

### BAIKAL P258 HIGHWAY SECTION RECONSTRUCTION

KM 464+550 - KM 470+590, Settlement VOZNESENOVKA, REPUBLIC OF BURYATIA

#### RETAINING WALLS & SOIL REINFORCEMENT

**Products:** Gabions, Reno mattresses<sup>®</sup>, Terramesh<sup>®</sup> system

##### Site Description

The P258 Baikal highway is a federal highway Irkutsk – Ulan-Ude – Chita and passes through the territory of Irkutsk region, Republic of Buryatia and the Zabaykalsky Krai. The length of the Baikal highway is about 1,100 km.

The highway provides economic and administrative ties not only in Eastern Siberia (Irkutsk and Chita regions, Republic of Buryatia), but also between Chelyabinsk, Kurgan, Omsk, Kemerovo, Tomsk, Novosibirsk regions, Krasnoyarsk Krai, and for the Russian Federation as a whole.

The length of Buryatia's section of P258 Baikal highway is 390 km. The highway section km 464+550 – 470+590 passes the Tarbagatai district, including settlement Voznesenovka.

##### Problem

The section km 464+550 – 470+590 reconstruction project should take into account a number of important features:

1. Confined construction area. The highway passes in the corridor between Selenga riverside and single-track railway Moscow – Vladivostok.
2. Harsh environmental conditions. Winter in the Republic of Buryatia is cold and long. January average air temperature ranges from -17 ° to -31.7 °C. Such weather conditions can impact highway structures and delay the construction.



Laying of Reno mattresses<sup>®</sup> in flooded area



Construction of gravity retaining wall



Gabion structures along highway

Customer:

FKU UPRDOR YUZHNY BAIKAL

Designer:

SMETA PLUS LLC

General Contractor:

DORSTROYSERVIS LLC

Consultant:

MACCAFERRI GABIONS CIS LLC

Applied products:

GABIONS 2 x 1 x 1 PVC – 2,639 PCS.  
RENO MATTRESSES<sup>®</sup> 3 x 2 x 0.23 PVC – 5,900 PCS.

Construction period:

NOVEMBER 2016 - MARCH 2019



Therefore, to fit the highway in the area, it was necessary to develop a special technical solution providing for the possibility of installation in the winter season, at low temperatures.

## Solution

The Maccaferri specialists proposed the optimal solution for stabilizing the subgrade slopes using soil reinforcement technologies and the construction of mass gravity retaining walls.

For the section where the road passes directly along the steep sandy riverside which is subject to erosion, the Terramesh® soil reinforcement system was provided up to 7 m high.

The embankment slopes of Selenga river flooding area were reinforced with Reno mattresses®. And with the maximum proximity to the railway, for the stability of the highway cutting slope and railway subgrade, the 2–4 m mass gravity retaining walls with box-shaped gabions were provided.

Terramesh® soil reinforcement system structures are made of high-quality galvanized steel wire with an additional polymer coating – PVC. This design allows to resist the effects of aggressive environments and provides the structure long service life of more than 75 years.

To maximize the service life of mass gravity retaining walls, box-shaped gabions were used with a similar coating.



Mobile heated shed for gabion structures

To avoid the negative impact of low temperatures on the PVC coating of mesh structures during the installation, Maccaferri specialists suggested the using of special mobile heated sheds.

Mobile heated sheds were made directly at the construction site from improvised materials. The use of these portable structures made it possible to install gabions at low temperatures, excluding damage to the polymer coating. Thanks to this the work was carried out year-round.

The total length of constructed retaining walls was 1,480 meters.



Completed Terramesh® reinforced ground system along Selenga river

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