



Structural design and construction of the Carouge-Bachet underground railway station in Switzerland

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Summary

This paper presents the design and construction of the Carouge-Bachet underground railway station in Switzerland. This design was largely determined by the local environmental constraints regarding the existing buildings and highways in the surroundings. The balance between the different construction techniques at each construction phase lead to progressive structural configurations affecting the behavior of the elements in time. The 33x32x21 m cube-shape station is built from top to bottom by using reinforced concrete diaphragm walls connected to different floors in successive stages that include the use of a pre-cambered steel-concrete beam (Preflex, normally used in bridge engineering) to take the lateral earth pressure and the use of vertical and horizontal temporary supports to liberate the space needed for the machines excavating the Pinchat Tunnel that starts from the station. This paper discusses the background of the design of the underground station.

Keywords: Underground station, railway, reinforced concrete, diaphragm walls, preflex beam.

1. Introduction

1.1 Explosion of mobility needs

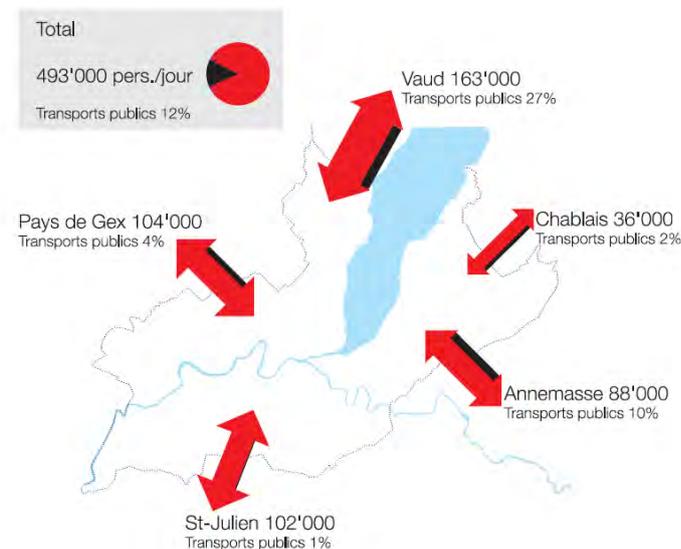


Fig. 1: Cross border flows in the franco-valdo-genevoise region.

The franco-valdo-genevoise region is home to 900'000 inhabitants from two Swiss cantons (Geneva and Vaud) and from two French regions (Haute-Savoie and Ain) [1].

This region employs 400'000 people and by the year 2030, 100'000 extra jobs will be created with the increase of 200'000 inhabitants. In this context, the study of engineering solutions according to the future needs in terms of mobility will guarantee his correct development.