

CNISF
CONSEIL NATIONAL DES INGENIEURS
ET DES SCIENTIFIQUES DE FRANCE



European Council of Civil Engineers Working Group
250 years of Civil Engineering Heritage in Europe

Tunnels

[Return to Table of contents](#)



European Council of Civil Engineers
Working Group: 250 years of Civil Engineering Heritage in Europe

Proposal of Tunnels in France (1/3)

<p>The map shows the Loire River flowing from the north to the south. Key locations marked include Roanne, Clermont-Ferrand, Andrézieux, Saint Etienne, and Lyon. A red box labeled 'Terre-Noire Tunnel' is positioned between Saint Etienne and Lyon, indicating the location of the tunnel.</p>	<p>Tunnel ferroviaire de Terre-Noire. Terre-Noire rail Tunnel. Saint-Etienne (Haute-Loire) -Lyon (Rhône), France (1832).</p> <p>The coal field of Saint-Etienne was the most important in France at the beginning of the 19th Century, then the first rail line was built in 1827 between Saint-Etienne and Andrézieux along the Loire river. The continuation of this line was built in 1832 between Saint-Etienne and Lyon: the main difficulty was the construction of the Terre-Noire tunnel, 1 506 m long, considered as the longest tunnel in the world at this time.</p> <p>The railways line, modernized and equipped as an electric line, is always under traffic.</p> <p><i>Engineer: M. Beaunier Contractor: Marc Seguin</i></p>
---	--

<p>A black and white photograph showing the entrance to the Lioran road tunnel. The entrance is a large, arched stone structure with a smaller archway in front. Several people and horses are visible near the entrance, providing a sense of scale.</p>	<p>Tunnel routier du Lioran. Lioran road Tunnel. (Cantal), France (1848).</p> <p>The Lioran Road tunnel (Massif Central mountains) established a direct link between the cities of Aurillac and Murat. It is 1 404 long and around 7m large. At the time of construction, it was the longest road tunnel in Europe. It is always under road traffic, nevertheless a new road tunnel is under construction, in parallel of the existing one, the previous one being used, in the future, for security and maintenance works.</p> <p><i>Engineer: A. Ruel</i> www.cantal.equipement.gouv.fr °</p>
---	---

Picture : « L'Equipement dans le Cantal » °

<p>A photograph of the Fréjus rail tunnel entrance, showing a large, multi-arched stone structure built into a mountain. The architecture is classical, with multiple levels of arches.</p>	<p>Tunnel ferroviaire du Fréjus. Fréjus rail Tunnel. Modane (Savoie), France-Bardonecchia, Italy (1871).</p> <p>Fréjus Tunnel, under the Alp Mountains, 13.700 m long was, at time of construction, by far, the longest tunnel in the world. Its objective was to link the Piémont region and the Savoie region, at this time under Italian authority. The construction of the tunnel finished as a Franco-Italian work after Savoie region joined France. Considerable difficulties occurred, because of resistance of the rock, but the invention (by G. Sommeiller) of compressed air hammers allowed to solve these problems.</p> <p><i>Designer: Joseph Médail Engineer: Germain Sommeiller</i> www.planete-tp.com °</p>
---	---

Picture : Georges Reverdy °

Web general information : www.planete-tp.com www.stucturae.de



European Council of Civil Engineers
Working Group: 250 years of Civil Engineering Heritage in Europe

Proposal of Tunnels in France (2/3)

	<p>Station Saint-Michel du Métro. Underground Saint-Michel Station. Paris, France (1907).</p> <p>The Line 4 of the Paris Metro crosses the Seine river between Saint-Michel and Châtelet, facing very soft soils conditions. The solution consisted in construction of caissons of exceptional dimensions, at ground level (Cf Picture). Because Paris Metro tubes comprise the 2 lines, the caissons are 12 m high and 16.5 m large. After construction, each element is closed at both ends, transported on the right place by floating on the river, then down lifted on the bottom of the river. Other special techniques were used on this opportunity, for example underground works under pressured air and earthworks in frozen soils.</p>
--	---

Picture : Georges Pilot

	<p>Tunnel de la Croix-Rousse. Croix-Rousse Tunnel. Lyon (Rhône), France (1952).</p> <p>Construction of this urban tunnel began just at the same time as second World War (1940), then he was completed only in 1948 and opened to traffic in 1952. It is 1752 m long and around 12 m large. This tunnel is one of the very first to be equipped with a so huge ventilation system : 5 ventilation plants are constructed for that, associated to 5 vertical shafts.</p> <p>http://nationale7.com °</p>
--	---

Picture : « La route Paris-Côte d'Azur » °

	<p>Tunnel du Mont-Blanc. Mont-Blanc Tunnel. Chamonix (Haute-Savoie), France - Courmayeur, Italie.</p> <p>This Franco-Italian tunnel is one of the longest road tunnels in the world. It links the Chamonix valley in France and the Aoste Valley in Italy. It is one of the key crossings of the Alp Mountains. The tunnel is 11,6 km long, and 8,6 m large, allowing a double direction traffic in the same tube. The thickness of materials over the tunnel is generally more than 1.000 m, more than 2000m on some distances.</p> <p>Contractor: www.atmb.net °</p>
--	---

Document : « Autoroutes et tunnel du Mont-Blanc » °

Web general information : www.planete-tp.com www.stucturae.de



European Council of Civil Engineers
Working Group: 250 years of Civil Engineering Heritage in Europe

Proposal of Tunnels in France (3/3)

	<p>Tunnel sous la Manche. Channel Tunnel. Calais (Pas de Calais). France - Folkestone. UK (1994).</p> <p>This Franco-British undersea tunnel is the longer tunnel in its category in Europe. It is a railways tunnel linking Calais (France) and Folkestone (U.K.), mainly used for the high speed train Paris-London. It comprises 3 tubes, one for each traffic direction and an other one, smaller, for maintenance and security. It is 50,45 km long, and main tubes are around 8 m in diameter. The construction was carried out using a “Tunnel Boring Machine” working 40 m under the sea bottom in the “blue chalk” layer.</p> <p><i>Contractors: Balfour Beatty, Bouygues, Costain Tarmac, Dumez, SAE, SGE, Taylor Woodrow, Wimpey</i> www.groupe-vinci.com °</p>
--	---

Picture : Photothèque VINCI°

	<p>Tunnel Ouest de A 86. Motorway A 86 West Tunnel.(Ile de France). France (2006).</p> <p>This tunnel closes the missing North-South section of the A 86 Motorway, West of Paris. Then, the tunnel is of particular strategic importance for road traffic improvement in the Paris area. This tunnels shows remarkable technical characteristics. First, its length in an urban area, 10km. Second its large diameter, around 12 m outside, 10,40 m inside. Third, its two decks design, one way for each traffic direction.</p> <p><i>Contractors: Cofiroute through, VINCI-Constructono, Eiffage-TP, Cola.s</i> www.groupe.vinci.com °</p>
--	---

Picture : Jean Zindel, Photothèque VINCI °

Cofiroute document