

~ GEOTHERMAL SWIMMING POOLS ~ OF THE GOTTHARD BASE TUNNEL

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Prof. Angelo Bucci

Assistants: Karina Hüssner and Ciro Miguel



PREMISE

Founding elements

Mountains and lakes are constants in the Swiss landscape. There are two types of construction corresponding to them: tunnels and bridges.

North-south axis

The modern transposition of the Gotthard Mountain began in the 16th century with the construction of a stone bridge over the Schöllenen gorge. Since then, the Gotthard pass has been continually reconfigured in a history of constant struggle to overcome the massif.

With a route of 57 km, the construction of the Gotthard Base Tunnel is expected to be finished in 2016. It is an emblematic step representing a definitive north-south connection through the Alps.

The new Gotthard pass, key project for the AlpTransit railroad network, demands speed and efficiency. It compresses time and space; it shortens huge distances, approximates places, connects cities and, in this sense, tends to cancel the perception of the whole route.

Geothermal potential / Environmental impact

The great geothermal potential of the 57km long and 1000m deep Gotthard base tunnel produces an important side effect: the tunnel is a source of hot water.

From an energy point of view, the hot water is sufficient to warm a great number of buildings located near the tunnel portals. Several studies are being carried out to exploit this possibility.

Environmentally, this source of hot water is a problem. In order to reduce its environmental impact, these warm waters must be retained and cooled down before being discharged into rivers and lakes. How to answer this question?

Infra-Structure

The cooling and retaining water devices at the tunnel portals compose an obligatory infrastructure to mitigate the environmental effects of such massive tunnel construction. This mechanism, however, does not compete with the possible geothermal use for heating nearby houses and buildings. It rather allies to it. Actually, such devices balance the whole system according to volume and temperature variation of the outflow water in each season.

Architecture

Hot water tanks placed in sequence in order to decrease the water temperature are in direct relation with a subject that follows architectural history since the roman thermal baths [caldarium, tepidarium, frigidarium]. More than that, the baths are extremely well elaborated and studied topic within the Swiss context. [Stoffler, Johannes, ETHZ. *Modernism for the People: Swimming Pool Landscapes in Switzerland*. To be published in: *Modernism and Landscape Architecture*]

Architecture and Infrastructure

The environmental effects of the Gotthard tunnel waters suggest an engagement between architecture and infrastructure, merging environmental conscience and technique with the program of leisure and public baths in Switzerland. Swimming pools or thermal baths will be the new portals of the Gotthard Pass.

Architecture and landscape

Site and program approximate architectural design elements to the surrounding landscape.

In this case, the mountain and the lake are the genesis and final destiny of the projects

Again, stone and water are the raw and symbolic materials for the projects we invite you to do.

STUDIO WORK PROPOSAL

- Base material preparation
- Study of reference projects (thematic, swimming pools and thermal baths; and circumstantial, similar site conditions and formal language)

- Ticino visit.

A. Projects directly related to the studio:

[1] Gotthard's south portal. [2] Monteceneri [3] San Gotthard Pass [4] La Claustra Hotel

B. Ticino architectural references:

[5] Tunnel portals by Rino Tami [6] Young architect's work from Ticino [7] Swimming Pools, Lidos and Thermal Baths [Centro visitatori AlpTransit, Lido Locarno, Centro Sportivo Tenero, Centro Sportivo Bellinzona, Lido Lugano, Lido Bissone, Piscina Comunale Mendrisio, Piscina Comunale Chiasso]

REFERENCES

Modernism for the People: Swimming Pool Landscapes in Switzerland

Johannes Stoffler

To be published in: *Modernism and Landscape Architecture*

1890-1940. Studies in the History of Art. National Gallery of Art, Washington D.C.

Geothermal use of tunnel waters – a Swiss specialty

International Geothermal Conference, Reykjavík, Sept. 2003 Session #5

L. Rybach [1], J. Wilhelm [2], H. Gorhan [3]

1) Institute of Geophysics ETH Zurich

2) Consulting Engineer, Pully

3) Electrowatt – Ekono AG, Zurich

Porta Alpina

Gion Caminada / studio ETHZ [2005]