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Vincent Segel, Mathieu Schmitt, Edith Michel-Villaz, Thierry Eme, Stéphane Roudnitska, et al.. Avalanche protection dam of Cialancier in Saint Etienne de Tinée: from 2D digital modeling to the start of the onsite work. International Snow Science Workshop (ISSW), Oct 2013, Grenoble – Chamonix Mont-Blanc, France. p. 909 - p. 911. <hal-00951832>

HAL Id: hal-00951832

<https://hal.science/hal-00951832v1>

Submitted on 25 Feb 2014

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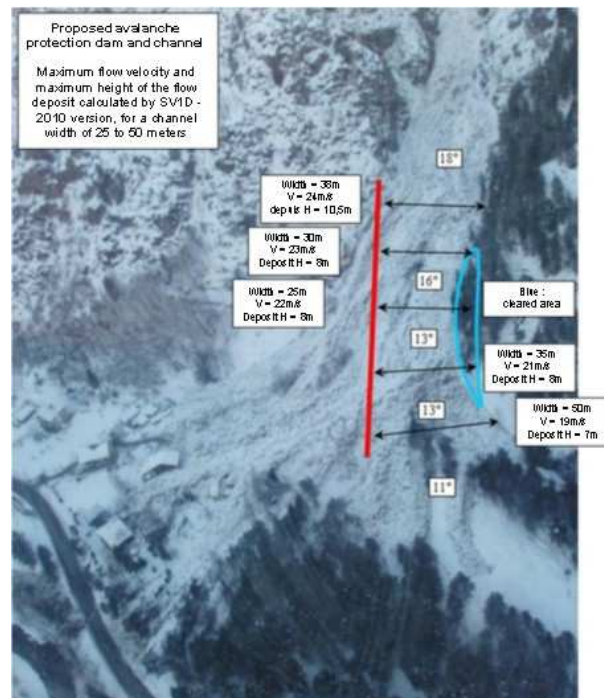
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Avalanche protection dam of Cialancier in Saint Etienne de Tinée : From 2D digital modeling to the start of the onsite work

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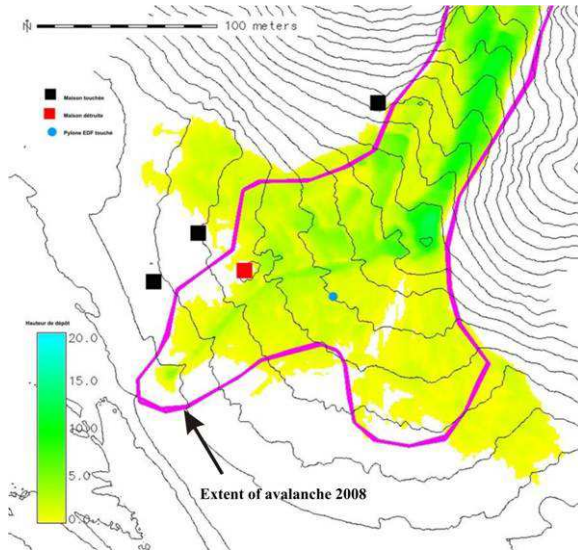
ABSTRACT : On 16 December 2008 at 11.15 am, a large scale avalanche started in the upper watershed of the Fougeret couloir and ended its course in the hamlet of Cialancier, in the municipality of Saint Etienne de Tinée. A house was destroyed and two others were damaged. Luckily, there were no casualties. This article describes how to design and build an avalanche protection dam.

KEYWORDS Avalanche protection – Modeling – Work



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Preliminary design of an avalanche protection dam using Saint Venant 1D software and basic calculations

Result of *Saint Venant 2D* modeling, similar to the avalanche of December 2008 on Digital Terrain Model (DTM, 1 meter pixel size), alongside with the proposed work, $H_{max} = 14$ m. In pink is highlighted the real extent of the avalanche of December 2008.

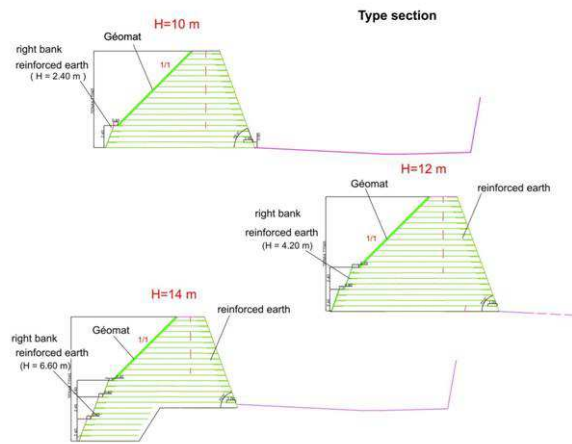
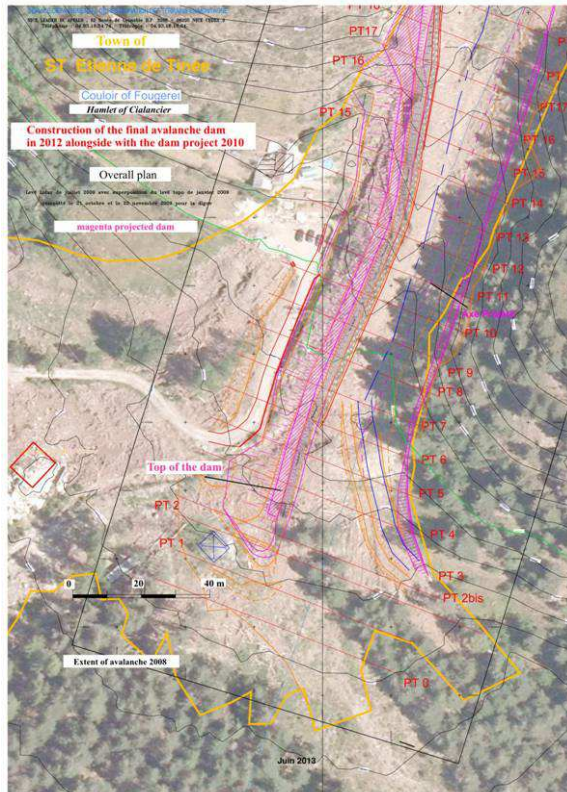


This result shows that:

- The flow of the reference event is diverted mainly to the left side
- Less than 1 m thick overflow occurs at the upstream part of the dam

Accordingly, it is proposed to increase the height of the dam by 14m

Result of *Saint Venant 2D* modeling, similar to the avalanche of December 2008 on Digital Terrain Model (DTM, 1 meter pixel size), alongside with the proposed work, $H_{max} = 12$ m. In pink is highlighted the real extent of the avalanche of December 2008

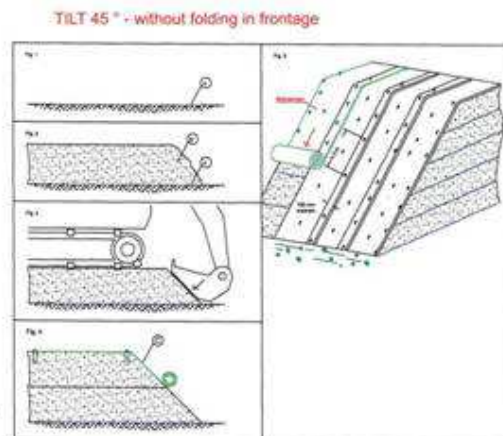
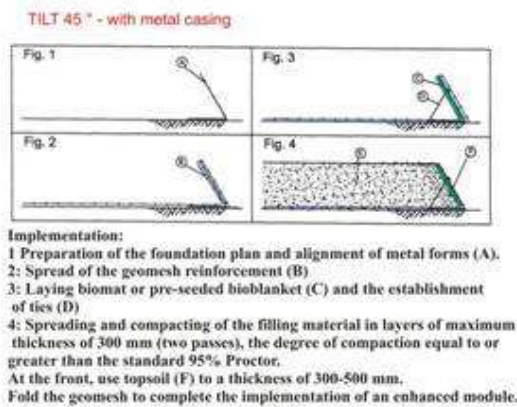


Overview of the dam after revegetation by hydroseeding – June 2013



After the creation of a Digital Terrain Model (DTM) based on a Lidar survey done by helicopter, iterative simulations of the avalanche of reference have been done using the *Saint Venant 2D* software *Irstea*, based on volumes mobilized and the coefficients of friction, matching a flow velocity, extension and thickness of deposits consistent with those observed or measured in December 2008

Building scheme



At the front, well compacted topsoil must be used about 300 mm thick
 4: Anchoring geomat (C) at the edge using U-shaped pins. Unwinding of geomat
 5: To ensure uniform protection of the facade against any erosion, provide an overlap between the strips of geomat least 10 cm. Webs will be fixed by U-shaped pins. Add pins at mid-width of the strips to ensure good contact between bank and geomat.