

## Development of a Pre-Cast-Slab Track System (PSTS)

### Approval for operational testing

In a letter dated 03.01.2005, reference 21.61 lozb (567/04), SAMPYO KRT, 8F Korean Re Bldg 80, Su-song-Dong, Jongno-Gu Seoul, Korea, was granted approval for operational testing of the "PSTS frame" slab track system.

With this simple notification, the EBA (Eisenbahnbundesamt German Federal Railways Authority) described the most important milestone in the development of the new slab track system which is now approved for operational testing in Germany.

### A look back

In March 2004, several years after the event, Dr. Fricke, a participant in a delegation trip to Vietnam, contacted Krebs und Kiefer to ask if Krebs and Kiefer would be interested in using its expertise in slab track construction in Korea. As early as 31st March, a Korean delegation visited Krebs and Kiefer to exchange information on this subject.

After intensive negotiations, Krebs und Kiefer was commissioned in June 2004 by the South Korean construction group SAMPYO to develop a slab track system. A pre-stressed pre-cast concrete unit was to be developed as a supporting slab for high-speed railway tracks in what was to be known as the "Pre-Cast Slab Track System" or PSTS.

No relevant experience with railway slab systems for tracks was available in South Korea, so it was necessary to take advantage of German know-how. This was a precondition set by Korean state railways for approval of the system in South Korea. SAMPYO had full confidence in our experience of planning slab tracks for high-speed lines.

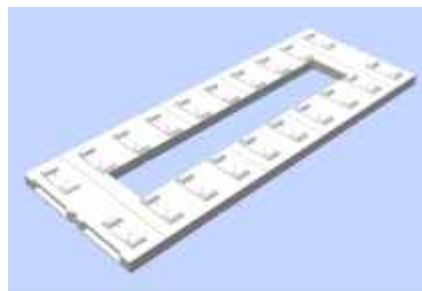


*PSTS Frame at the SAMPYO factory*

The new system had to be more cost-effective than any other known construction and at the same time, combine all the experience gained from the German railways test sections in Dachau-Karlsfeld and Hösbach station and their advantages with those of railway slab systems approved in Japan.

A very intensive planning process followed, involving experts like Prof. Dr.-Ing. Leykauf from Munich Technical University, and Dr.-Ing. Mattner and Dipl.-Ing. Steinkohl from the EBA in Munich.

The result was a frame-like pre-stressed pre-cast concrete unit for high-speed railway lines, the PSTS Frame.



*3D-visualization of PSTS Frame*

### Client

SAMPYO E&C,  
Seoul, Korea

### Object planning and structural design

Krebs und Kiefer,  
Hilpertstraße 20,  
64295 Darmstadt

### Expert report

Prof. Dr.-Ing. Günter Leykauf,  
Munich University

### Duration of planning

1 year

### Invoice value

Ca. 400.000 EUR

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By obtaining approval for the new system, Krebs und Kiefer successfully fulfilled both the German and Korean requirements. SAMPYO in South Korea was also put in a position to produce the pre-cast PSTS Frame itself.

The first sample units have now been produced and presented to the public in South Korea.

Further optimizations of the PSTS Frame are currently still being tested at Munich Technical University and in South Korea.

Preparations for their installation on the test section in South Korea are in full swing. Here, the new system will once again be tested thoroughly under operational conditions.

The objective is to use the PSTS Frame on the second section of the Korean high-speed railway line. A first proposal for its use on a test section in China in cooperation with a Chinese construction firm has also been made.



*PSTS Frame with a variety of rail supports*

Many documents were produced in English and explained to the Korean colleagues during several meetings in Seoul, Korea.

We would also like to emphasize the hospitality and kindness of our Korean client, Mr. Chairman Chung and Mr. President Cho, whose support was a key factor in the success of this joint project.

### Project data

- Development of a slab track system for railways consisting of coupled pre-stressed pre-cast concrete units
- Expert report by Munich Technical University
- EBA approval procedure
- Dr.-Ing. Mattner, Munich

### Krebs und Kiefer services

- Preliminary study
- Design
- EBA approval
- Execution planning
- Materials testing procedures
- Cost comparisons



*Coupled joint*

The committed team in Korea, led by Ms. Oh and Dr. Fricke, deserves special mention, having successfully learned the “peculiarities” of the German regulations and principles in a very short time.



*Adjusting device*