



## The Construction of Roadbed for the Double Track Gyeong-Ui Line in South Korea (From Yongsan to Munsan)

Gajwa Station - Platform



Group photo with Chairman and CEO S. Joon Kim

Construction cost  
**USD213 million**

**4,847**  
DAYS

**USD21 million**  
of profit

### Building Client Confidence from the Beginning of the Project

The Gyeong-Ui Line double track railway construction project threw us a great challenge and difficulties because we had to add second roadbeds in the existing 10.46 km of Gyeong-Ui Line to increase the daily train frequency from 26 times to 288 times while the

train had to operate normally on a daily basis. Under the circumstances, Ssangyong E&C built trust with the client by deploying employees with abundant field experience to pro-actively driving the construction process and providing professional design changes.



On-site tour by Singapore BCA and railway experts from home and abroad

## Double Crises Mean Doubled Opportunities

During the early stage of the construction, the initial plan was changed to build 1.5km of underground railway that ran through the city's center. Although receiving the client's permission on this change was difficult, Ssangyong E&C was able to obtain client approval by attracting active support from local residents and congressmen.

From September 2003, the underground section was being constructed using the Fast-Track method. However, in June 2007, the foundation of the retaining structure collapsed, resulting in a bedrock settlement of about 50 m. While Ssangyong E&C carried out restoration works to fill the ground, it proved that the cause of the bedrock settlement was a design problem and proceeded to make precise design changes.

About four months later, approximately 300m<sup>3</sup> of soil was lost due to abnormal ground conditions in the underground section, but Ssangyong E&C was able to make the recovery without any human or physical damages by taking speedy and decisive actions.

Moreover, through the use of more efficient construction techniques, the contract amount was increased by a total of USD21.6 million and construction cost was saved.

By successfully completing the project despite the two major crises, Ssangyong E&C showed that it can turn unforeseen crises rather into opportunities resulting in better cost environment and stronger trust from the client.

In October 2008, Ssangyong E&C staff had to fight through 3,000 tons of groundwater pouring down like a

waterfall every day while tunneling through the untreated gravel section.

At the construction site, pack micro piles were installed on existing lines to block groundwater, and service lines were controlled to install precise water walls.

As everyone devoted their best effort, finally we were able to pass through the gravel tunnel on September 1, 2011.

Along with this, the project won the Grand Prize in the in-house technology exchange event thanks to the design changes to TRcM (Tubular Roof Construction Method) and Trench Wall method. A patent was secured for this, and our staff members were able to increase the contract amount by USD1.4 million and secure construction profit totaling USD360 thousand. In December 2012, the second stage construction of Gyeong-Ui Line was completed and Ssangyong E&C was able to finish the whole construction by March 2014.

## 4,847 Drops of Sweat Marked the Birth of a New City

This period of 13 years and 4 months is filled with the passion of many employees who have been part of this site. Thanks to this, Ssangyong E&C accomplished 19 design changes, USD15 million of construction cost increase, 17.1% cost reduction, and USD21 million construction profit. And above all, we gained strong trust from the client.

In September 2016, Chairman and CEO S. Joon Kim awarded this site with an "Excellent Site" citation and congratulated the tireless efforts of the staff that went on for 4,847 days. **S**

### Overview

Project name: Gyeong - Ui Line (From Yongsan to Munsan)

Construction period: From December 22, 2000 to March 31, 2014 (159 months)

Construction cost: USD213 million

Client: Korea Rail Network Authority