

# Line 16-1 Paris Metro

## Project specifications

Project type: Subway tunnel  
Application: Precast segments

## Partners

- Owner: Société du Grand Paris (SGP)
- Designer: Egis
- Contractor: Eiffage Génie Civil
- Precast plant: Bonna Sabla



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The Grand Paris Express line 16 is the latest expansion of the Paris Metro. It is designed to connect the suburban stations and prevent the need to travel into central Paris and out again to reach urban destinations. The new line consists of 19.3 km (12 mi) of tunnels lined with precast segments reinforced with Dramix® 3D.

## The challenge

The diameter of the tunnel measures at 8.7 m (28 ft) on the inside and at 9.5 m (31 ft) on the outside. Because of the size and urban location of the project, time was of the essence. Precaster Bonna Sabla offers its customers optimum quality and productivity. Using Dramix® steel fibre reinforcement for the precast segments of the inner diameter enabled them to provide the quality at the speed they value.

## The solution

The concrete segments uses C50/60 concrete reinforced with 40 kg/m<sup>3</sup> of Dramix® 3D 80/60 BGP steel fibres. The fibres, with a tensile strength of more than 1800 MPA and a fine diameter (0.75mm), create a net of 11,6km of fibres/m<sup>3</sup> of concrete. The performance class according to MC2010 is achieved. The fibres are spread throughout the matrix of the concrete and guarantee extra reinforcement of the weak points in the segments (corners and edges). The entire project contains up to 5.200 ton of Dramix® steel fibres, making it one of Bekaert's biggest projects in Paris.