

Method For Producing A Slab Trackway

5 The invention relates to a method for producing a slab track
for rail vehicles with an emergency pathway for road
vehicles wherein a prefabricated track section with rails
and sleepers is supported and positioned on a substructure
by means of a supporting and aligning device and a track
10 slab is produced by casting in the sleepers.

Slab tracks for rail vehicles are known in the art and are
preferentially used in tunnels. To ensure quick rescue in
the event of accidents and disturbances, such tracks are
15 provided, particularly in tunnels, with emergency pathways
that are drivable for road vehicles and of course also
walkable for pedestrians. A requirement with regard to the
latter is that tripping points are eliminated as far as
possible.

20 Known emergency pathways consist of prefabricated plates,
e.g. of concrete, resting on a track slab of filling
concrete in which the sleeper blocks are embedded. In the
case of tracks with elastically supported, vertically
25 movable sleeper blocks, an additional requirement is that
the plates of the emergency pathway do not hinder the
mobility of the sleeper blocks. An advantage of such
emergency pathways is that the dimensions and the weight of
the prefabricated plates can be designed such that the
30 plates can be transported and laid by conventional means.
However, a disadvantage is that the dimensions of the plates
have to be adapted to the gauge, the sleeper block
dimensions, the sleeper block spacing, and the slope of the

filling concrete track slab. A slope is required to drain water. All these variable parameters make it uneconomical to keep a stock of prefabricated plates. A further disadvantage of emergency pathways of this kind is that the plates often
5 do not rest stably on the filling concrete track slab so passing vehicles cause a tilting movement and the plates are thus subject to high local wear.

Embodiments of the invention seek to provide a method for
10 producing a slab track for rail vehicles with an emergency pathway for road vehicles that may be simple and cost-efficient to implement and that may result in a slab track provided with a positionally stable emergency pathway having a high load capacity.

15 According to a first aspect of the present invention, there is provided a method for producing a slab track for rail vehicles with an emergency pathway for road vehicles wherein a prefabricated track section with rails and sleepers is
20 supported and positioned on a substructure by means of a supporting and aligning device and a track slab is produced by casting in the sleepers, characterised in that the part of the sleepers that projects from the track slab and the rails are separated by formwork elements and an emergency
25 pathway is applied to the track slab by casting.

As disclosed, the part of the sleepers that projects from the track slab and the rails are separated by formwork elements and an emergency pathway is applied to the track
30 slab by casting.

In particular, this method may offer the advantage that the emergency pathway precisely fits onto the track slab and rests thereon stably. Furthermore, the need for prefabricating and more particularly keeping a stock of
5 plates for the emergency pathway may be eliminated.

According to one embodiment of the method, the formwork elements are attached before the track slab is cast. This *modus operandi* may offer the advantage that it is not
10 necessary to step on the track slab to attach the formwork elements after casting the track slab and that the emergency pathway may possibly be applied before the track slab has completely hardened.

According to a further embodiment of the method, the supporting and aligning device is removed before the emergency pathway is cast. This may have the advantage that no parts or traces of the supporting and aligning device
5 remain in the emergency pathway.

According to a second aspect of the present invention, there is provided a slab track produced according to the method defined in the first aspect.

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In one embodiment of the slab track, a drainpipe is arranged in the substructure and communicates with the surface of the substructure via connecting openings provided in the substructure at certain intervals. A substructure prepared
15 in this manner may eliminate the need for the subsequent installation of a drainage system.

According to a further embodiment, the track slab is provided with connecting openings which communicate with the
20 connecting openings provided in the substructure. It is very simple to provide the track slab with such connecting openings, e.g. by inserting formed parts before the track slab is cast.

25 According to another embodiment, the emergency pathway is divided by joints extending substantially transversely to the rails. These joints absorb expansions and contractions of the emergency pathway. Furthermore, this may allow an easy stepwise manufacture of the emergency pathway in
30 accordance with the length of the prefabricated track sections.

According to a further embodiment, the emergency pathway is provided with drainage shafts which communicate with the

connecting openings of the track slab. These drainage shafts are preferably arranged in the area of the joints and may ensure the drainage of water from the emergency pathway.

- 5 If according to another embodiment the surface of the emergency pathway is provided with drainage channels, the drainage of the emergency pathway may be further improved.

According to a further embodiment, the sleepers have a
10 heightened shoulder on at least one side of the rail whose surface is at least approximately flush with the surface of the emergency pathway. In this manner, gaps in the emergency pathway that might otherwise remain after removing the formwork elements may be largely closed.

15 According to a third aspect of the present invention, there is provided a formwork elements for implementing the method as defined in the first aspect, wherein they consist of hoods that are intended to be fitted over parts of the
20 sleepers and of plates connecting adjacent hoods. These elements may allow a quick setup and removal.

According to embodiments of the invention, the formwork elements consist of hoods that are intended to be fitted
25 over parts of the sleepers and of plates connecting adjacent hoods. These hoods and plates may be quickly mountable and dismountable and may be furthermore reusable.

According to one embodiment of the formwork elements, the
30 plates are removably connectable to the hoods. This measure may also facilitate the mounting and dismounting of the formwork elements.

According to a further embodiment of the formwork elements,
35 the plates are connectable to the hoods such that the

spacing between adjacent hoods is variable. This may eliminate the need for providing plates of different lengths in accordance with different sleeper spacings.

5 Exemplary embodiments of the invention will be described in more detail hereinafter by way of examples with reference to the appended drawings. The latter show

10 Figures 1 to 6 six steps of an embodiment of the method according to the invention in respective sectioned views taken transversely to the travel direction,

Figure 7 a perspective view of a pair of formwork hoods,

15 Figure 8 a perspective view of a rail section with fitted and interconnected formwork hoods, and

Figure 9 a perspective view of a section of a slab track according to the invention.

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In Figure 1, the initial situation in an embodiment of the method according to the invention is illustrated by way of example. A track section consisting of a plurality of sleeper blocks 5 and of rails 8 mounted thereon is supported
25 and aligned on a substructure 1, e.g. of reinforced concrete, by means of a supporting and aligning device 4. In the substructure extends a drainpipe 2 that communicates with the upper side of substructure 1 via connecting openings 3 arranged at certain intervals. In order to damp
30 vibrations produced later when vehicles are passing on the track, a respective rubber shoe 6 in which an elastic inlay 7 is arranged is fitted over the bottom of each sleeper block 5. As appears in the Figure, sleeper blocks 5 are

provided on both sides of rail 8 with upwardly projecting shoulders 24 whose upper surfaces are walkable or drivable for road vehicles later in the finished track. The invention is not limited to a track including sleeper blocks 5 of this
5 kind, however.

In the illustration according to Figure 2, a respective formwork hood 9 is fitted over each sleeper block 5 whose purpose it is to prevent the access of concrete to sleeper
10 blocks 5 and rails 8 during the subsequent casting of an emergency pathway 12 (Figure 5). As a further measure before casting track slab 10, the placement of formwork elements may possibly be required in the area of the lateral edges of the substructure. These formwork elements may consist of
15 known formwork panels and are not shown in the Figures.

Figure 3 shows the situation after the casting of track slab 10, which may e.g. consist of non-reinforced concrete. Basically, formwork hoods 9 might be fitted after the
20 casting of track slab 10 also. However, fitting them beforehand, as shown in the Figures, offers the advantage that it is not necessary to step onto track slab 10 to fit formwork hoods 9. Track slab 10 has connecting openings 11 for drainage that are arranged at certain intervals and
25 aligned with connecting openings 3 mentioned with reference to Figure 1. Connecting openings 11 can be obtained in a known manner by inserting corresponding parts.

Figure 4 only differs from Figure 3 in that the supporting
30 and aligning device 4 has been removed in the stage according to Figure 4. Starting from the situation depicted in Figure 4, an emergency pathway 12 can now be cast as

illustrated in Figure 5. Non-reinforced concrete may be used for emergency pathway 12 also.

Figure 6 shows the condition of the track after the removal
5 of the formwork hoods. Transversely to the track, emergency pathway 10 is divided into blocks, and a joint is arranged between two respective emergency pathway blocks, as will become clearer below in the description of Figure 9. Drainage shafts 23 are arranged between two respective
10 emergency pathway blocks and aligned with underlying connecting openings 11.

Furthermore it is clearly visible in Figure 6 that shoulders 24 of sleeper blocks 5 are flush with surface 25
15 of emergency pathway 12. In this manner, gaps as they would remain in emergency pathway 12 in the case of conventional sleeper blocks without heightened shoulders after removing the formwork hoods are closed by shoulders 24 to such an extent that a risk of accidents is largely eliminated.

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Figure 7 shows a pair of formwork hoods 9 in a perspective view. Each formwork hood 9 has two side walls 13, 15, a rear wall 14, and a top wall 16 and is open on the side that is to face rail 8. On both side walls 13, 15, connecting parts
25 17 with bolts 18 are arranged that are intended for fastening a connecting plate 19 (Figure 8). Formwork hoods 9 may consist of sheet metal, synthetic material, wood, or another suitable material. To allow formwork hoods 9 to be removed by lifting them off after the concrete of emergency
30 pathway 12 has hardened, they have a slightly conical shape. This means that side walls 13, 15 and rear wall 14 are inclined about 3 degrees relative to the vertical so that the formwork hood tapers from the top to the bottom.

Figure 8 shows a section of a rail 8 with three sleeper blocks 5 covered with formwork hoods 9. Also clearly visible in this Figure are connecting plates 19 each connecting two
5 respective formwork hoods 9. To fasten connecting plates 19 to connecting parts 17 of formwork hoods 9, connecting plates 19 are provided with openings 20 in which bolts 18 provided on connecting parts 17 engage. Connecting plates 19 serve the purpose of preventing that the concrete of
10 emergency pathway 12 may reach rail 8 while it is still flowable. With regard to connecting plates 19, different embodiments of formwork hoods 9 may be contemplated. Thus, instead of connecting parts 17, grooves may be provided in side walls 13, 15 of formwork hoods 9, in which connecting
15 plates 19 can be inserted. Also, two short connecting parts may form an elongated gap between them that has the same function as a groove. Alternatively, connecting plates 19 may be permanently connected to respective formwork hoods 9 and extend to the adjacent formwork hoods 9.

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Figure 9 shows a perspective view of a track section. From bottom to top, substructure 1, track slab 10, and emergency pathway 12 are visible. It is also clearly visible that a clearance is left between emergency pathway 12 and sleeper
25 blocks 5 and rails 8. Shoulders 24 of sleeper blocks 5 are substantially flush with the surface of emergency pathway 12 so that no major openings remain in the emergency pathway in these locations that might result in a risk of accidents particularly for pedestrians. Between two respective
30 sections of the emergency pathway there is a joint 21, and a drainage channel 22 extends centrally between rails 8 in parallel to the latter. Between two respective sections of emergency pathway 12, a vertical drainage shaft 23 is formed

into which drainage channel 22 opens. Drainage shaft 23 is connected to drainpipe 2 by connecting openings 3 and 11 (see e.g. Figure 6).

List of Reference Numerals

- 1 substructure
- 2 drainpipe
- 3 connecting opening
- 4 supporting and aligning device
- 5 sleeper block
- 6 rubber shoe
- 7 inlay
- 8 rail
- 9 formwork hood
- 10 track slab
- 11 connecting opening
- 12 emergency pathway
- 13 side wall
- 14 rear wall
- 15 side wall
- 16 top wall
- 17 connecting part
- 18 bolt
- 19 connecting plate
- 20 opening
- 21 joint
- 22 drainage channel
- 23 drainage shaft
- 24 shoulders of 5
- 25 surface of 12
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Claims

- 5 1. Method for producing a slab track for rail vehicles
with an emergency pathway for road vehicles wherein a
prefabricated track section with rails and sleepers is
supported and positioned on a substructure by means of a
supporting and aligning device and a track slab is produced
10 by casting in the sleepers, characterised in that the part
of the sleepers that projects from the track slab and the
rails are separated by formwork elements and an emergency
pathway is applied to the track slab by casting.
- 15 2. Method according to claim 1, characterised in that the
formwork elements are attached before the track slab is
cast.
3. Method according to one of the preceding claims,
20 characterised in that the supporting and aligning device is
removed before the emergency pathway is cast.
4. Slab track produced according to the method according
to one of the preceding claims.
- 25 5. Slab track according to claim 4, characterised in that
a drainpipe is arranged in the substructure and communicates
with the surface of the substructure via connecting openings
provided in the substructure at certain intervals.
- 30 6. Slab track according to one of claims 4 to 5,
characterised in that the track slab is provided with

connecting openings which communicate with the connecting openings provided in the substructure.

7. Slab track according to one of claims 4 to 6,
5 characterised in that the emergency pathway is divided by joints extending substantially transversely to the rails.

8. Slab track according to one of claims 6 to 7,
characterised in that the emergency pathway is provided with
10 drainage shafts which communicate with the connecting openings of the track slab.

9. Slab track according to one of claims 4 to 8,
characterised in that the surface of the emergency pathway
15 is provided with drainage channels.

10. Slab track according to one of claims 4 to 9,
characterised in that on at least one side of the rail the sleepers have a heightened shoulder whose surface is at
20 least approximately flush with the surface of the emergency pathway.

11. Formwork elements for implementing the method according to one of claims 1 to 4, characterised in that
25 they consist of hoods that are intended to be fitted over parts of the sleepers and of plates connecting adjacent hoods.

12. Formwork elements according to claim 11, characterised
30 in that the plates are removably connectable to the hoods.

13. Formwork elements according to claim 12, characterised in that the plates are connectable to the hoods in such a manner that the spacing between adjacent hoods is variable.