

Project: "Clearance optimisation for Stern & Hafferl rail systems"

Client: Stern und Hafferl Verkehrsgesellschaft m.b.H.

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Project Duration: 2016 - 2017

Project Brief:

The given task was to provide optimised clearance diagrams for the meter gauge sections in Stern & Hafferl's branch-line and tramway systems. The existing fleet vehicles, as well as the newly acquired Tramlink vehicle, had to be examined in order to determine their respective construction gauges, based on the different types of track superstructure. As a result of this examination, new and optimised construction gauges were calculated and defined respectively.

From the newly calculated construction gauges, new clearance diagrams were derived for the abovementioned rail systems, for fixed and ballasted superstructures respectively. As a basis for the definition of optimised clearance diagrams, we used the rail parameters provided by Stern & Hafferl, as well as the construction gauges that we had calculated.

In order to optimise the construction gauges and, consequently, the clearance diagrams, we used the BOStrab guidelines from December 1996 ("Dimensioning Track Clearance") as a calculation base. However, due to the fact that these guidelines were formulated for conventional bogie vehicles, the calculation methods and formulas had to be adapted, especially for the historic two-axle and the more modern articulated vehicles. What is more, the respective calculations for the two different superstructures (ballasted and fixed) were evaluated separately for the sake of optimisation.

In the provided documents, we have also outlined additional travelway space (e.g., hazardous and safe areas, room for operation) as well as safety margins that need to be taken into consideration in order to fully comply with various regulations (EisBAV / StrabVO). Regulations and standards were indicated, and all parameters were met.

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Task Description:

1. Preparation for construction gauge calculations:

- Taking measurements and surveying the historic vehicles
- Defining adequate calculation methods by adapting the calculation base to the various different vehicle-geometries
- Detailed measurement of critical vehicle parameters, following an initial calculation
- Detailed calculation and optimisation of the applied calculation methods

2. Project implementation:

- Development of a calculation matrix for 12 different types of vehicles
- Creating clearance diagrams for two different rail systems, and two different kinds of track superstructure
- Compiling the respective vehicle documentations, including operational requirements
- Development of clearance diagrams and documents for the abovementioned rail systems and track superstructures