EUROSTAR, YOU'RE A STAR

Working at full throttle to build the railway station of the 21st Century, the Eurostar Terminal of the Gare du Midi Station in Brussels

by Francesco Stronati and Aristide Mariotti

PHOTO 1

PHOTO 2

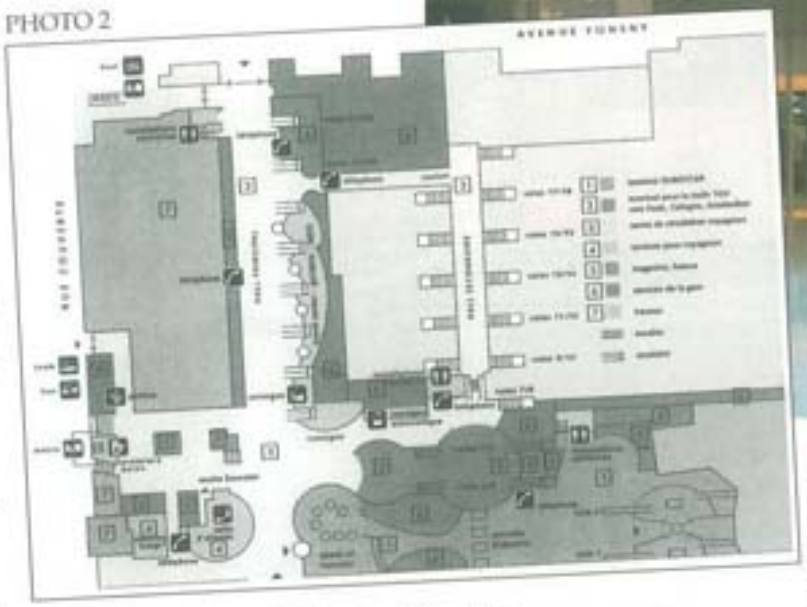

Photo 1
The Eurostar Terminal

Photo 2
Plan of the new terminal

The new Eurostar train which links London and Brussels, hurtling through the Channel Tunnel, sparked the impetus to begin work on the renovation of the Gare du Midi railway station in Brussels.The Eurostar project became a reality in 1990 when the Belgian government gave the go-ahead to build a high-speed rail line, the TGV (Train à Grande Vitesse). That same year the Belgian State Railways and a group of private investors founded Eurostation S.A. to plan the rebuilding of the Brussels Midi station, which is used by 400 million passengers a year. Work began in 1992 and is scheduled for completion in the year 2000, by which time the entire station will have been renovated and ready to receive 270,000 passengers a day. In charge of construction are Ing. Persoons and the architectural firm of De Vreese and Parijs.

Maximum security for Eurostar

Situated at a right angle to the Main Concourse of the old station, the new TGV Terminal is completely self-contained. It houses Tracks 1 and 2 which are reserved exclusively for Eurostar trains. The Eurostar must follow very strict security procedures and therefore this part of the station must be completely closed off.

STAGES OF CONSTRUCTION

1992	Start of demolition work on the Tower of the old station. Tracks 1 and 2 are readied for Eurostar London -Brussels trains; new floors, ceilings and lighting are installed in the main connecting corridor; new escalators leading to the train platforms are designed; the Travel Center is completed; the catering operation is installed in the Salik Building and a tunnel with escalators is built from the catering company to the TGV platforms.
1994	The TGV Eurostar Terminal is officially opened to receive passengers in November.
1995	The last section of the TGV Terminal (tracks 3 to 6) is completed and temporarily used for international trains, to be gradually replaced by TGV trains; waiting rooms are completed.
1996	The Thalys train is inaugurated (the PBKA line: Paris, Brussels, Cologne, Amsterdam).
1997	The retail space area is opened.
2000	Planned completion date for the renovation of the entire station.

Photo 3
Preparing the mix for the MAPECEM screed

Photo 4
Leveling the MAPECEM screed

Photo 5
Using a finishing machine for a perfect finish on the surface of the substrate

Photo 6
Installing the marble agglomerate tiles with GRANIRAPID

Photo 7
Detail of the floor tiles, set and ready to be grouted with KERACOLOR

Some sections are reserved for passport control and baggage check, while others are designed for passing time agreeably between connections in bars, boutiques and waiting-rooms. Another TGV Terminal, also known as the PBKA (Paris-Brussels-Cologne-Amsterdam) is located on Tracks 3 to 6. This area has been left open, since it does not require security checks at the entrance. The station is on two floors. Ticket counters and waiting rooms are located on the ground floor and train platforms on the floor above. The project also calls for the eventual construction of retail space for forty shops, hotels and snack bars located on one side of the Main Concourse. On the other side of the Concourse the Travel Center is in its final phase of construction. Here 34 automated ticketing machines will replace the old ticket windows. The entire area surrounding the Brussels Midi Station is slated for change. The renovation of the station is linked to a wider urban renewal project which covers an area of 120,000 sq. m., of which 20,000 are planned for hotels, 10,000 for residences and 2,500 for parking garages.

PHOTO 3

PHOTO 4

PHOTO 5

PHOTO 6

PHOTO 7

PHOTO 8

Photos 8 and 9
Channeling the flow of passengers toward the Eurostar check-in counters and platforms

The main challenges: Time and Logistics

The construction firms working on the Eurostar Terminal had to meet many challenges. One of the most pressing problems was installing the floor quickly. "The time factor has always been our biggest challenge," observed Frans Vandermeersch, Project Manager for CFE Construction. "The station remained open, with over 100,000 passengers transiting each day, so it was impossible to work on more than two platforms at a time. The logistics of the job site presented another major problem: before we could install the new one, we had to demolish the old floor of the main connecting corridor completely, but without entirely blocking off passenger access. The old one had buckled in several places and only risked getting worse over time, so we had to remove it, along with the old substrate."

Fast products for short deadlines

To address timing and logistics problems most effectively, the Project Managers required the use of fast-setting products. The ground floor corridor was divided into sections which were closed to traffic only a few days at a time.

Substrates first

The first job to be tackled was the removal of the old flooring and substrate right down to the reinforced concrete slab underneath. Then a new substrate was made with MAPECEM, the special hydraulic binder for fast-drying shrinkage compensated screeds. MAPECEM mixed with water and aggregates produces a mix that hardens and cures in an extremely short time, so the MAPECEM screed was ready to be tiled over in only 24 hours.
This way an enormous amount of time was saved on the job-site, avoiding the long cure times required by conventional substrates (at least 28 days) before being able to install ceramic tile or natural stone flooring.
Thanks to the high mechanical strength of the MAPECEM screed it was possible to open the floor to heavy traffic only 24 hours after installation. To anchor the new substrate to the concrete slab, a bonding slurry was applied consisting of one part by water PLANICRETE (synthetic rubber latex for cementitious mortars) and two parts MAPECEM. The mortar for the substrate was poured before the bonding slurry had completely hardened.

An agglomerated marble floor

Planning the installation of the flooring required extreme precision since it was a mosaic of marble tiles with colored motifs and many curving designs. The surface of the screed was finished with a finishing machine while the MAPECEM was still fresh. The flooring of agglomerated marble tiles with polyester resins was custom made for this project by Marbra Lys and required the use of a fast-setting and drying adhesive with high adhesion. GRANIRAPID was selected because it meets all these requirements. Only 3 to 4 hours after installing the floor covering with GRANIRAPID it was possible to grout the joints with KERACOLOR FINE GRAIN, a ready-mixed cement mortar for filling joints from 0 to 4 mm. All of these products were used not only for the flooring of the entire first floor of the new terminal, but also on the platforms of

PHOTO 9

ceramic tiles over cement rendering on the walls of the bathrooms in the terminal. The operation took an extremely short time here, too, because this adhesive is ready to use with no mixing needed. ULTRACOLOR, the fast-setting and quick-curing cement grout for joints 2 to 20 mm wide, was used to complete the installation. ❑

Technical data sheets for the products mentioned in this article are contained in Mapei Binder N° 1 "Ceramic Tile Line".

Tracks 1 and 2. In addition, the platform of Track 1 had to be waterproofed before installing the flooring. A 2 mm thick coat of MAPELASTIC, the two-part flexible cement mortar for waterproof protection of concrete, was applied over the MAPECEM screed. Waterproofing was easy, using a metal trowel and embedding a fiberglass mesh into the MAPELASTIC. After four days, when the substrate had hardened, it was possible to install the agglomerated marble tiles using, as before, GRANIRAPID.

Ceramic tile on the walls

ADESILEX P25, Mapei's ready to use paste adhesive, was used for installing

TECHNICAL DATA SHEET

Project: The Eurostar Railway Station at Brussels-Midi, Brussels, Belgium

Year of execution: 1992 to 1998, still under construction

Contractor: SCNB, Brussels

Architects: Eurostation

General Contractor for large-scale projects: AM CDC (Cit-Blaton/De Nul/CEI) CFE, Brussels

Floor and wall coverings: marble agglomerate by Marbra Lys, Harelbeke, and ceramic tiles from several manufacturers.

Mapei products used:
Installation products: MAPECEM screeds
Slurry mixed with: MAPECEM and PLANICRETE
Adhesives: GRANIRAPID and ADESILEX P25
Grout: KERACOLOR FINE GRAIN and ULTRACOLOR

Waterproofing products: MAPELASTIC

The Mapei products mentioned are part of Mapei's European product lines