

**Development of a Solid-bed Track with Resilient Sleepers using the Shear-key
to Achieve Efficient Construction Work**

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The solid-bed track with resilient sleepers (STR) is one of the ballastless tracks in which the sleeper with under sleeper pads is supported directly by the concrete trackbed. The STR is not only very effective in saving maintenance work, but also useful for reducing structure borne noise and ground vibrations. However, there have been demands for increasing the construction speed and reducing its cost. For that purpose, by introducing the shear-key on each side of the sleepers to resist lateral loads, we developed a new S-type STR in which the concrete trackbed was narrowed. Full scale loading tests and non-linear FEM analyses were carried out, and the results confirmed that the new structure had sufficient performance. S-type STR was actually applied to a railway company, and it was confirmed that compared to the existing STR, S-type STR could be built the concrete trackbed at 60% less cost, resulting in reduction of the overall track construction cost down by 20%. In addition, the narrowed concrete trackbed speeded up track laying time 1.7 times, reducing construction time.