Summary

In early port design Royal Haskoning would like to make an educated guess about the optimal dimensions for stacking yards and the required Rubber Tyred Gantries (RTG's) without making use of simulations. RTG's are flexible overhead cranes that move over long rows of stacked containers (the yard) that are temporarily stored before continuing to its next destination. Each port design request is unique and would require time consuming and expensive programming to build a customized simulation model.

Through analytic reasoning this report derives a model, given basic terminal design requirements, which advises on optimal dimensions and investment. A software tool was developed which executes the model and the necessary simulations. The model was developed while keeping in mind the requested generality.

This report is in succession of an earlier research done by F.G. van der Wal. His report resulted in a solid foundation but lacked coverage of the whole system and was therefore not yet useable in practice. This research extends the research initiated by F.G. van der Wal and makes some improvements. The interested reader is referred to his eponymous report.

Where possible analytical functions were derived. More complex problems like calculating the time to do necessary shuffles to retrieve a specific container could only be calculated through simulation. The software tool encompasses both approaches to conclude a final answer. In the last form one can easily retrieve all results in a clear manner.

Ultimately two important conclusions are drawn, the first of which is in contrast with nowadays practice.

> ➢ Wider RTG's result in need for less RTG's and lower surface area, both leading to decrease in investment costs. An optimal configuration is determined for a specific case.
> ➢ Dedicated RTG's result in less moves and therefore lower costs.

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