

FROM HISTORY OF CONSTRUCTION OF KERCHENSKY BRIDGE IN DAYS OF THE GREAT PATRIOTIC WAR

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Today one of the major Russian infrastructure projects is construction of the Kerch railway and automobile bridge which has to connect the Caucasian coast with the Republic of Crimea. As the Minister of Transport of the Russian Federation Maxim Sokolov at a meeting with the Russian President Vladimir Putin reported on September 5, 2014, works on construction of the bridge to the Crimea through the Strait of Kerch began in August, 2014 and according to the plan schedule will be complete by December 16, 2018. In this regard actually to consider experience and lessons of construction of a crossing, the bridge through the Strait of Kerch in days of the Great Patriotic War.

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From history we know that Cimmerian Bosphorus (ancient Greeks so called the modern Strait of Kerch, at the end of XVIII – the beginning of the XX centuries the passage also called Taurian, Enikalsky, Kerch-Enikalsky) was famous for abundance of banks and islands through which it was passed successfully into antique times. Cimmerians in the VII–III centuries BC occupied northeast Black Sea Coast, even before emergence Scythians here. About two and a half thousand years ago between the capes Panagia and Tuzla on the bank of the Gulf of Taman there was an Ancient Greek city colony of Korokondam. Since then the sea won 2 kilometers from the coast, and the city appeared at the bottom. In droughty years when the rivers Don and Kuban dumped not enough water to the Sea of Azov, from the Crimea to the Caucasus it was possible even to ford (the Ancient Greek playwright Eskhil called the passage “the cow ford”). There are data that the temporary crossing was organized here still by the Pontic tsar Mitrdat of Vievpator in I BC. owning the cities on both sides of the passage. Its bridge was floating: on the boats standing in water imposed logs on which the cavalry could move.

The first the real project of creation of the bridge through the Strait of Kerch was put forward by the Russian naval officer Vladimir Dmitriyevich Mendeleev in the second half of the XIX century (the son of the great chemist D.I. Mendeleev). Its plan consisted in a dam construction from Pavlovsky’s cape to the spit of Tuzla, and then from it – on Taman. This project was called the bridge from Europe to the Southern Asia. Here once I passed the Great Silk way, the route of the well-known cable line from London to Delhi lay here. At the end of XIX – the beginning of the XX century British managed to lay between the Crimea and the Caucasus on a bottom of the Strait of Kerch a telephone wire for a reliable communication

of the mother country with its colony – India. In 1901 the English government considered even the construction project of a railway line from London to Delhi. At its creation it was planned to build the huge bridge through English Channel and the little the smaller – through the Strait of Kerch. But everything rested as it often happens, for lack of means, and the superproject laid down under cloth.

In 1903 the Russian emperor Nicholas II became interested in idea to build the bridge through the Strait of Kerch. Now design offers on a construction of the bridge were developed by the Russian engineers. But World War I began, then revolution, Civil war burst, they were followed by ruin, and became not to grandiose projects.

Kerchensky Bridge remembered during socialist industrialization. Stalin planned to pave the main railroad from the South of Ukraine from Kherson through the Crimea, further on the bridge through the Strait of Kerch, across Taman Peninsula with an exit to the district of Novorossiysk and then along all Black Sea coast of the Caucasus to Poti. The Soviet plants at that time couldn’t cope with implementation of the purchase order of all yet iron designs, necessary for construction of the huge bridge, therefore they before World War II were ordered in Germany.

War began. In 1942 the German troops took the Crimea, there were fights for the Caucasus. Hitler even at the beginning of war showed interest in construction of a huge railway superhighway to India more than once. But, unlike the British project, German began in the Alps, in Munich. From there steel threads of rails had to stretch to the Crimea, step through the Strait of Kerch to the Caucasus, and then through Gulf States to go to Iran, India. Germans decided to use the metalwork made by request of the USSR for the superbridge in the purposes and began to send from Germany to Kerch.

Interesting fact: the Soviet aircraft noticed unusual activity of Germans on the Kerch Peninsula, but forbade to bomb warehouses – Stalin planned to take the Crimea and to finish the construction of the bridge begun by Germans.

In the memoirs Reich Minister Albert Speer wrote war industry of Hitlerite Germany: “In the spring of 1943 Hitler demanded to begin construction of the five-kilometer bridge for motor and railway transport through the Strait of Kerch. Here we already constructed the suspended road which was started up on June 14, (1943) and delivered every day one thousand tons of freight. It was enough for requirements of defense of the 17th army. However Hitler didn't refuse the plan of break to Persia through the Caucasus. Works were conducted continuously, and concerning them, since winter of 1943, one behind another instructions arrived. Last directive: the bridge through the Strait of Kerch has to be finished till August 1, 1944...” (Speer A. Third Reich from within. Memoirs of a Reich Minister of war industry. 1930–1945. – M.: ЛитРес, 2013. – P. 390).

The German military engineers developed the project of the bridge through the Strait of Kerch which would allow to pave iron and automobile ways from Kerch to the district of Novorossiysk. Real preparatory work began in the early spring of 1943 construction of the railroad from the Crimean station to Chushka Spit. And from Chushka Spit towards the Crimean settlement of Zhukovka preparation for construction of the bridge, over 3,5 kilometers long began.

But soon construction of the bridge was stopped. Situation on the Caucasian front changed. And in the summer of 1943 the German military engineers were compelled to design and construct in the shortest possible time a suspended ropeway through the Strait of Kerch for transfer of the military freights blocked near Taman Peninsula. Some months the ropeway almost smoothly threw every day on 500–800 tons of freight.

In the fall of 1943, before retreat from Taman Peninsula, Hitlerites blew up a ropeway and part of support, but completely didn't manage to destroy a construction. As soon as Taman was released, and on east part of the Crimea the landing is landed, the Soviet engineers were engaged in connection of two coast of the Strait of Kerch. For restoration of partially destroyed road the equipment from one of the industrial ropeways operating at that time in Georgia was used.

In February, 1944 the rope crossing over the Strait of Kerch started over again to work.

Its extent was about five kilometers, and 150 cargo trolleys worked at it. Daily productivity of the Soviet road made about 300 tons. It was the essential help to the 56th army which was on the Crimean coast. On a ropeway arms, ammunition, the food were delivered to the Soviet paratroopers.

During Kerch and Eltingensky operation of 1943. The red Army seized the base to the northeast of Kerch and kept it prior to the Crimean operation of 1944. On a midground between defenders of the base and Hitlerites large reserves of cement and a metalwork – lengthy the shirokopolochnykh the dvutavrovyykh of beams Paine, piles from the tongue and channels were found. Among the taken trophies there were cars of big loading capacity, bulldozers, diesel copras for blockage of piles, mobile power plants, welding machines, etc. They were delivered by Germans for construction of the road bridge through the Strait of Kerch and left at the retreat.

The decision on construction of the railway bridge through the Strait of Kerch was made by the State Committee of Defense by the resolution № 5027 of January 25, 1944. The city of Kerch was freed on April 11, 1944 during the Crimean operation. However design of the bridge crossing, preparatory and construction works on east approach to the bridge and on a platform construction from the Caucasus began even before liberation of Kerch.

Previously two options of the route of transition were considered: Youzhny – from the spit of Tuzla on Kamysh-Burun (the southern suburb of Kerch) and Northern – from Chushka Spit to the settlement Dangerous, to the north of Kerch. On a place the Northern option was chosen. Chushka Spit had length about 16 km, width from 60 to 1 500 m, is separated from the Crimea by the passage from 4,5 to 6 km wide. In its ruslovy part depth of water reached 10 m, from it to coast – 4–6 m. The geology and data on ice drifts in the passage for some tens years were studied. On long-term supervision, ice conditions in the passage were various. In some years of ice was practically not, and in others there was considerable carrying out it from the Sea of Azov to the passage. Complexity of the Strait of Kerch was still that its bottom consisted of mud volcanoes, silt thickness reached 50 meters here. Engineering-geological conditions of transition on materials of researches of 1944 can be divided into three sites. At the west bank throughout about 1 km the dense radical clays (to 13–17 m) covered with a layer of heavy loams, and at a bottom – silty sand superficially lay. The average site (about a half

of length of the bridge crossing) was characterized by a deep bedding of the radical clays covered on tens meters with thickness of weak loams. The site adjacent to east coast, at a deep bedding of radical clays from above was put by dense fine-grained sand and heavy loams.

It should be noted that design decisions were developed and accepted without complete detailed design, on the course of construction works they were approved on a place by the chief engineer of building of Socialist Work I.I by the Hero. Tsurypuy.

For acceleration of opening of train service on transition the main works divided into two turns. Referred blockage of vertical piles of intermediate support, a construction of support of adjustable part, construction of a platform and dam, installation of flying structures, laying of a bridge cloth and way, concreting of metal piles to the first stage; to the second turn – blockage of inclined piles and concreting of grillages of intermediate support, the termination of a dam of the Caucasian coast (a platform zasypka a stone), a construction of 123 ice cutters. The approach construction from the Caucasus from St entered a complex of construction. Hay to the station Caucasus and from the Crimea a site the Crimea – Kerch.

After mine clearing of all route Mostovik began blockage of vertical piles of intermediate support, support of sliding part, construction of a platform and dam. Flying structures from trophy beams and designs from DS steel were mounted on the Crimean coast. Construction of support under adjustable flights took 3 months. Filling of metal piles with concrete and concreting of grillages of intermediate support (about 11 thousand CBM of concrete) made from two concrete plants mounted on sea barges.

Dynamics of construction can be tracked according to operational reports of those of days. The first wooden pile is hammered into a platform of the Caucasian coast on April 24, 1944. The first metal pile is hammered on May 5, the first flying structure is made on May 10. And on November 3, 1944 on the bridge I passed the first train from station the Crimea to station the Caucasus. During this time hammered 2000 wooden and 2341 metal piles, made and mounted about 15 thousand tons of metal designs of flying structures and support, laid more than 5 thousand CBM of concrete, poured out 35 thousand CBM of stone dams. On approaches to the bridge from St. Hay to the station Kerch poured out 400 thousand CBM of a road bed, constructed 21 small artificial constructions, laid 69 km of the main and station ways, prepared and laid more than 40 thousand

CBM of a ballast at way, constructed the communication line 438 long pro-water – km. Efforts of many Crimeans and residents of Krasnodar except the bridge constructed also 18 km of railroad tracks across the Crimea and 46 km across Kuban.

However to winter of 1944 the situation on building considerably became complicated and worsened. The attention to it from the higher organizations weakened, the bridge crossing appeared in the deep back, and military transportations for the front went in other directions. It was reflected and in construction supply with material resources: they went, first of all, to the head, restored after release from the opponent railway directions and objects. Besides strongly weather conditions worsened – storm, disorders on the passage became frequent, came nearer freezing.

The developed conditions didn't allow to conduct successfully work of the second turn, and the bridge was not prepared for an ice drift. Heads of construction to what I.I. Tsurypuy's letter in NKPS of December 15, 1944 testifies well understood it. The chief engineer of construction asked to excite the petition before state credit obligations for allocation in the order of construction of 4 ice breakers in it, U-2 squadrons (9–12 planes with air bombs), 3 artillery divisions with stocks of shells for protection of the bridge against an ice drift. The part of planes and artillery pieces was allocated, and ice breakers to the bridge didn't come.

In this difficult situation builders continued to concrete grillages of support, blockage of inclined piles. But the part of grillages wasn't concreted or had still weak concrete. Began a construction of ice cutters – only five managed to make them. On February 11, 1945, when Yalta (Crimean) conference of heads of states of the anti-Hitlerite coalition Stalin, Churchill, Roosevelt terminated, from the Crimea to the Caucasus on Kerchensky Bridge passed especially protected Government train. And on February 18 from the Sea of Azov under the influence of a wind and a current ice fields 0,5–1 m thick began to approach on February 19–20, 1945 there was an accident. Despite broad actions for a ledoborba, attack from tools of ice-rinks from coast, bombardment of ice from planes and throwing on ice from support by special teams of dining rooms of packages – ice in a number of places of the bridge pressed on support and destroyed 15 intermediate flights which majority of flying structures fell in the sea.

After "ice" accident of the bridge some time the question about its further to destiny was discussed. The government commission recommended to sort the temporary bridge, to

design and build the new. Such options of the bridge – in high level and in low with adjustable flight – were designed in 1945–1946 by Transmostroyekt. On the design course on a place, near the Caucasian coast where strong soil deeply lay, built a skilled caisson. Bridge cost in high option was defined about 2 billion rubles (in the prices operating till 31.12.1949). When the project finished in options reported on Stalin, the last argument of the deputy minister of transport I.D. Gotseridze was: “It, t. Stalin, will be “tsar bridge”, on what that answered: “We overthrew the tsar in 1917” (Transport construction. – 1991. – № 6. – P. 33). On it the idea of the constant bridge crossing through the Strait of Kerch quitted the stage.

Still attempts of construction of the constant bridge through the Strait of Kerch are known. Under the leadership of the famous engineer bridge builder Boris Konstantinov, the author of Krymsky Bridge in Moscow, in the late forties – the beginning of the 1950th design of the bridge through the Strait of Kerch was conducted. Groups of builders were already created, from both sides of the passage the construction organizations which were in time to construct the first bull – one of tens intermediate support settled down. But the question of construction was taken out on the Politburo. After the report of the author of the project Stalin asked, will cost how many construction of the bridge and in what construction of a ferry which project was submitted as alternative option will manage. Of course, the cost of a crossing was considerably smaller, and Stalin chose this option. The crossing which works and still, became operational in 1953, and the powerful first bull of not built bridge still sticks out in water near the Crimean coast.

The following attempt was made in the mid-seventies by, it was connected with aspiration of fishermen to improve ecology of the Sea of Azov. It is known that Azov before war gave 30% of all-Union production of valuable fish and caviar. However after reduction almost for 40% of receipt to Azov of fresh waters of Don and Kuban because of introduction of Volga-Don Canal and the Kuban reservoir of a condition for fish breeding in Azov considerably worsened. Water in it became much more solony, and the Azov fish who didn't get used to it simply was lost. It was decided that to construct something in the passage without destiny of the Sea of Azov – this crime.

By request “Azcherryby” Gidroproyekt design institute of S.Ya. Zhuk executed the first stage of project works of the Kerch water-engineering system which limited access of salty

Black Sea water to Azov. The project was agreed with the Crimean regional executive committee and with the government Ukrainian the Soviet Socialist Republic. However the last word, as always, was beyond Moscow. The project was studied in the government and in the State Planning Committee of the USSR, its settlement cost made 480 million rubles. However in parallel the same expensive project of a protective dike of Leningrad which was defended actively by the member of the Politburo V. Romanov came to the State Planning Committee.

The project of the Kerch water-engineering system sustained all examinations, but two such constructions at the same time the country wasn't able to afford. In the Politburo of CPSU it was preferred as the Leningrad dam. The project of the Kerch water-engineering system was postponed “temporarily”.

Remembered the project of the bridge in 1993 when the Crimea appeared as a part of Ukraine. In 2000–2002 the project of tunnel transition through the Strait of Kerch (like a tunnel near English Channel) offered by the CEO of ESPOO scientific and production firm (“Operation and Building of Underground Objects”) Doctor of Engineering Nikolay Glukhov was actively discussed. According to this scheme this tunnel could become an important link of the Great silk way from China to Europe.

At the end of 2013, during visit of the president of Ukraine Yanukovich to Moscow, an issue of construction of the bridge it was finally agreed in a package with the major strategic decisions on providing financial aid to Ukraine. January 30, 2014. The Cabinet of Ministers of Ukraine declared that construction of the “Euroasian” crossing will begin in 2016. However all these plans weren't fated to come true. The Ukrainian Maidan of February, 2014 led to opposition of the Crimea, Donetsk, Lugansk with the new Kiev power which made revolution. On March 18, 2014 thanks to the historical solution of the people of the Crimea the peninsula returned to structure of the Russian Federation. And already on March 19, 2014 the President of Russia V.V. Putin set the task to build Kerchensky Bridge in automobile and railway options for the ministry of transport.

Thus, in days of the Great Patriotic War there was an urgent need of construction of Kerchensky Bridge and this project was realized in 1943–1945, but in a peace time managed a ferry. Today, when the Crimea reunited with Russia and journey through the territory of Ukraine became remote, again there was actual a question of construction of modern Kerchensky Bridge.