally. Track A is at the bottom and Track B is at the top. They are separated by a vertical distance of 3500 mm. Each track has four square stations. The horizontal distance between the first and fourth stations of Track A is 6000 mm. The stations are positioned such that the horizontal distance from the left edge of the first station to the center of the second, third, and fourth stations is 1950 mm. Vertical dimensions of 200 mm are specified for several components: the height of the stations, the width of the tracks, and the distance from the track edges to the centers of the stations. A dashed line labeled '6' indicates a specific measurement or component.

Architectural drawing of a metal door and window assembly. The drawing shows a side elevation of a structure with a door labeled "Дверь Д-1" and a window labeled "2". The structure has a total height of 3200 mm and a total width of 6000 mm. The drawing includes various dimensions for the components and their spacing. The door is 1600 mm wide and 2000 mm high. The window is 1600 mm wide and 1000 mm high. The structure is supported by a base with a height of 300 mm. The drawing also shows the placement of reinforcement bars (numbered 1-6) and the location of the door and window frames.

| 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 $\frac{[150 \times 8] [TDS]}{C275 TDS 27772-88^*}$ L=200 | 14       | 1.25          | 17.50  |
|          |                | O 50x50x3  |          | KГ            | 48.42  |
|          |                | O 25x25x3  |          | KГ            | 133.25 |
|          |                | Sheet steel t = 8 mm   |          | KГ            | 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. |       |       |        |
|          |                 |           |      |   |       |       |        |

A trapezoid with a top horizontal base of 100, a bottom horizontal base of 150, and a right vertical side of 50.

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:**

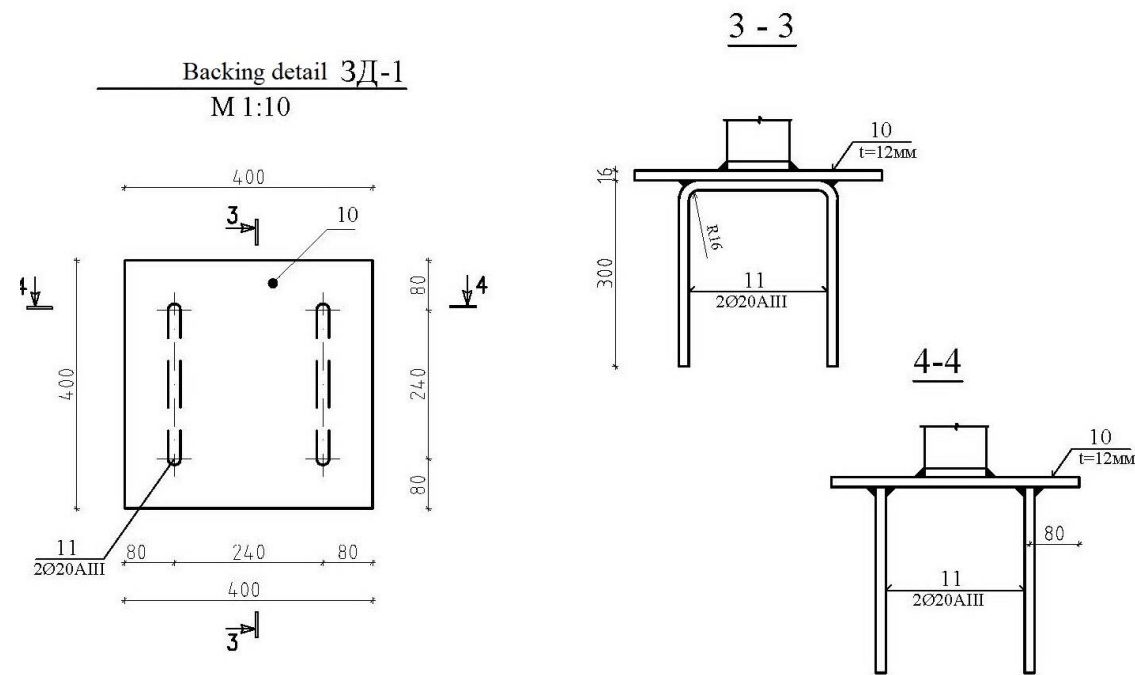
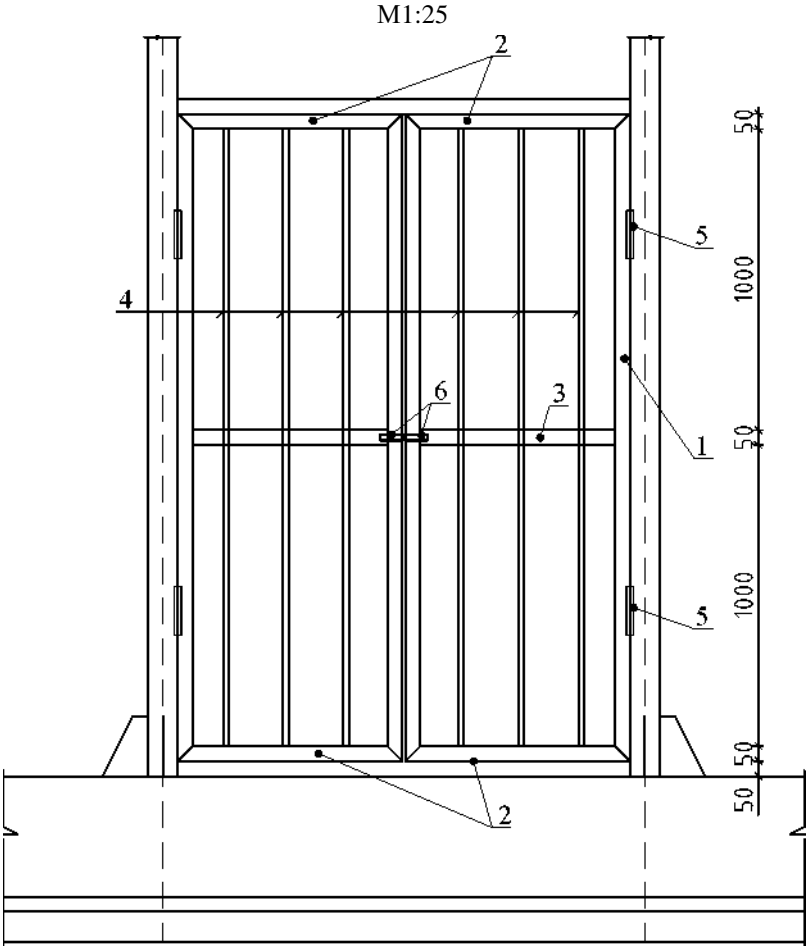
- The structure consists of vertical bars (reinforcement) and horizontal bars (reinforcement).
- The top and bottom edges are reinforced with a layer of concrete.
- The structure is supported by a base.



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:

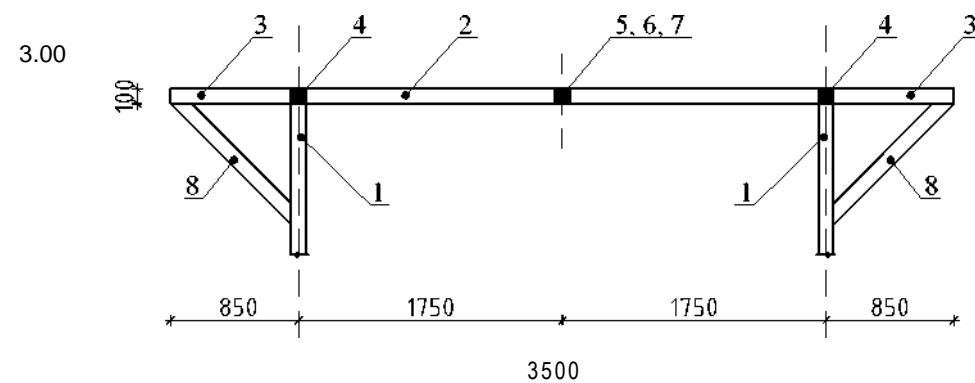
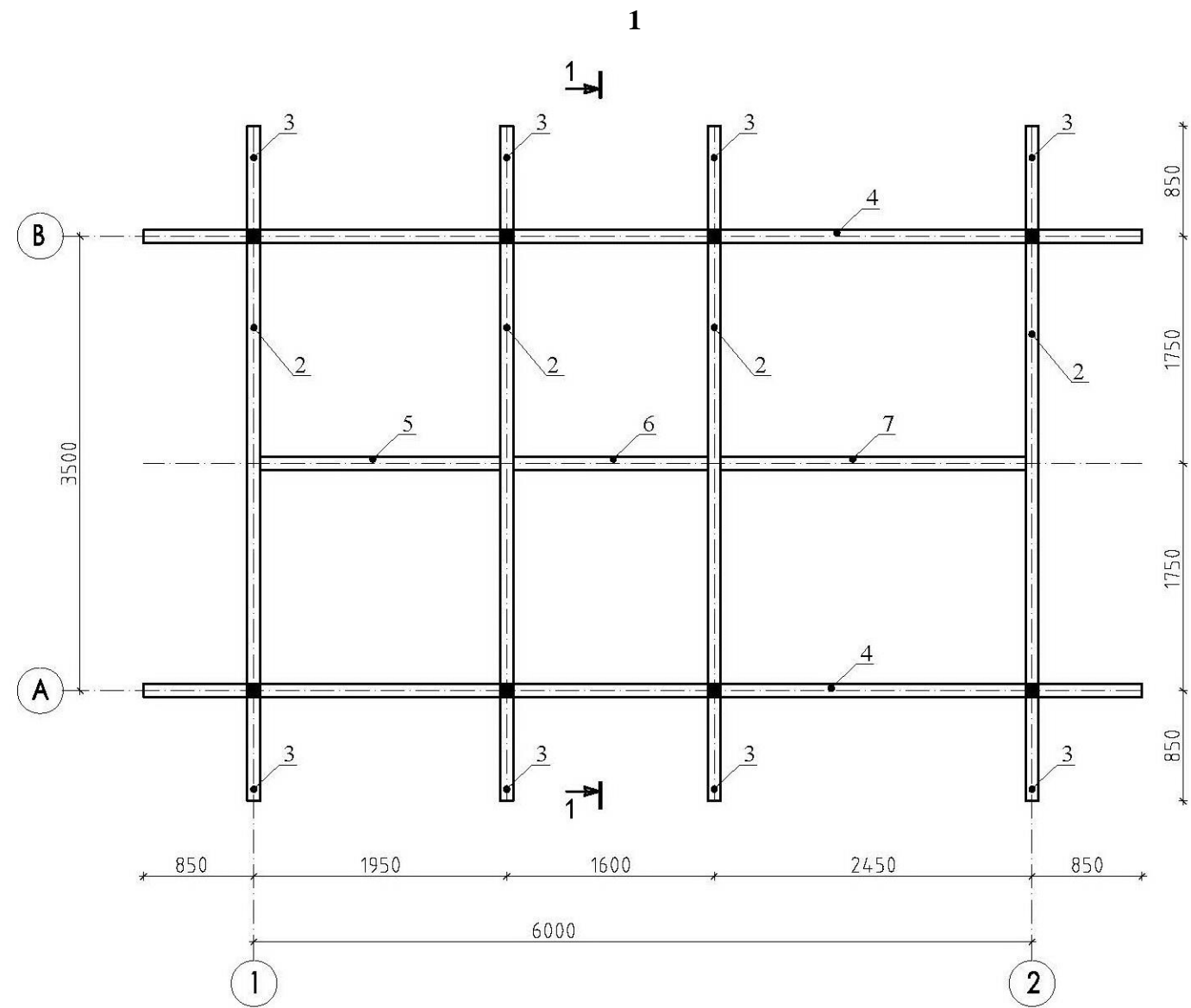
1. Work together with AC sheets-
2. For the details, steel C275 (VStZPsb) according to TDS 27772-88 \* is used.
3. Joints of metal structures to be produced by manual electric arc welding with TDS 5264-80 electrodes type E42 according to TDS9467-75. The height of the leg of all welded seams except for 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 <sup>400x12 fTDS1</sup> L-400 Stripe <sup>C275 TDS</sup> <b>27772-88*</b> | 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:

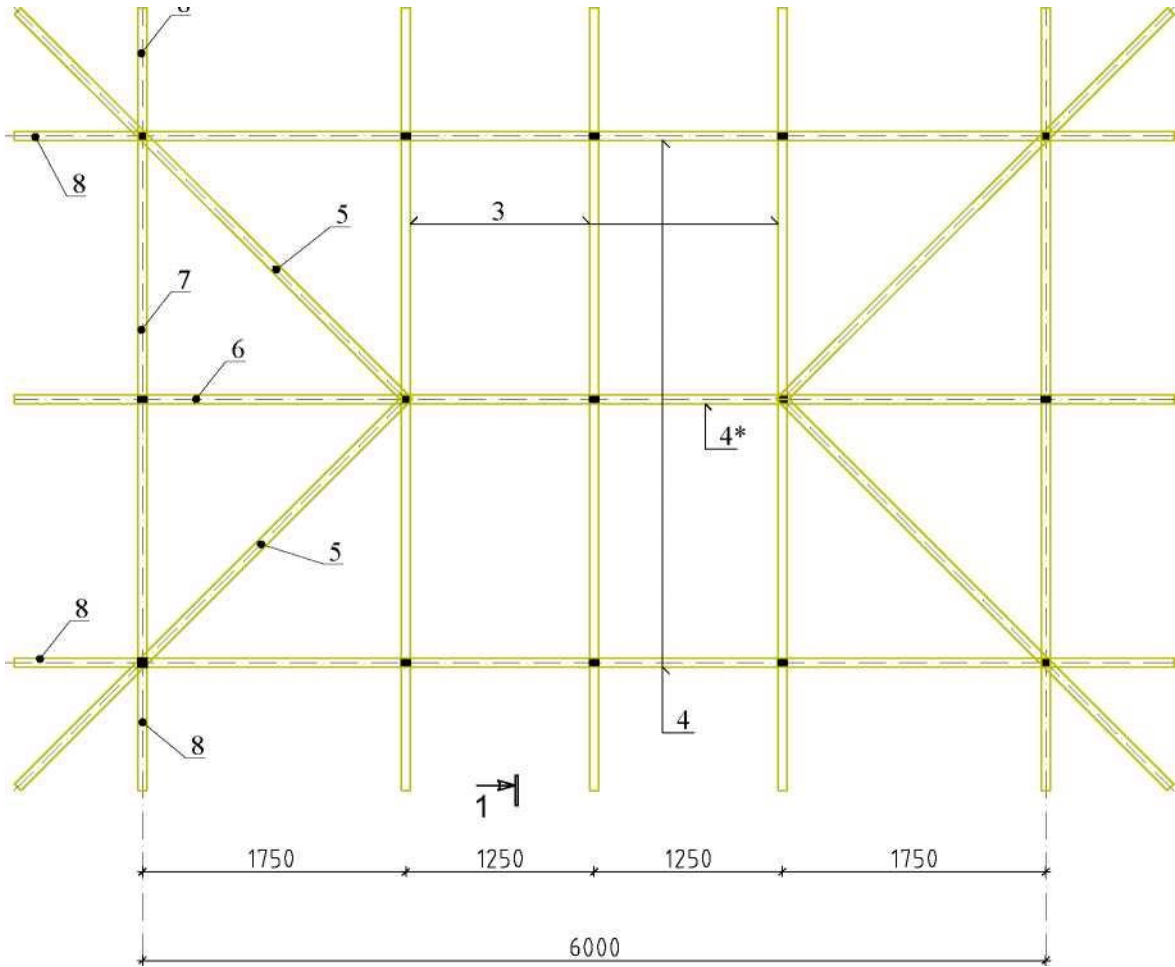
1. Work together with sheets AC-
2. For the details, steel C2 75 (VStZPsb) according to TDS 27772-88 \* is used.
3. Joints of metal structures to be produced by manual electric arc welding with TDS 5264-80 electrodes type E42 according to TDS9467-75. The height of the leg of all welded seams, except 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.<br>Cross-section 1-1. Specification. |       |       |        |
|          |                 |           |      |   |       |       |        |

Plan of disposition of elements of roof Kp-1.

M1:50

1

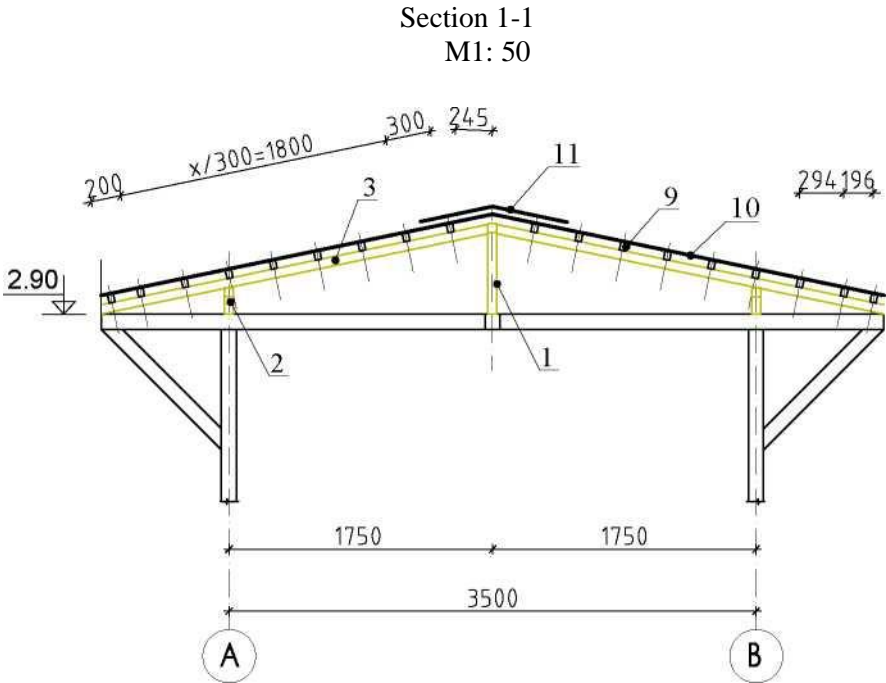


Specification of metal (for unit).

| 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<br>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 <sup>3</sup> | 3.50   |   |
|   |   | Concrete B20                           | m <sup>3</sup> | 15.75  |   |
|   |   | Cement strainer                        | m <sup>3</sup> | 1.75   |   |
|   |   | Isogam                                 | m <sup>2</sup> | 35.04  |   |
|   |   | Bituminous bitumen coating for 2 times | m <sup>2</sup> | 6.90   |   |
|   |   | Drawn soil                             | m <sup>3</sup> | 40.00  |   |
|   |   | GGS (gas generator system)             | m <sup>3</sup> | 7.80   |   |
|   |   | Concrete B15                           | m <sup>3</sup> | 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 <sup>st</sup> lift | Stage | Sheet | Sheets |  |
| Impl. |       |       |  |           |      |                                     | PII   | 1     | 4      |  |
|       |       |       |  |           |      |                                     |       |       |        |  |
|       |       |       |  |           |      | General data                        |       |       |        |  |
|       |       |       |  |           |      |                                     |       |       |        |  |
|       |       |       |  |           |      |                                     |       |       |        |  |



**Suction pipe**  
**VO-0600**

**Converter**  
 $\varnothing 600 \times \varnothing 500$

**Converter**  
 $\varnothing 500 \times \varnothing 350$

**Firefighting cabinet # 1**

**Rise at elevation +2.75**  
 $\varnothing 350$

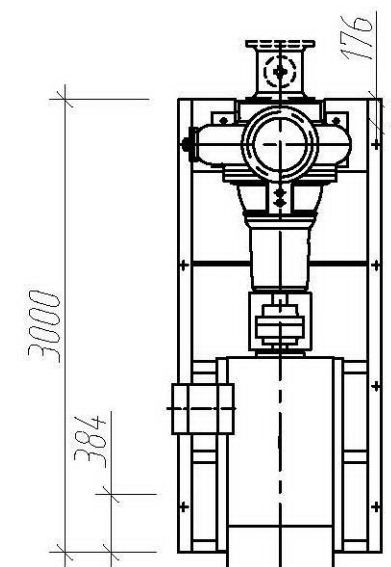
**Electrical cabinet**

**Supply line**  
**B0- $\varnothing 500$**

**Dimensions:**

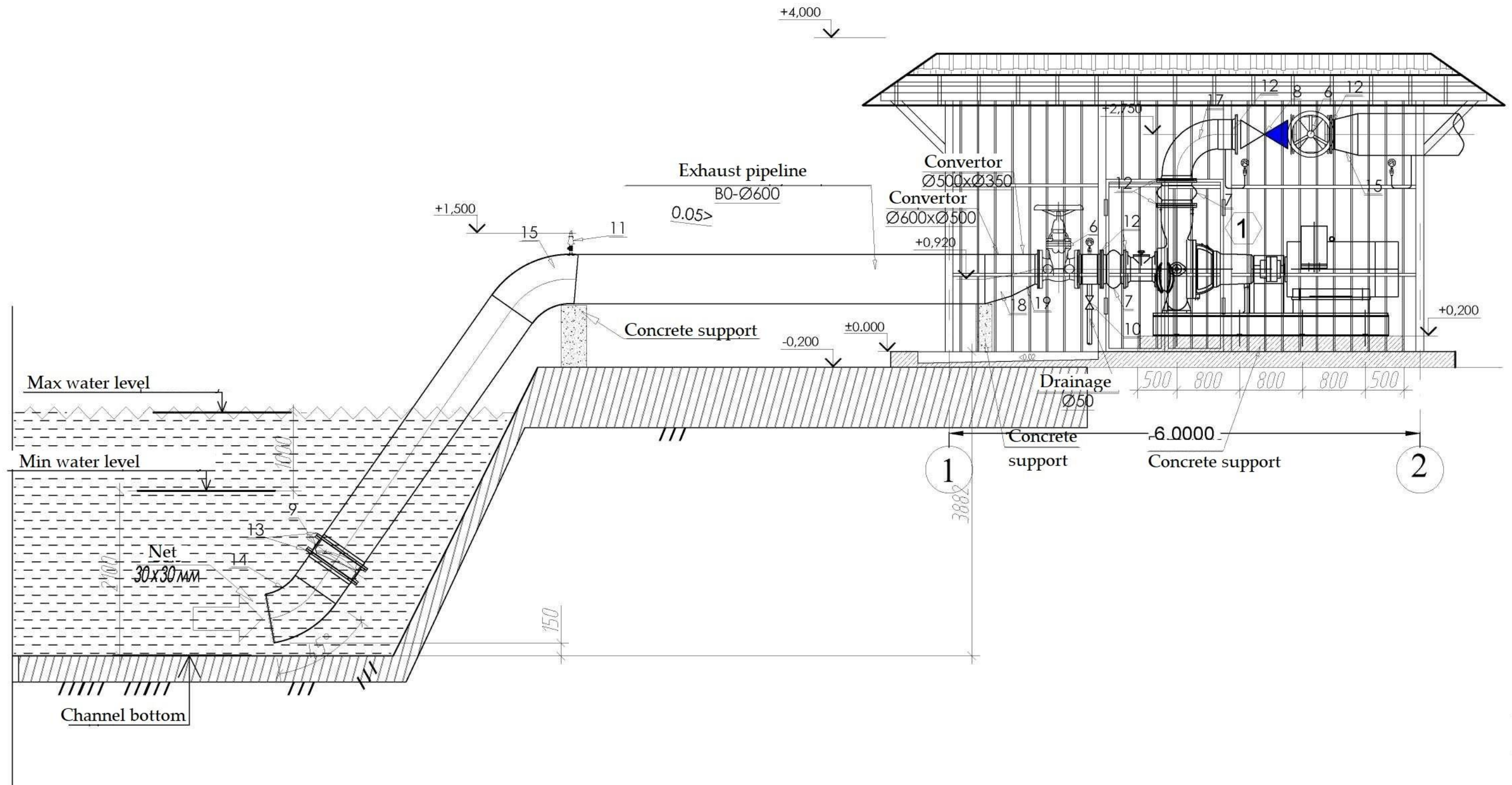
- Overall width: 3500
- Overall height: 6500
- Internal width segments: 875, 1750, 875
- Internal height segments: 428, 1466, 3400, 1493
- Bottom segment: 3200

| SPECIFICATION OF MAIN EQUIPMENT |  |          |      |
|---------------------------------|--|----------|------|
| No<br>of<br>positi<br>on        | Denomination                             | Quantity | Note |
| 1                               | Pressure boosting unit                   | 1worker  |      |
|                                 | Q = 1800.0 m <sup>3</sup> / h, H = 5.0 m |          |      |

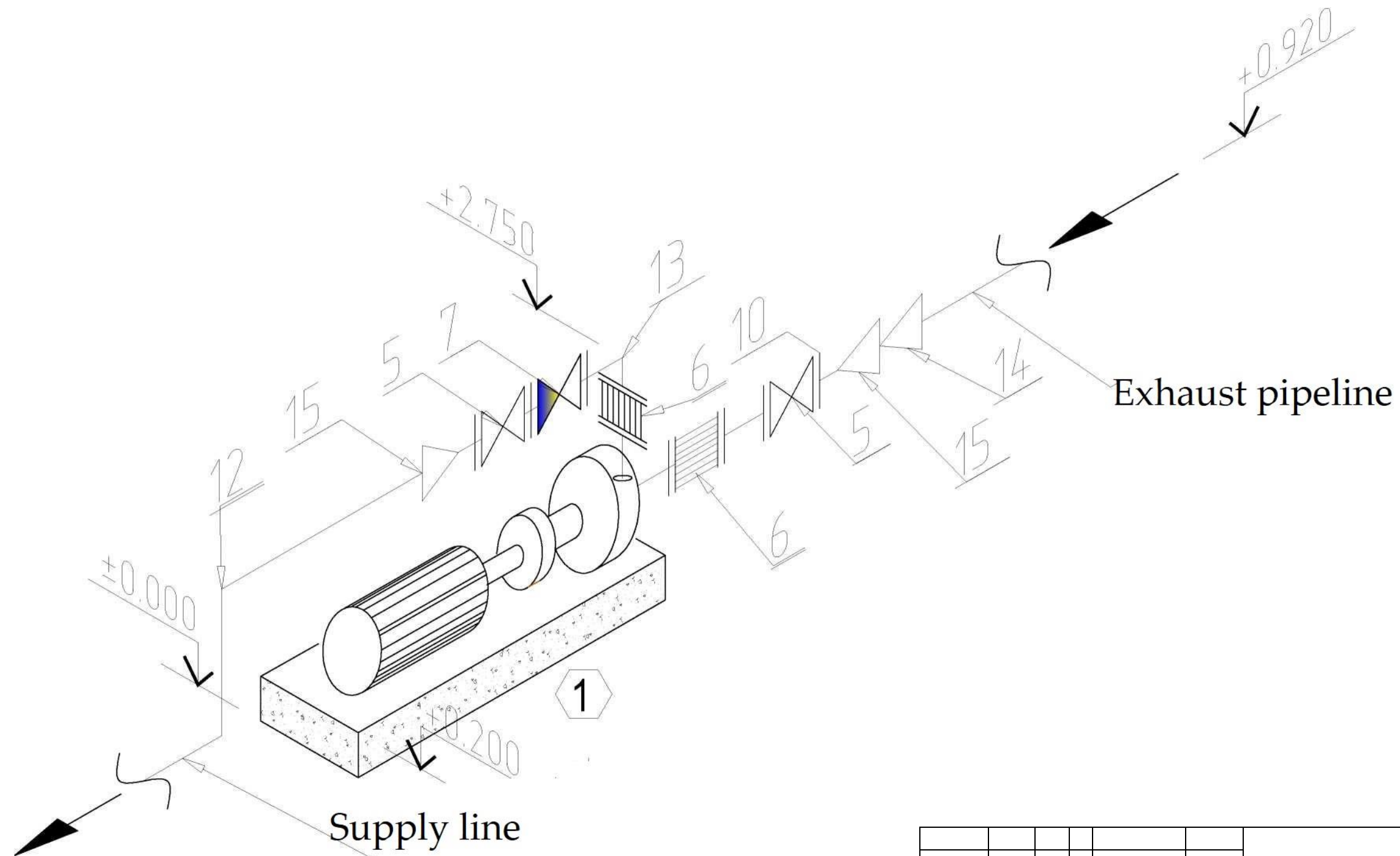


|       |      |       |  |           |      |   |  |       |       |        |
|-------|------|-------|--|-----------|------|---|--|-------|-------|--------|
|       |      |       |  |           |      |   |  |       |       |        |
|       |      |       |  |           |      |   |  |       |  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

# Cut 1-1 M1:100



# Axonometric scheme of PS (package system) networks



|          |       |  |  |            |      |   |       |       |        |
|----------|-------|--|--|------------|------|---|-------|-------|--------|
|          |       |  |  |            |      |   |       |       |        |
|          |       |  |  |            |      |   |       |       |        |
|          |       |  |  |            |      |   |       |       |        |
|          |       |  |  |            |      |   |       |       |        |
| Measure. | Q-ty. |  |  | Signature. | Date |   |       |       |        |
|          |       |  |  |            |      | Pumping house of the 1 <sup>st</sup> 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<br>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 <sup>st</sup> lifting |  |  |       |        |
|          |  |  | Impl.                                 |               |              |               |                    | Stage                                   |  |  |  | Sheet | Sheets |
|          |  |  |                                       |               |              |               |                    |   |  |  |  |       |        |
|          |  |  |                                       |               |              |               |                    |   | Specification of materials and equipment     |  |  |       |        |
|          |  |  |                                       |               |              |               |                    |   |  |  |  |       |        |
|          |  |  |                                       |               |              |               |                    |   |  |  |  |       |        |