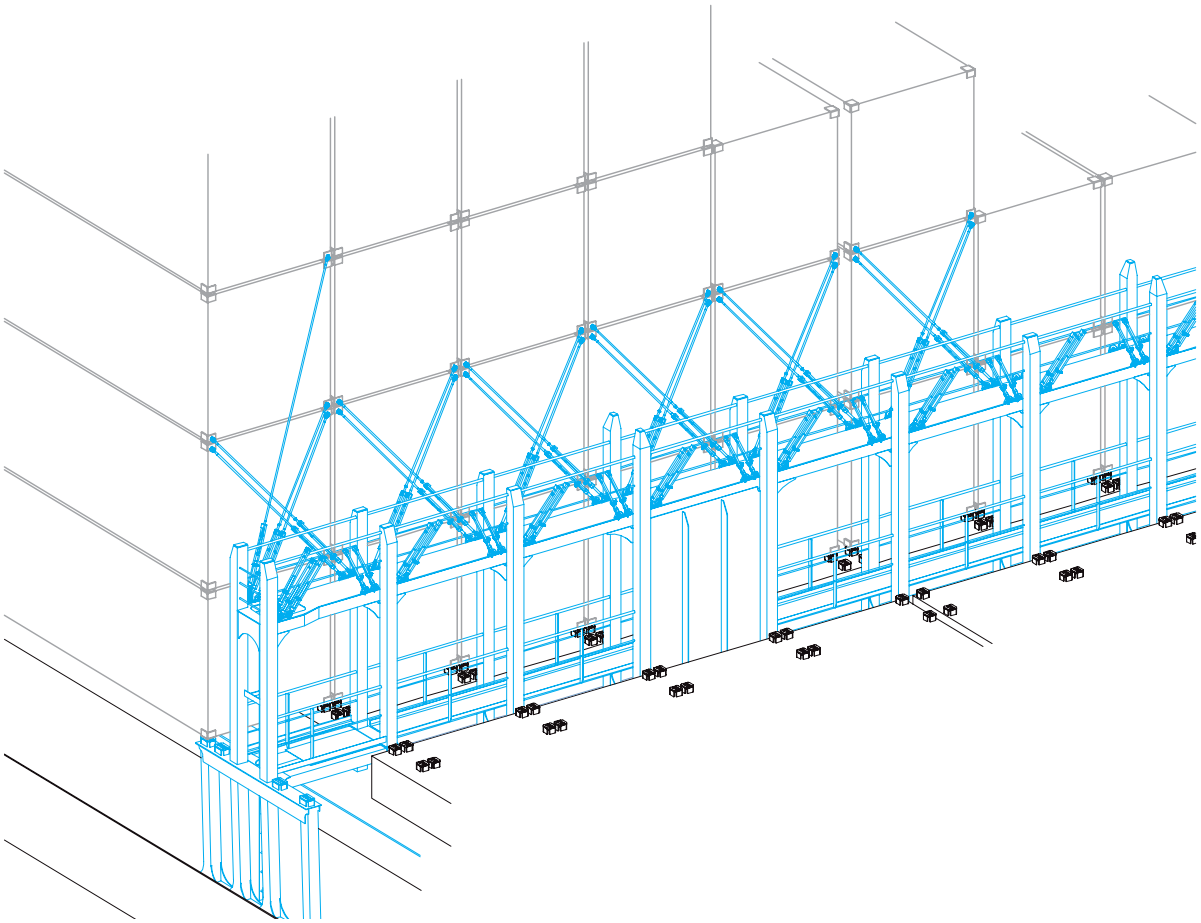
LASHING BRIDGES



Description

When the requested stackload for 40' containers is exceeding the limit of approx. 100 tons lashing from hatch cover level might no longer be sufficient. For this reason lashing bridges are installed between 40' hatches in order to realise more effective support by the lashings. Higher container weights can be realised in the upper tiers while the lashing system can be simplified, i. e. double cross short lashing system (Para-Lash) to be used for 40' containers from lashing bridge level. Heavy and unhandy long lashing bars should not be used except at some outermost stacklocations. The installation of lashing bridges does not have any effect on 20' stackloads because 20' containers still have to be lashed from hatch cover level at midhatch position. The possibility to stow non-standard containers others than 20'/40' ISO containers is restricted. For example 45' containers can be loaded on top of two tiers 40' containers otherwise they would interfere with the lashing bridge structure. Alternatively the length of hatch covers can be increased and additional foundations for 45' containers to be arranged. It has to be kept in mind when elongating the hatches lashing operation of 40' containers will become more difficult due to increased gap between lashing bridge and 40' container end.

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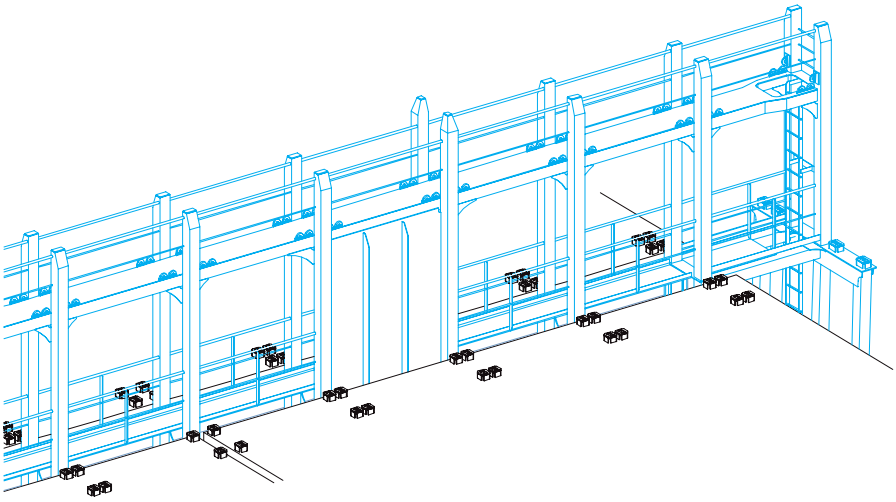

Another positive effect of lashing bridges is easy access to reefer containers at second tier. Many subjects have to be considered when designing a lashing bridge:

- At first the layout of transversal hold beam has to be checked together with yard and hatch cover designers considering guiding system of hatch cover panels, arrangement of bearing pads and lifting stoppers, sliding range of hatch covers due to ship's torsion, installation tolerances, minimum breadth of walkways, strength of lashing bridge etc.
- The longitudinal gap between lashing bridge and container end to be minimised therefore all containers should be arranged symmetrically on hatch covers.
- Also at this stage the arrangement of reefer socket and parking positions for loose lashing gear has to be considered.
- Next thing is the optimised arrangement of lashing plates on lashing bridge in order to ensure unified length of lashing rods. Preferably fixed lashing plates are used on lashing bridges instead of slewing eyes because of lower costs and no maintenance work. In the case that an average angle of inclination for the lashing plates which covers all lashing combinations and container heights/sizes can not be found slewing eyes can not be avoided.
- Some classification societies are requesting a detailed investigation considering three dimensional lashing, deflection of lashing bridge and shifting of hatch cover panels. These calculations can no longer be performed with standard lashing programs instead FEM to be used.

