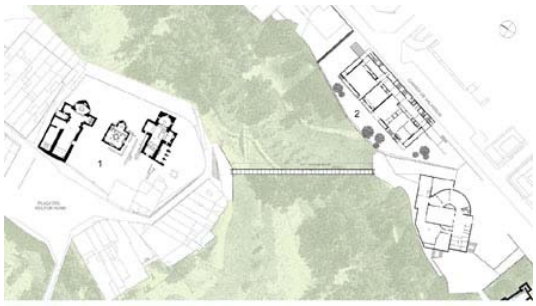
SANT PERE DE TERRASSA FOOTBRIDGE

Manuel REVENTÓS
Civil Engineer
Enginyeria Reventós, SL
Barcelona, CAT, SPAIN

Picture 1.
General view.

1. Antecedent and motivation

In the Vallparadís Park, placed in Terrassa, different millenari cultures come together, being for 2.700 years a sacred place in which a historical register of human life can be found.This park was formed by a principal creek, the Vallparadis Creek, which appeared due to the junction of two other creeks, "les Bruixes" Creek and Moner Creek. Between the "les Bruixes" Creek and the Moner Creek close to the junction, we can find a monumental set consisting of the romanesque churches of Sant Pere de Terrassa. Since s.XVI the access to the churches from the town centre has being solved by the Sant Pere Bridge, an excellent collection of stone arches, that jumps over "les Bruixes" Creek .



In 1995 the City Council summoned a competition of ideas with a basic purpose: to define an urbanistic criterion for the park and its surroundings. After having won the competition we proposed placing the museum in the other side of the Moner Creek. That fact create a new necessity: a pedestrian connection over the creek, which futhermore of becoming a new connection of the city, let enjoy the user of wonderful sights of the park.

Figure 1. Situation.

2. Stress ribbons. Origin, modern conception and recent implementations

The origin of the stress ribbons becomes lost in the mists of time. The first news about suspension bridges integrating liana and platform come from the east slope of the Himalayas, where the River Yang-Tzé and the River Mekong rise, in the Chinese Sichuan and Yunnan. Probably in the First Century and certainly from the Seventh Century on there were already chain bridges like the still existing Tiehong Bridge in Shigu (Stone Drum Town), or the River Dadu, that was in 1705 the first bridge in the world with more than 100 m.

Picture 2. Tiehong Bridge. Shigu. China

The modern conception of stress ribbons comes from an idea contest in 1961 to build a bridge over the Bosfor in Istanbul. There, U. Finsterwalder proposed a solution of three 400 m spans. The proposal did not win, but a few years later some stress ribbonswere built, standing out from this first period are the Lignon-Löex, Ginebra, 136 m (1971) and the Holderbak's, also in Switzerland, 216 m (1964).The blast of technology wouldn't come until well into the 80s, when J. Strasky completed the industrialized procedures and started to build his collection of stress ribbons in the Czech Republic culminated at 1990 with the Redding's (California) over the River Sacramento, 127 m. From this moment on, about 15 stress ribbons have been constructed. Today the bigger ones are Yumetsuri Bashi in Japan, 148 m, and in Plovdiv in Bulgaria, 150 m.

Picture 3 . The footbridge between the Vallparadís's trees

3. Determining factors and description

The main determining factors were: to respect the Park and its grove, with plane trees that reach the 40 m high and to carry out the Accessibility Code of Catalonia. That determaining factor is difficult to solve moreover if we consider that the two bridge startings have different levels. A spand band solves with a high mark the aspect of being respectful with the Park and its sourrondings. Any tree have been cut down but a branch. The spand band geometry with a relation sag/span closed to 1/50 is near the limit established by the Accessibility Code: between 8% and 10% in the 4 m of the starting. Other determining factors were: the footbridge mixed conception –on the one hand, it had to be intended as a urban passageway over the creek, and on the other, it had to be intended as a "cultural" connection passage between the monumental whole and the future "Church Museum", located on the other side of the torrent- and (this circumstance is strictly structural) the low quality of the shallow layers of the ground.

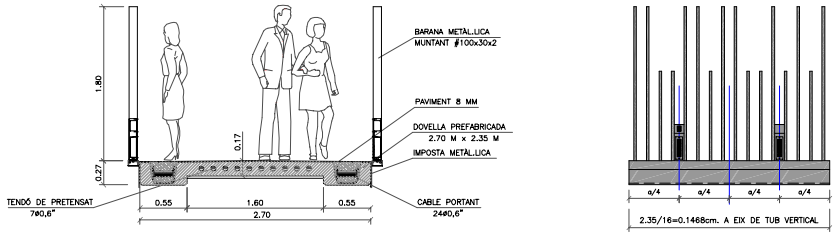
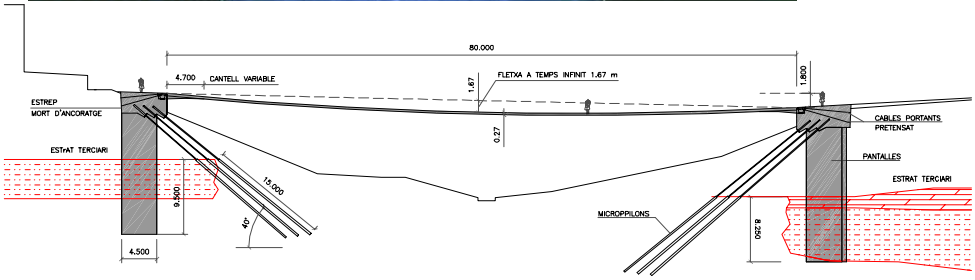


Figure 2. Section and rail module

The passageway was projected roomy (2.70 free metres), enough to make it comfortable but without reaching the Asiatic luxury, and with a bit sophisticated architectonic elements. The rail consists exclusively of vertical uprights of uneven highs to allow the user lines of sight of the Park. At the bottom rail the lighting-beaconing integrates with a set of speakers.



Pictures 4 and 5. Figure 3. Lighting and beaconingt View to the inside of the footbridge Romanesque church. Srtuctural elevation

4. The structure

The footbridge jumps a free span of 80 m, it has a width of 2.70 m and a depth of only 27 cm (nearly L/300). The central sag at infinite time is 1.67 m (L/48) and there is a 1.80 m unevenness between the starting points.