

RUNWAY-3 CULVERTS SHEREMETYEVO AIRPORT, MOSCOW REGION

HYDRAULIC WORKS, EROSION CONTROL

Products: Terramesh[®] system, Reno mattresses[®], ParaGrid[®] geogrid

Site Description

Sheremetyevo is the largest Russian airport in terms of traffic and airport area. Current Sheremetyevo service rate is 55 takeoff and landing operations per hour (aircraft/h). At the same time, the existing two runways are interdependent and cannot be used simultaneously.

Since 2011, a third runway has been under construction north of Sheremetyevo. The Runway-3 commissioning will increase the runway service rate (number of takeoff and landing operations per hour) from the current 55 to 90 aircraft/h, almost doubling the airport runway service rate.

The commissioning of an independent Runway-3 will ensure the full-scale development of the national airline carrier Aeroflot and other airline carriers. In addition, the Sheremetyevo Runway-3 commissioning will increase the attractiveness of Moscow as an international transit hub and will contribute to the realization of the transit potential of Russia as a whole.

Problem

Within the project for the Sheremetyevo Runway-3 construction, an architectural solution that is not typical for Russia is being implemented – at the intersection of the existing Sheremetyevo highway with a taxiway, a bridge crossing is designed for aircraft taxiing. The bridge is 60 m width in accordance with the International Civil Aviation Organization recommendations.

Client:

FSUE "ADMINISTRATION OF CIVIL AIRPORTS"

Designer:

FSUE GPI and NII GA "AEROPROEKT"

General Contractor:

TRANSSTROYMEKHANIZATSIYA LLC

Consultant:

MACCAFERRI GABIONS CIS LLC

Applied products:

TERRAMESH[®] SYSTEM ELEMENTS – 1,541 PCS.
RENO MATTRESSES[®] PVC – 4,027 PCS.
PARAGRID[®] GEOGRID – 32,760 M².

Construction period:

START OF CONSTRUCTION – NOVEMBER 2014
END OF CONSTRUCTION – JUNE 2016



Runway 3 project in Sheremetyevo airport



River bed reinforcement with Reno mattresses[®]



Laying of ParaGrid[®] geo-grid under bridge



Erosion protection under the bridge and bed of Klyazma river

In addition to the highway, the Klyazma River bed crosses the designed taxiway. Therefore, during the implementation of the runway-3 project, the underbridge space and the river bed engineering protection section has been included.

The project provided for erosion protection of the underbridge area, as well as the straightening and transfer of the Klyazma river bed.

Solution

The specialists of the design institute of DarVodgeo JSC in cooperation with the engineers of MACCAFERRI GABIONS CIS, LLC, developed a technical solution providing for the erosion protection of the underbridge space and the river bed using the Terramesh[®] soil reinforcement system and Reno mattresses[®].

Reno mattresses[®] were used as technical solution for independent underbridge slopes reinforcement structure. The Terramesh soil reinforcement system strengthened the riverside, channeling the river bed within allotment red lines. The engineers of both enterprises performed all the necessary calculations – both hydraulic and stability calculations of retaining walls with soil reinforcement.

As soil reinforcement structure along the Klyazma bed, the high-strength ParaGrid[®] geogrid with a 100 kN/m tensile strength was used. Due to its high tensile strength characteristics, the geogrid reduces the differential setting and accelerates the consolidation of the ground base. The geogrid is resistant to mechanical damage, its textured surface provides good coupling of material with soil. The service life of such geogrid is 120 years. All of the above characteristics provide high reliability of soil reinforcement structure.



Reinforcement of slopes under Runway 3 with Reno mattresses[®]



Reinforced ground system Terramesh[®] along Klyazma river bed

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