



## Proposal of Railways Infrastructures in France (1/4)

 <p><b>Villars Bridge</b></p> <p>Inventaire supplémentaire des Monuments Historiques</p>	<p><b>The « Saint-Etienne » railways network : the precursor lines. Haute Loire, Rhône, France (1827-1834).</b></p> <p>The first lines were built in the area of Saint-Etienne (Haute-Loire), primarily because the main coal basin at this time in France was located in this area. At the light of English experience it appeared that rail transport should be more effective than road transport and waterways transport. Then first lines built are as follows:</p> <ol style="list-style-type: none"> <li>1. Saint-Etienne/Andrézieux line, on the Loire River (1827). 21,3 km long, initially for coal transport.</li> <li>2. Saint-Etienne/Lyon line (1831). 58 km long, for coal transport, also first line for passengers transport.</li> <li>3. Andrézieux/Roanne (1832). 57 km long, line opened to both goods transport and passengers transport.</li> </ol> <p><i>Designer: M. de Gallois Engineers: 1, Louis-Antoine Beaunier 2, Marc Seguin 3, F.-N. Mellet and C.-J. Henry <a href="http://www.vieux-saint-etienne.com">www.vieux-saint-etienne.com</a></i></p>
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Picture : Hamkova Selvina, AVSE, Collection Musée du vieux Saint-Etienne °

 <p><b>Batignolles cut (Ex tunnel)</b></p>	<p><b>Paris/Saint Germain line. France (1837/1847).</b></p> <p>The first section of this line, 19 km long, joined Le Pecq, 51 m down to the Saint-Germain terrace, west of Paris. It was opened in 1837. This line comprised a tunnel 270 m long (The Batignolles tunnel) and 3 bridges built on the Seine River. It was the first line completely designed for passenger transport, so it met a considerable success.</p> <p>The second section, to Saint-Germain, was opened in 1847, as a ramp, using a specific “atmospheric” system, used only in Ireland (1841) and in Le Pecq. Later on a normal railway was built, replacing this non-conventional system.</p> <p>A part of this line is now integrated in the A line of the “Réseau Express Régional”.</p> <p><i>Engineers: S. Flachet, E. Flachet, M. Lamé, M. Clapeyron.</i></p>
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Picture : Georges Pilot

 <p><b>Chaumont Viaduct</b></p>	<p><b>Paris-Bâle line. France. (1858)</b></p> <p>This line was built in connexion with the « Réseau en étoile Legrand », officially launched in 1842 in order, mainly, to connect Paris to the borders, then to foreign countries. So, this line, 490 km long, is going first to Mulhouse, through Troyes and Chaumont, finally to Bâle (Switzerland).</p> <p>The line comprises 2 remarkable bridges : the “Nogent sur Marne” stone bridge (1856), near Paris, 830 m long and 26 m high (partly reconstructed in 1945, with 3 reinforced concrete arches, 80m, 70m, 68m long spans) and the Chaumont stone bridge (Haute-Marne), 600 m long (50 spans) and 22m high, on 3 levels (Pedestrians, technical services, the rail line).</p> <p><i>Nogent. Engineers: L.Collet-Meygret, Pluyette, M.E. Vuigner. Contractors : Parent, Schaken, Caillet. Chaumont Engineers :E. Decomble, M. Zeiller</i></p>
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Picture : Guy Sauvage (SNCF French Railways)



## Proposal of Railways Infrastructures in France (2/4)

 <p><b>Chamborigaud Viaduct</b></p>	<p><b>Cévennes line. Clermont-Ferrand/Domeyrat-Nîmes. France (1840-1870)</b></p> <p>This line, 260 km long serves Departments of Haute-Loire, Puy-de-Dôme, Lozère, and Gard. It was opened step by step, from 1840 to 1870. It crosses the mountainous areas of “Massif Central” and “Cevennes” mountains, so it is a very technical line, comprising around 50 bridges and viaducts, and more than 100 tunnels. The most famous work is the stone Chamborigaud bridge (1867), built on the Luech River (Gard). It 198 m long and 43 m high, comprising 2 curved parts, with respectively, 12 arches (14 m span) and 17 arches (8 m span). It is an historical monument</p> <p><i>Engineers: M. Ruelle, Dombre, Joubert Contractors: Marrigues and Ramoal <a href="http://www.structurae.de">www.structurae.de</a></i></p>
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Picture : Philippe Bourret °

 <p><b>La Bouble Viaduct</b></p>	<p><b>Montluçon-Gannat line. France (1871)</b></p> <p>This line, 52 km long, serves cities in the Department of Allier. It is located in the Massif Central Mountains, so it comprises 6 tunnels, 7 bridges and 6 viaducts.</p> <p>The most famous viaducts consists in a series of 4 similar works with truss in wrought iron: La Bouble (1868), Neuval (1868), Le Belon (1869), Rouzat (1869). (Rouzat and Neuval bridges are historical monuments). La Bouble Viaduct was the prototype. It is 300m long, (comprising 6 spans, 50m long each), and 62 m high, with wrought iron columns. Accesses to iron bridges comprise stone viaducts.</p> <p><i>Engineers :Romain Morandière and Wilhelm Nördling for the line, Félix Moreaux, Wilhelm Nördlin, Gustave Eiffel.</i></p>
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Picture : Guy Sauvage (SNCF French Railways)

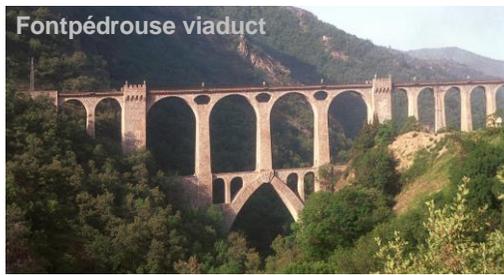
 <p><b>La Cabre tunnel</b></p>	<p><b>Valence-Briançon line. France. (1871-1909)</b></p> <p>This line, 242 km long, serves Drôme Department (Valence) and Hautes-Alpes Department (Die, Veynes, Gap, Briançon). It is of importance for local, regional and national traffic because linking the Rhône River valley, with a TGV station in Valence, and Briançon, head of the important “Serre Chevallier” winter ski and summer resort.</p> <p>It is constructed in the Pré-Alps mountains and in the Alpes du Sud mountains, then it comprises many civil engineering works, tunnels, bridges and viaducts. Amongst these works are to be noted the “Col de la Cabre” tunnel (1891), 3764 m long, and Le Claps viaduct 220 m long (1977).</p> <p><a href="http://www.structurae.de">www.structurae.de</a></p>
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Picture : Jacques Mossot °

Web general references : [www.trains-fr.org/ahicf](http://www.trains-fr.org/ahicf) [www.planete-tp.com](http://www.planete-tp.com) [www.stucturae.de](http://www.stucturae.de)



**Proposal of Railways Infrastructures in France (3/4)**

 <p>Fontpédrouse viaduct</p>	<p><b>The “Train jaune”. Villefranche-de-Conflent/La-Tour-de-Carol (Pyrénées Orientales). France (1910)</b></p> <p>This local train, located in the Pyrénées mountains, improved the links inside the “Pyrénées-Orientales” Department. It is a narrow gauge (1m between rails) single-track railway, 62 km long, the highest one in France (Bolquère train station is at 1592 m in altitude). It is remarkable with a rare electric traction at this time (Hydraulic dams were constructed for this purpose). It was constructed for passengers transport, as well as goods transport (Agriculture products, iron, manganese and spath ores, etc.).</p> <p>The line comprises 19 tunnels and 5 bridges, with the 2 remarkable Gisclard bridge and Fontpédrouse viaduct.</p> <p><i>Engineers : Jules Lax, Albert Gisclard, Paul Séjourné</i> <a href="http://www.tramwaytetg.free.fr/page16.htm">www.tramwaytetg.free.fr/page16.htm</a> °</p>
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Picture : Guy Sauvage SNCF (French railways)

 <p>«Calanque des eaux salées» bridge</p>	<p><b>Miramas-L’Estaque line. France. (1915)</b></p> <p>This line, 61 km long, was constructed in the Bouches-du Rhône Department, linking along the sea coast the cities of Miramas and Marseille. Largely used for the economical development of the region at the time of construction, it is now mainly devoted to tourism.</p> <p>The line comprises many civil engineering works: 22 viaducts and bridges, 23 tunnels and 3 underground galleries. Main viaducts are : the stone “Pont de la calanque des eaux salées” (1914) 115m long with an arch 50m span, the steel “Pont de Caronte” (1915), 843m long with 2 rotating spans 57 m long each, and the stone “Pont de Corbières”, 179 m long.</p> <p><i>Engineers : Paul Séjourné for the stone bridges.</i> <a href="http://bernard.chappe.free.fr/train2.htm">http://bernard.chappe.free.fr/train2.htm</a></p>
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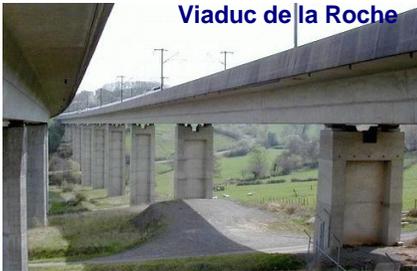
Picture : Guy Sauvage SNCF (French railways)

 <p>Col de Tende tunnel</p>	<p><b>Nice-Coni (Cuneo) line. France. (1928, 1979)</b></p> <p>This line is constructed in the Alpes-Maritimes Department from Nice to the franco-italian boundary, then in Piemont province until Cuneo (Italy). In France, it serves cities of Nice, Sospel, Breil-sur-Roya, Tende. Partly built in the south of the Alp mountains, it comprises a big number of civil engineering works. Main tunnels are Col-de-Braus tunnel, 5939 m long, Col de Tende tunnel (1898), 8099 m long, and Berghe helicoïdal tunnel. Remarkable viaducts are Erbossiéra viaduct, Bévéra viaduct, Escarène viaduct and Saorge viaduct.</p> <p><i>Engineers : Paul Séjourné, André Martinet.</i> <a href="http://home.scarlet.be/roya/train">http://home.scarlet.be/roya/train</a> ° <a href="http://www.structurae.de">www.structurae.de</a></p>
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Picture : Olivier Koot °



## Proposal of Railways Infrastructures in France (4/4)

 <p>Viaduc de la Roche</p>	<p><b>LGV (Ligne à Grande Vitesse) Paris “Sud-Est”. Paris-Lyon, France. (1983)</b></p> <p>This High Speed Line, linking cities of Paris and Lyon, is 538 km long. Designed for a 270 km/h basic speed, it is the first High Speed Line constructed in Europe.</p> <p>It comprises 7 major bridges and sophisticated embankments. The rail platform is designed as an highways pavement supporting the appropriate rail equipments.</p> <p>This new line needed the construction of 2 major train terminals in Paris (Gare de Lyon) and in Lyon (Gare de la Part-Dieu).</p> <p><i>Engineers: Guy Verrier, M. Gandil, M. Ramondenc</i></p> <p style="text-align: right;"><a href="http://www.stucturae.de">www.stucturae.de</a> °</p>
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Photographie : Jacques Mossot °

 <p>Garde-Adhémar bridge</p>	<p><b>LGV (Ligne à Grande Vitesse) “Méditerranée”. Valence-Marseille. France. (2001)</b></p> <p>This new High Speed Line, 250 km long, designed for a 300 km/h basic speed, is the south extension of the existing TGV Paris-Lyon-Valence line.</p> <p>The design responds to huge challenges of extremely limited space in the Rhône river valley, of severe environmental conditions and of exceptional civil engineering works. It comprises 22 major bridges and 13 km of tunnels.</p> <p>It needed the construction of 3 new train stations in Valence, Avignon and Aix-en-Provence.</p> <p><i>Engineers: Pierre Izard, Gilles Cartier, M. Ramondenc</i></p>
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Picture : Guy Sauvage SNCF (French railways)