

# HIGH-SPEED TURNOUTS WITH CONCRETE TRACK SYSTEM (SPEED OVER 300 Km/H)

Gerard THOREZ\* Francesco BARRESI\*\* Romuald SALOT\*\*\* Park, Choon-Bok\*\*\*\*

---

## ABSTRACT

In collaboration with SAMPYO KRT, VOSSLOH COGIFER has designed and supplied all turnout for the first Korean high speed project.

The track is laid on ballast and the turnout were designed accordingly and as per the SNCF standard for turnout at commercial speed of 300 km/h and design speed of 350 km/h.

KNR has now decided to implement a ballastless technology for the extension of the line between (South line). To the best of our knowledge, it has also been decided that the system to be used is ballastless Concrete bearer. Thus, the following presentation has been done with a technology for ballastless track with the same system.

---

## 1. Introduction

In collaboration with SAMPYO KRT, VOSSLOH COGIFER has designed and supplied all turnout for the first Korean high speed project.

The track is laid on ballast and the turnout were designed accordingly and as per the SNCF standard for turnout at commercial speed of 300 km/h and design speed of 350 km/h.

KNR has now decided to implement a ballastless technology for the extension of the line between (South line). To the best of our knowledge, it has also been decided that the system to be used is concrete bearer with ballastless track. Thus, the following presentation has been done with a technology for ballastless track with the same system.

## 2. Presentation of our technical solution

In order to be as homogeneous as possible, the solution we are proposing will be designed with the concrete bearers perfectly suitable for ballastless track as well as fastening system.

In order to reduce the quantity of components for maintenance purposes, all main items such as switch points, stock rails, movable point frog will remain the same as the existing turnout currently in use for the first section.

For safety reasons, the locking systems as well as the driving mechanism will remain the same.

For signaling purposes, and for compatibility reasons, all switch motors, point detectors will remain strictly identical to the first section Seoul Pusan.

---

\* VOSSLOH COGIFER , Commercial Director

\*\* VOSSLOH COGIFER , Technical Director

\*\*\* VOSSLOH COGIFER , Signaling Sales Manager

\*\*\*\* SAMPYO KRT, Research Institute General Manager

### 3. Technical description of section at the switch area.

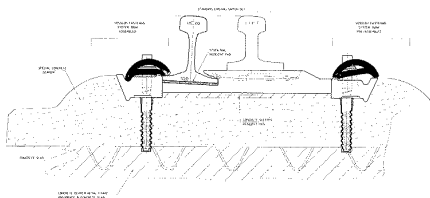


FIG. 1. Switch part section area

For economical reasons and to reduce the quantity of items necessary for spare parts, we are proposing a design strictly identical to the turnouts already supply for the existing line.

All components which are part of the switches (SP, SR, bolts, nuts, cast stops, ) will remain the same. Consequently, the KNR's maintenance department will be able to use the same switches on both type of track, ballasted and ballastless.

- Switch point UIC60 D (strictly identical to the existing turnout)
- Stock rail UIC 60 (strictly identical to the existing turnout)
- Slide chairs IBAV (adapted for fastening system)
- Concrete bearers (suitable for ballastless track system)
- Canted 1/20 technology

### 4. Technical description of section at locking device area

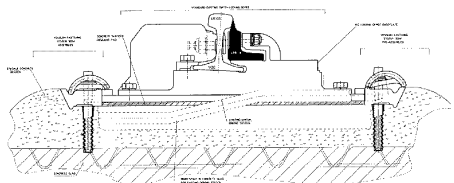


FIG. 2. Section at locking device area

As for all the 900 high speed turnouts already supply all over the world, including Korea's first high speed line, the turnouts we are proposing will be equipped with the VCC locking device. This system allows to lock both switch point individually in both open and closed position. It is certainly the safest device in regards of locking of switch points with a perfect safety records on all high speed lines in service for more than 20 years and at commercial speed over 300 km/h.

It is also important to point out that all detectors will be the same as the first section allowing a perfect compatibility for the signaling system.

### 5. Technical description of section at the embedded area

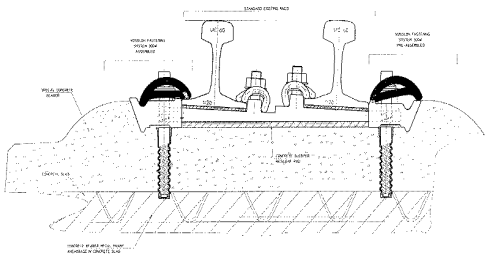


FIG. 3. Section at the embedded area

Our design at the embedded area will be identical to the existing turnouts and obviously of a proven technology for very high speed.

## 6. Technical description of section at the movable point frog area

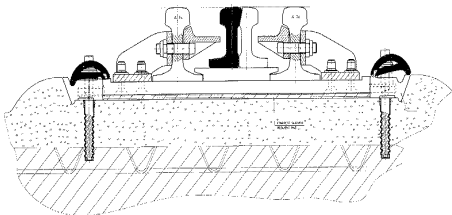


FIG. 4. Section at the movable point frog area

With the same philosophy of our design in the switch area, the movable point frog we are proposing will be identical to the existing turnouts. The locking of the point and point controller will be identical thus perfectly compatible with the existing signaling system.

- Manganese cradle (strictly identical to the existing turnout)
- Point and counter point 60D (identical to the existing turnout)
- Concrete bearers (suitable for ballastless track system)
- Canted 1/20 technology

## 7. Conclusion

For obvious reasons, we believe that it is critical to design the very high speed turnouts for the south extension using as many components as possible identical to all turnouts already installed on the North line.

In regards of the locking and detectors, our design proposal will guarantee a safe and efficient interface with the existing signaling system.

Assuming that the ballastless track system will be adopted for all sections, our proposal for turnouts is based on the same system. Consequently, the whole track (main track / turnouts) will be homogeneous.

Such concept of turnouts has already fully engineered and has been approved by the homologation body of the German railway, EBA.