Dominique Perrault Architect

VILLEJUIF - GUSTAVE ROUSSY STATION

VILLEJUIF, FRANCE





The Villejuif-Gustave Roussy Station aims to erase the threshold between the open public space and the closed space of the station by blurring the limits of the city. Its helicoidal architecture on the surface exerts a centripetal force on the urban fabric which draws it towards the space that has been competed underground. The large concrete cylinder with its moulded wall, flooded with light, is traversed, and enlivened by footbridges and escalators. Here, the sky of this inverted skyscraper is simply the ground level of the city. Natural light pours all the way down to the platforms located some fifty meters below. The sky is above the railways.

This exposed infrastructure is given maximum visibility and incorporates the logic of construction. The architectural layout is part of the urban cityscape. By erasing in the ground and prolonging uses and views between the surface and the subterranean domain, it unifies the vertical dynamics of access to the transport network. The architectural treatment transfigures this infrastructure now become architecture.

Without walls of façade, the architecture of this station sunken into the ground is not in opposition to the city or anything else. It frees the horizon and disappears from the urban silhouette, swallowing up with it then bit of sky.

Dominique Perrault, 2024



Grand Paris express map © Société des grands projets

The Société des grands projets is one of France's leading project developers. It was created in June 2010, initially under the name Société du Grand Paris, to manage the construction of the Grand Paris Express and support the transformation of the metropolis through urban development and real estate projects around the stations.

200 km of automated metro and 68 stations by 2030

The Grand Paris Express is the most important urban development project in Europe, in terms of the breadth of its future network of 200 km of metro, the innovation of its 68 stations, the urban impact of its 140 km2 across the territories of Grand Paris, and the ambition f its artistic and cultural approach along its entire length.

Like all 68 new stations on the Grand Paris Express, the Villejuif - Gustave Roussy station has its own unique architecture. From the outset, the Société des grands projets wanted **each of the new stations to go beyond its functional framework, leaving an urban and architectural legacy** for the area it serves. All the stations have been designed in collaboration with renowned architects, making some of them among the most aesthetically pleasing in the world.

The aim of Société des grands projets is to make travel as pleasant as possible, with **aesthetic, practical and comfortable** passenger buildings **that contribute to the urban and social transformation of the territory.**

A project for transforming the city

Line 14 is extended to the north and south of Paris **4 new automated metro lines** serving the inner and outer rings of suburbs **68 stations** all accessible, designed for the comfort of passengers and open to the city **80% of the stations** connected to the existing network: Metro, RER, Transilien, and Tramway **2 to 3 mn** between each train, with an average speed of between 55 and 65 km/h **3 million voyagers** transported each day. The Grand Paris Express will relieve the pressure on the existing network.

The Groundscape and the territory by Dominique Perrault

Today, the Grand Paris Express is the largest project of civil engineering in Europe including over 200 km of automated lines and 68 new stations. It involves first and foremost a territorial project and the making of a new city in sync with the collective aspirations for a new urban experience. The Grand Paris Express is a major piece of this major bet of the metropolis.

A new territory is taking shape before our eyes, made available to the greatest number. The objective is not merely to ensure access to the capital to all inhabitants of the region but also to develop new zones of live and activity across the entire metropolitan region. The development of the districts surrounding the new stations of the Grand Paris Express is, in that sense, a challenge of urbanity inherent to the territory's programme of metropolization. Their perimeters, defined as a circle of 800m of circumference, will represent nothing less than one and a half times the size of Paris proper and more than twenty percent of the population of the new metropolis.

What are the challenges facing Grand Paris? Increasing the hospitality of cities, exurban and rural zones, rectifying spatial segregation and relegation of every type, encouraging social diversity without further weakening the most disadvantaged citizens, promote housing and new modes of habitat, optimise mobility, intensify the connexions between urban centres, contribute to the boosting labour markets, and, finally, to the emergence of the sustainable metropolis facing the challenge of climate change.

Excerpt from the catalogue of the exhibition "Métro! Le Grand Paris en movement", Cité de l'architecture et du patrimoine, Novembre 2023-June 2024.

This book, first multidisciplinary panorama of the metro and its future, places in dialogue a range of viewpoints, challenges, and perspectives, outlining one by one a new mental map of the metropolis.

Section of the Villejuif-Gustave Roussy Station, 2017 © Dominique Perrault Architecte, ADAGP

Studies begin 2013 Works begin April 2017 **Completion** December 2024

Client Société des grands projets (SGP) Engineering project management SETEC AMO Artemis (groupement Artelia + Arcadis + BG) Project Management Dominique Perrault Architect **Engineering** SETEC TPI (civil engineering), SETEC bâtiment (construction engineering), Ingérop (coordination, interfaces), TESS (special structure, façades, roofing ETFE), AXIO (economist), Jean-Paul Lamoureux (acoustics and photometrics), Denis Thélot (fire safety and accessibility)

Entreprises Groupement CAP (Vinci construction, Spie Batignolles), Systra, Artelia, Bouygues bâtiment IDF, AXIMA, INEO

Site surface area 7,500 m² Project surface area 15,364 m² Built volume 203,771 m³

Well diameter 70 m Depth of moulded walls 42 m Depth of line 15 South platforms 49 m Depth of line 14 South platforms 37 m Number of escalators 32

Section model of the Villejuif-Gustave Roussy Station, 2015 © Dominique Perrault Architecte, ADAGP

View of the construction site after the passage of the Allison TBM for the extension of line 14 and before the passage of the Amandine TBM for the creation of line 15

Perspective of the monumental escalators providing access to the platforms of lines 14 and 15

View of the two intersecting tunnels at the heart of the station, one above the other, at a depth of over 50 metres.

View of the reinforced concrete station structure opening onto the sky

Arial view of the Villejuif-Gustave Roussy Station and the district under construction, 2023 © Anne-Claude Barbier / Dominique Perrault Architecte, ADAGP

View of the great cylinder open to the sky © Michel Denancé / Dominique Perrault Architecte, ADAGP

A metropolitan station

Located on the highest point of the Longboyau Plateau, in the departmental park of the Hautes Bruyères, the Villejuif-Gustave Roussy Station, with a depth of some 50 metres separating the street level from the one of the platforms, will be one of the deepest transport infrastructures in France.

Located on the line 15 South, which links Pont de Sèvres with Noisy-Champs, the future Villejuif Institut Gustave-Roussy will create the interconnexion with the extended line 14 and will welcome some 100,000 passengers every day from January 2025. It will serve the ZAC Campus Grand Parc and the Institut Gustave-Roussy, the leading cancer treatment centre in Europe.

An emblematic station of the Réseau du Grand Paris Express, owing as much to the role of infrastructure in developing the territory, as to the interconnexion it will ensure between two metro lines, the architecture for the future station expresses the determination of the project to place in dialogue, unite, and federate these spaces.

"A station as connector if he world above and below."

Dominique Perrault

There is no formal demonstrativeness or eccentricity from the design point of view. Essentially developed below ground, on the surface takes the appearance of a pavilion, and blends the outside with the inside, the infrastructural and the urban. It structures the emergence of new territory of the Grand Paris, and contributes to the transformation of the city into a metropolis, and the suburbs into a city. It involves placing the hospital centre in a network and transforming its surrounding district onto a campus. The station as an element of this system, is a "place of exchange", a central element of the interconnexions between the major hospital, future office and housing buildings and the large park. It will also create a link between the urban and landscape places, by extending the uses and the views between above and below. A generous space, the station stretches, loosens, and infiltrates the underground, like an extension of the city below ground. Its architecture is designed in the continuity of the surrounding public space. It does not oppose the city, stand against it, raise up anu sort of façade, no wall. This station must be grasped as a connector of the world below with the world above, and vice versa. It is a great cylinder, open, empty, with a diameter of 70 metres. An emptied 30 metres inside the cylinder, surrounded by galleries and balconies, welcomes the great escalators. The engineering studies were developed in a way that design of the infrastructure corresponds to the design of the station: light and readable architecture that accompanies flows as naturally as possible.

Extending the city underground

Section of the station's different levels © Dominique Perrault Architecte, ADAGP

Connecting the Gustave Roussy Hospital with the larger network

On the level of the square, the forecourt leads naturally towards the first balcony overlooking the central void. Little kiosks house a range of services and punctuate the periphery of the station. Walls draped with metal mesh enable the closure of the station. These elements are a light form of limit offing view onto the city and the park.

Open access (i.e., without a ticket) is possible down to level -2. The first two levels of balcony galleries house shops and services, accentuating the continuity of the station with the public space above.

The project facilitates easy comprehension of the space and the circulations. When leaving the platforms, directly linked to the vast central void, users easily find their bearings and directions. From the two levels of platforms – the two metro lines being located in two perpendicularly superimposed tunnels monumental escalators lead to the surface, guided by natural light.

The transparent central circular roof protects the interior of the station © Michel Denancé / Dominique Perrault Architecte, ADAGP

heating. rafters.

An open-air station

The station benefits from natural light and ventilation. In direct contact with the platforms, the vast central void and the various balcony circulations are bathed in natural light and open air. This principle is what makes one of the forms of prowess of this infrastructure possible, i.e., the one of eliminating the need for smoke extractors in its central part (the well). Travellers will also be in contact with the ambient temperature, which is more temperate at this depth than on the surface, without reliance on additional

The roof over the station is composed of three layers. A centrale transparent circular one protects from rain while allowing outside air to circulate laterally. This roof consists of a one peripheral beam on which all the tie rods and cables are linked with the central hub, the "eye" of the station. Stretched over the cables are elements made of ETFE (ethylene tetrafluoroethylene), the material chosen for its high quality of transparency, lightness, resistance, and its great fineness. Two other roofs, non -concentric disks placed at two different heights, cover the station. Like two great marquees, they radiate over the forecourt and signal the presence of the station whilst also ensuring user protection from the sun, like sunshades over the public space. They are composed of strips of stainless-steel spiralled metal mesh, stretched between the radial

Naked cavalier perspective of the République metro station in Paris © Encyclopédie pittoresque de la France

Resilience

Resilience is a word of our times. A programming word, capable of creating a system given that it predicts the future of human societies facing planet-wide climatic shock, along with these watch words: assimilate, endure, react, subsist.

By resilience, one designates the ability of materials to resist forces of rupture and weather. By choosing concrete for the structure and glass and stainless steel for cladding, the station is anchored in the determination of solidity and durability. The overall composition is minimal and all the elements have a function, whether structural or technical. By employing natural resources available underground, the station is as delicately integrated as possible in its environment, which enables, among other advantages, to insulate the interior from the exterior earth and to maintain a constant temperature by using the surrounding earth, thereby eliminating the need for additional heating, airconditioning, or smoke extraction. This ensures important cost savings, sustainability, and comfort of users.

"In the metropolis crossed by the Grand Paris Express, is reflected in a new light, the ancient image of the great city-world, resilient and sustainable."

Dominique Perrault

View of the large escalators of the entrance © Michel Denancé / Dominique Perrault Architecte, ADAGP

The world underground is often synonymous with discomfort, cold, mystery, and obscurity. The station being anchored in the deep whilst allowing light and air to pour in, it offers users the opposite experience. As users penetrate this space, they understand that the ground is no longer anxiety-provoking, closed, and damp, but rather that it offers comfort and an experience engaging all the senses. The central well makes it possible to gather in the heart of this innovative facility all travellers who, though in transit, are in contact with what is happening inside. By confusing the public space and the station, the project transgresses the traditional terminology of buried works to become a fully public facility. It is in this sense that the station is the extension of the city in that we encounter the same ambiance whether we are above or below. The station is no longer merely a work of transport infrastructure, and a place of circulation, but now it has become a lively place of exchange offering users, beyond simply a concentration of services, new forms of urban living, between individual pathways and the public space. Places in the fullest sense of the term, endowed with qualities, able to host uses that exceed transport.

The "sous-terrestre"

Metal mesh ornamentation of the central barrel of the station © Arthur Jan / Dominique Perrault Architecte, ADAGP

Materiality, light, acoustics

Gaëlle Lauriot-Prévost, an associate of the Dominique Perrault Architecture firm, designed the interior layouts, lighting and acoustics. The materiality of the project makes use of stainless steel in a range of textures: smooth, mesh, perforated, mirror polish, and satiny. These finishings create different ambiances, whilst also favouring the propagation of light, through the play of reflections, brilliances, and filters.

Des disks with a surface area of 3,273 m², composed of swaths of spiralled stainless-steel mesh, stretched between radial beams, structure the exterior roof. Inside, 1,808 m² of silvery aluminium wire clad the great well, thus electrifying the heart of the station. Originally an industrial product, previously considered as cold and rigid, metal mesh is assigned a new function: neither wall nor structure, it is used to rethink the notion of protection, and acoustics, dematerialize volumes, introduce the play with lighting and reflection, and to clad here and there the station and its facilities.

On the ceiling, light fixtures and acoustic baffles alternate, giving the station a regular rhythm. Light from the industrial light fixtures blends with daylight and is reflected by the meatal surfaces, immersing travellers in a genuine light show. "In Villejuif, the lines are blurred by the superposition of woven elements: the strips of fabric woven together are themselves woven material. The effect of undulation functions as it does because there is always a strip to shine. At night, the lighting effects enhance safety and the aesthetic value of the space. In the barrel, woven sheets reaching a height of fourteen metres ensure calmer acoustics. Light slips through them down to the deepest areas of the station."

Gaëlle Lauriot-Prévost, on metal mesh, 2024

Play of regularity between the lighting system and acoustic baffles on the ceiling of the station © Michel Denancé / Dominique Perrault Architecte, ADAGP

Closeup of the interior of neon tubes in the Cadran solaire by Ivan Navarro © Arthur Jan / Dominique Perrault Architecte, ADAGP

Perspective of the Cadran Solaire (Sundial) art piece by Ivan Navarro on the circular ceiling of level -9 © Société des grands projets

A subterranean Vault of Heaven

Cadran solaire by Ivan Navarro

height.

Artistic commission

The Société des Grands Projets early on decided to dedicate one per one thousand of its budgetary resources, some thirty-five million euros, for the inclusion of contemporary art in the spaces and the architecture of the 68 new stations, designed as full-fledged living areas and places of discovery. A vast museum visited by everyone visits with a transport ticket.

"Evolve the frontiers that separate interior spaces of the station towards infinite architectural orientations." Such was the ambition of the Chilean artist Ivan Navarro for his project in the heart of the Villejuif station. The artist became an astronomer - and a bit of magician - to cause to appear, in the location of the circular ceiling of level -9 a sky studded with neon tubes and mirrors, creating the sensation of infinite depth. The names of stars have been engraved on the 58 light boxes of which it is composed. This work offers a cosmic visual experience to all passengers.

Ceiling Level -9, LED tubes, mirrors made of Dibond without silvering, aluminium, sand-covered lettering, 58 trapezoidal boxes 1.9 m long, 39 cm and 43 cm wide and 30 cm in

Villejuif station will soon be welcoming passengers: early 2025 for line 14 and summer 2026 for line 15 © Dominique Perrault Architecte, ADAGP

KEY FACTS AND FIGURES

An emblematic project of the Grand Paris Express

- One of the 68 new stations of the Grand Paris Express, one of Europe's largest urban projects, 200km of automatic lines. - Goal: to give reality to the Greater Paris metropolis through mobility and the blurring of boundaries between the city-center and its suburbs.

Innovative architecture

- Designed by Dominique Perrault, the station, located 50m underground, links the city to its subsoil, creating functional and visual continuity. Architecture merges city and infrastructure. - Sleek design: no walls or facades, a vast cylindrical central shaft bathed in natural light thanks to a transparent double roof and reflective materials.

Territory impact

- A place to live: integration of public spaces, shops and services on the first two levels.

- Located in the ZAC Campus Grand Parc, it will link the Institut Gustave Roussy hospital network, the park and the new district. - A vector of development for the surrounding neighborhoods, integrating social diversity and new employment pools.

Sustainability

- Resilience and energy efficiency: natural smoke extraction (excluding technical areas), reduced heating and coolir requirements thanks to natural underground resources. - Resistant materials: concrete, stainless steel, glass and wi mesh.

Contemporary art

- In "Tandem", Chilean artist Ivan Navarro has designed Cadran solaire, a starry sky of neon lights and mirrors. - Goal: to make the Grand Paris Express network a museu accessible to all.

Important dates

	Studies begin 2013
on	Works begin April 2017
ng	Completion December 2024
•	Commissioning of line 14 2025
ire	Commissioning of line 15 2026
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Key figures

	Project surface area 15,364 m ²
ed	Built volume 203,771 m³
	Depth of line 15 South platforms 49 m
Jm	Depth of line 14 South platforms 37 m
	Expected capacity 100,000 daily voyagers

METROPOLITANS INFRASTRUCTURES/ARCHITECTURES

Gangnam International Transit Center - Lightwalk Seoul, South Korea 2017-2028

The Gangnam International Transit Centre (GITC) in Seoul is an immense subterranean transport platform located to the south of the Han River, in the middle of the Gangnam business district. The objective was to create a novel public space, designed to shine, inspire, and influence well beyond its location and to share a common spirit with the Villejuif station, i.e. the idea that the future of our cities will require the reinvention of territories starting with their underground zones and the creation of architecture anchored in their geography. The urbanism advocated in Groundscape promotes "rooted" architecture, viewing the ground as a resource that extends and broadens our world.

Exhibition "Métro! Le Grand Paris en movement" Cité de l'architecture et du patrimoine, Paris, France 2023-2024

Dominique Perrault was, along with Francis Rambert, co-curator of the exhibition "Métro! Le Grand Paris en movement", presented from 8 November 2023 to 2 June 2024, at the Cité de l'architecture et du Patrimoine. Dedicated to the Grand Paris Express, this exhibition plunged visitors into the heart of one of the world's most important infrastructure and architecture projects. All the arts, from illustration to cinema, were brought together to tell the story, through the prism of the metropolis, of the construction of the Grand Paris as well as the transformation of this territory in this period of ecological transition.

Île de la Cité Mission

Paris, France 2015–2017

The aim of this project is to restore life to the entire "monument island" of Paris. Over the course of the 19th century, as the buildings for housing and commerce were replaced by major public institutions, the whole island was transformed into an administrative centre. Today, the Paris Court of Justice, the prefecture of police and the Hôtel-Dieu hospital, must consider their repurposing. 35 proposals were imagined in order to reveal the immense heritage of the island, optimise its available surfaces, diversify its uses, render its pathways more fluid and to take back its public spaces. The project recommends taking advantage of the islands antractuosities, its hidden spaces, interior courtyards, passages, and subterranean zones. The interest of this approach is to foster an architectural, political, and economic reflexion.

Garibaldi Square and Station Naples, Italy 2004-2019

In 2004, studies were undertaken for the redevelopment of the Piazza Garibaldi and the creation of the eponymous metro station. Opened in Decembre 2013, the station provides access from the Piazza to the new metropolitan transport network. To reawaken a territory of such a dimension, the architect worked through division and installed several places on the quare, at the scale of the pedestrian, in order to increase uses and enable quality urban life day and night. Just as with the Villejuif station, natural light descends all the way down to the platforms of the Garibaldi station, at some forty metres below the square. In the central barrel, escalators fold and unfold, regularly inverting under the variations of the Neapolitan sky.

© The Sankei Shimbun / Dominique Perrault Architecte, ADAGP

Lightwalk. Honorary Professor at the Ecole Polytechnique In 1989, the architect and urbanist Dominique Perrault Fédérale de Lausanne (EPFL), he is also winner of was awarded the project to build the Bibliothèque the Praemium Imperiale and a member of the Institut nationale de France, a building now fully part of the history of 20th-century architecture. Recognised de France. In November 2019, he was nominated internationally, he has completed many innovative, the General Director of the 2021 Seoul Biennale of large-scale projects such as the Velodrome and Olympic Architecture and Urbanism. swimming pool in Berlin (1999), the Campus Complex Centre of the Ewha Womans University in Seoul Dominique Perrault and the architect, designer, and scenographer Gaëlle Lauriot-Prévost have been associates since 1989. The complementarity of these (2008), the two most recent extensions of the Court of Justice of the European Union in Luxembourg (2019), the covering of the Suzanne Lenglen Tennis Court in two creators has resulted in their perfect mastery of Paris (2024), and is currently transforming the former air architectural quality, the urban scale, and detail. terminal at Invalides into the future museum-school of the Giacometti Foundation. Between 2024 and 2028, in addition to the Villejuif

Envisaging architecture as a discipline intrinsically linked with urban planning, Dominique Perrault has worked namely on the urban future of the Île de la Cité in Paris, developed the Atheletes Village for the Paris 2024 Olympic Games and is currently designing a vast intermodal transit centre for the city of Seoul named the Between 2024 and 2028, in addition to the Villejuif Gustave Roussy Station, many projects designed by Dominique Perrault will be completed in France and abroad, such as the To Tower in Lyon, the extension of the Esplanade-Cupola of the EPFL Campus in Lausanne, the extension of the Caja Magica in Madrid and the many towers of flats and offices in Seoul, South Korea.

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