

**SOLUTIONS TO IMPROVE LAND SLIP  
IN THE SADOVA VECHE AREA (CARAS-SEVERIN COUNTY)**

**SOLUȚII DE AMENAJARE A ALUNECĂRII DE TEREN  
DIN PERIMETRUL LOCALITĂȚII SADOVA VECHE  
(JUDEȚUL CARAȘ-SEVERIN)**

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**Abstract:** *In this paper are presented the conditions that led to the land slip from the Sadova-Veche locality, Caraș-Severin County, the effects of this phenomenon and the proposed improving solutions.*

**Rezumat:** *În această lucrare sunt prezentate condițiile în care s-a produs alunecarea de teren din zona localității Sadova Veche, jud. Timiș, efectele produse de aceasta asupra localității și soluțiile de amenajare propuse*

**Key words:** *land slip, alluviums, overflow, versant, stone tail board, terrace, becoming overgrown with grass.*

**Cuvinte cheie:** *alunecare de teren, aluviuni, deversare, versant, prag din piatră, terasă, înierbare.*

### **INTRODUCTION**

The area where the perimeter, who will be affected by works involving fighting soil erosion, is located in the north-west side of the Caraș-Severin County, in the range of Slatina Timiș commune at around 30 km distance from Caransebeș municipality on the European road E70 Caransebeș – Orșova.

The surface affected by the land slip is located in the range of Sadova Veche locality from the Timiș Hydrographic Basin.

The amelioration perimeter surface is about 34 ha. From this effectively affected by land falls are 3.6 ha, that are covered with meadow from the communal locality pasture and is a property of the Slatina Timiș City Hall.

Following the severe precipitations from the 2005 spring (1199mm) and from the 2006 spring and also due to the versant leakages in the neighbourhood of Sadova – Veche locality, took place a landfall on the western versant of the Gornuțel Hill, on a surface of 3.6 ha.

The waters from precipitations on the affected versant are tacked by a valley which overflows on a street from Sadova-Veche locality flooding the houses on that street over 380m length.

Together with the water flow are carried high quantities of alluviums, coming from the land slip that are stored on the street and in the yards from the houses located on that street.

### **MATERIAL AND METHOD**

To establish the improvements solutions were used climatic, pedological, topographical and geological data.

To characterize the studied area were used climatically data from the meteorological station Caransebeș.

The medium monthly temperature for the year 2004 is between -2.7°C (for the month of January) and 20.2°C (the month August).

The precipitations in the year 2004 have reached a total value of 741,1mm with a maximum of 141.2mm for the month November.

In the year 2005 the medium monthly temperature was between -2.6°C (the month February) and 20.8°C (the month July), and the precipitations have reached the total value of 1199.2 mm with a maximum of 200.6 mm in the month of April.

Pedologically on the studied surface dominates the luvisols, clay soils, with an impermeable layer at small depth fact that favours the land slip phenomenon.

Hydrologically the area affected by land falls is characterized by the presence in small depth of the phreatic water coming from the coastal springs that are in this area.

The general arrangement scheme of the amelioration perimeter is represented on a plan in scale 1:5000 (fig. 1) and must resolve the following problems:

- Reducing until the tolerated limits of the consequences from floods that have affected this terrain and their rehabilitation on the shortest possible time;
- Clearing the ways of surface erosion intensifications as a result from the versant leakages;
- Settling the land slip and conducting the surface waters flow out of the area affected by land falls.

The general improving scheme covers (fig. 1):

- Flatten the improved surfaced to assure the water flow towards emissary to avoid their stagnation;
- Collecting and discharging the excess waters from a net of outlets and evacuations, coastal channels;
- *Robinia sopophora* and *Pynus sp.* plantations;
- Sowings;
- Works necessary to improve the access road net for the gear and re-establishing the ditch drains;

#### **TEHNICAL SOLUTIONS FOR THE IMPROVEMENT**

The landslip from the studied area is a wet medium depth landslip.

For the landslip stabilisation offset works, catchments works, leakage conduction of the water that are affect by the landslip, cliffs and their slopes overgrown with grass works, and *Rubinia sopophora* and *Pynus sp.* plantations are required

In the downstream of the valley, that collected the landslip water's, a stone tail board is necessary to be built-up for the water speed attenuation and for the alluviums retention (that are transported from the upstream of the landslip) and for the valley water flow deviation to the back of the house's garden of the affected street.

The necessary works to be elaborate must take into consideration the land slips stabilisation and the valley water flow deviation from the flank to the back of the house's garden and are presented in figure 1:

- The landslip levelling by 10 grassed terraces construction (T1-T10) that is 7 m width and 3 m altitude, with head gradient platform and to the longitudinal axes orientation.
- A water collecting channel, for the water that result from the improvement area achieves, whose line to be throw the back of the house's garden because the water that

come to the up down not flooded again the street and the street's households. We propose to execute this channel with a trapezoidal section, with a rock riprap coated for the erosion avoidance, with next characteristics:  $h=1.3\text{m}$ ,  $b=0.5\text{m}$ ,  $m=1.5$ .

- Two pipe culvert executions with 1000 mm diameter and 10 m length by prefabricate tube, with built up tympanum on the scene execution.
- Two outlets channel execution (DB1-DB2) to the interception channel take over, from stone, with next characteristics:  $h=0.7\text{m}$ ,  $b=1\text{m}$ ,  $m=1.5$ ,  $L=90\text{m}$ .
- A coast channel execution (CC1) to up down waters evacuation in other valley, that have next characteristics:  $h=1.3\text{m}$ ,  $b=0.5\text{m}$ ,  $m=1.5$ .
- An interception channels execution at the base of each terrace that has next characteristics:  $h=0.6\text{m}$ ,  $b=0.5\text{m}$ ,  $m=1.5$ .
- A drain channels execution, for water retention and conduction in the channel.
- A tail board execution that take up the water from the landslip and that has, in downstream, a slopping wall disperser.
- A flag channel execution, for water take up, from the tail board till the water collecting channel.
- On the valley, a two break-up with 0.8 m altitude execution.
- An approach road execution, with 450 m length and 4 m width, from compacted soil.
- The terraces and the bank slope will plant with *Robinia sopophora* and *Pynus sp.*
- A prefabricates bridge building, with a metallic grid, that has next characteristics:  $L=10\text{m}$ ,  $h=0.8\text{m}$ ,  $l=1\text{m}$ .

## CONCLUSIONS

The improvement proposed area present a major risk for the houses and the lands that are situated downstream the landslip.

The proposed solutions for the improvement of the area have a medium hardness degree and it use known solution.

The works can be realised in a relative short time (5 or 6 month).

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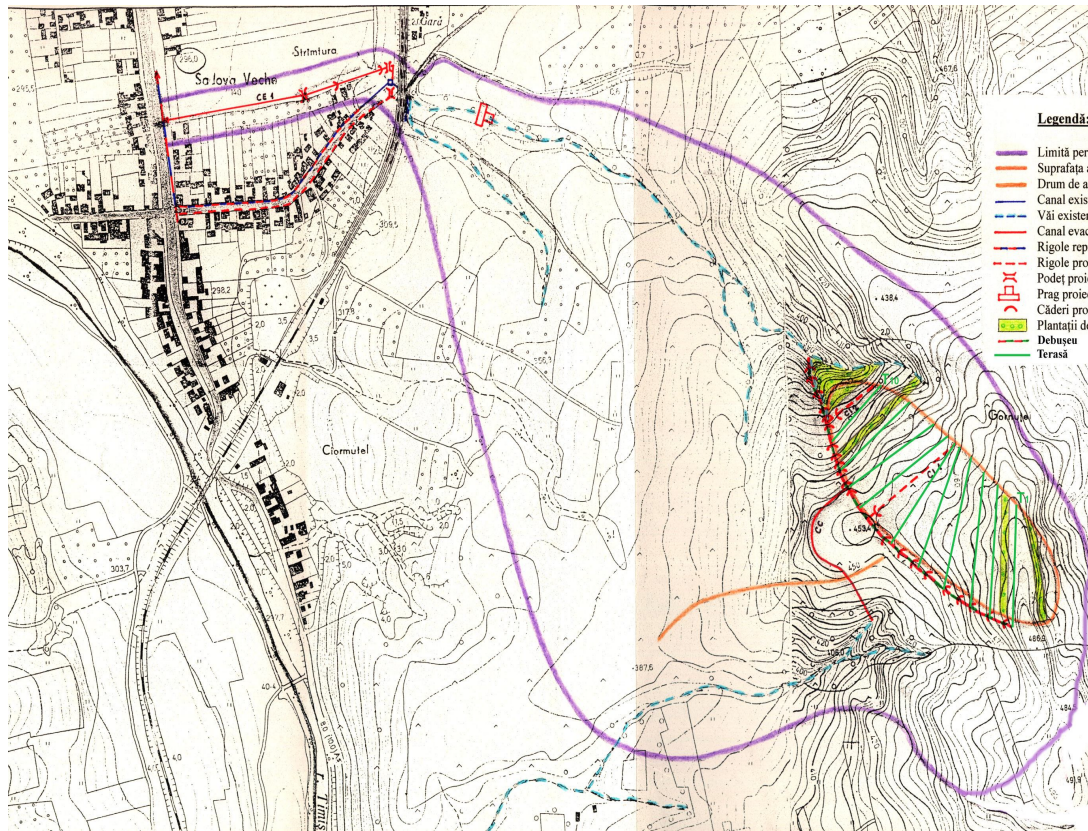


Figure.1. The general arrangement scheme of the amelioration perimeter