

# CONSTRUCTION OF OIL PIPELINE WORKS

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The topic of the development of the oil industry is extremely relevant today. The economy, of course, depends on the state of the mineral and raw material complex, and especially the oil and gas complex. The oil and gas complex today is: 10% of the country's industrial production; 19% of budget revenues; 29% of all exports; 2 largest vertically integrated oil companies (87% of all oil production); 37 medium and small enterprises (9.9% of total oil production); 12 joint ventures with foreign participation. [1]. We can come to the disappointing conclusion that the efficiency of pipelines affects the country's economy. It follows from this that the development and improvement of pipeline construction is the main direction in solving the problem of oil and oil products transportation. Therefore, intensive development in the field of pipeline construction will naturally affect the development of the entire economy of our country in general. The future economy of the country largely depends on the pace of development in the direction of pipeline construction.

Currently, only if oil prices remain high, oil companies have at their disposal the necessary resources for financing investments in fixed capital, i.e. development of pipeline construction. The uniqueness of the situation is that large-scale involvement of direct Western investments in the complex is currently not needed [2].

The technology of construction of main pipelines in difficult conditions based on methods of technical land reclamation includes construction works along highways and access roads, pipeline ballasting, shore fortification works and is intended for the construction of pipeline transitions through water obstacles, in swampy and waterlogged areas. The basis of the technology is the use of local mineral soils, fixed with organic viscous substances, and synthetic materials as building materials. The main technical and economic indicators of the developed technological schemes: consumption of binder for 1 km of pipeline - binder 200 tons; for 1 000 m<sup>2</sup>. coastal fortification - 50 tons, per 1 km. roads - 300 t.

Construction and assembly work must be performed in accordance with the requirements of the working drawings, the work execution project, and the regulatory and technical documentation specified in these documents [3].

The production of the main works is allowed to start after the completion of organizational measures, preparatory works and obtaining written permission from the customer to perform works in the protection zones of main pipelines. It is prohibited to carry out subsequent works in the absence of reports of inspection of previous hidden works. During the execution of works at intersections with existing pipelines, fire, gas-hazardous, and other high-risk works must be carried out with the issuance of a permit for fire works in accordance with the requirements [4].

Quality control of construction and assembly works must be carried out by special services equipped with technical means that ensure the necessary reliability and completeness of control.

Work on lifting and laying the pipeline in the trench should be carried out after the trench has been designed and the quality control of the insulating coating of the insulated pipeline has been carried out. Lowering the pipeline should be carried out after the joints have completely cooled. Before laying the pipeline in the trench, the integrity of the coating should be checked using a spark gap detector (DI74, DEP-1, Holliday detector, etc.).

The laying of the pipeline in the trench should be performed by pipe-laying cranes by lifting the whip, moving it into the trench and laying it freely on the bottom of the trench in accordance with the requirements [5, 6]. The pace of laying the pipeline in different sections is assumed to be 100-200 m per shift.

Laying of the insulated pipeline is carried out in one of two ways:

- in a continuous way, which involves the use of trolley suspensions;
- in a cyclical way, involving the use of soft installation towels of the PM type.

When using cyclic methods, two methods of their implementation are possible:

- the "interception" method, when pipelayers are installed along the way, the pipelayer moves close to the penultimate one, relieving it of the load. He, in turn, moves forward, close to the previous pipelayer. One complete laying cycle ends when all pipelayers take a new position, after which the next cycles are performed in the same sequence until the entire section of the pipeline (whips) is laid in the design position.

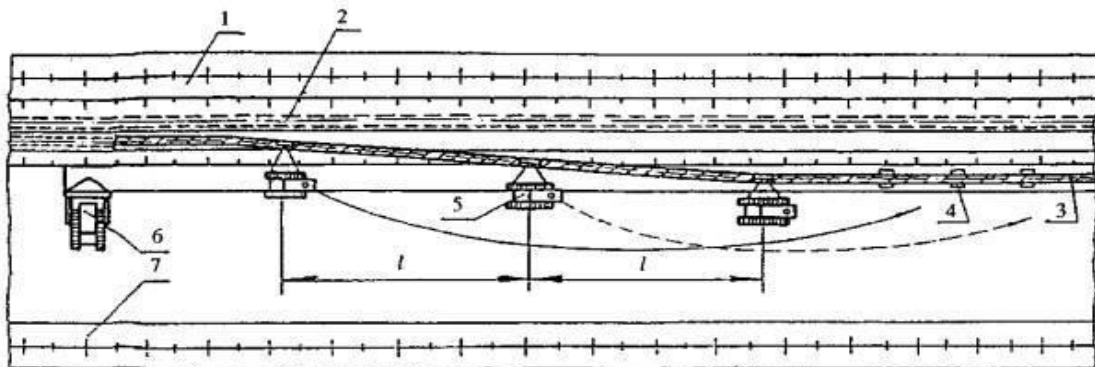


Fig. 1 Arrangement of machines and mechanisms when laying a pipeline in a combined trench

1 - dump of mineral soil; 2 - section of the pipeline to be replaced; 3 – the section of the pipeline is laid again; 4 – inventory beds (earthen bollards); 5 – pipelayer; 6 – bulldozer; 7 - dump of fertile soil layer

CT ballasts are filled with mineral soil in a quarry or on a site near the track. A loose material is used to fill the weights

mineral soil with the size of fractions no more than 50 mm. It is not allowed to mix peat, snow, ice and plant waste (leaves, roots, branches, grass, etc.) with the mineral soil.

To fill the containers, the set of necessary equipment should include a hopper mobile device. Before loading with soil, the bottom of the CT containers should be 30-50 cm higher than the ground to avoid the formation of folds and uneven loading of the containers. Soil is poured into the bunker with an excavator. Weights filled with soil are delivered to the track by motor vehicle and stacked on the edge of a swamp or a flooded area [5, 6].

Delivery of weights to the place of hanging is carried out by a pipelayer. Weighting of the weight on the pipeline is carried out with the help of a traverse and 2 universal slings. Weighting weights on the pipeline is carried out in such a way that they assume a horizontal position, in which the axes of the cylindrical containers of the CT weighting are located parallel to the pipe, and the central seam of the weighting is located along the upper forming pipe [6, 7].

Backfilling of trenches with soil in the locations of CT weights, when the trench is filled with water, should be carried out with a single-bucket excavator. The bulldozer should be used only to complete the filling of the trench in the areas between the ballasts and the formation of the ridge.

After the completion of construction and installation works, the contractor under the control of the commission must carry out cleaning of the pipeline cavity, passing the scraper, hydraulic tests and freeing the pipeline from water. The contractor must obtain a permit in accordance with the established form to perform the specified works.

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