

Conceptualization of the linen material flow and integration into the design process of a cruise ship

A proposal for a more efficient use of space for housekeeping on the decks with a guideline on how to account for necessary facilities during the design of a ship.

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Image 1 Picture of the Spectrum of the Seas: a ship built by Meyer Werft, <https://www.meyerwerft.de/de/presse/medienpool/index.jsp#>

This thesis, shaped together with leading shipbuilder MEYER WERFT, addresses the interplay between the linen flow and the contemporary facilities on cruise ships. Current procedures suffer from additional movements due to not optimally placed stores on the decks, leading to a proposal for using an automated Linen Lift system. If integrated into the ship design, this concept promises benefits on the side of the shipping company and the shipbuilder.

The Linen Lift, transporting fresh linens from the main store to passenger decks, allows cabin stewards to access linens as needed, reducing unnecessary back-and-forth trips and ensuring linens are always available. Figure 1 summarizes the movements happening on the decks.

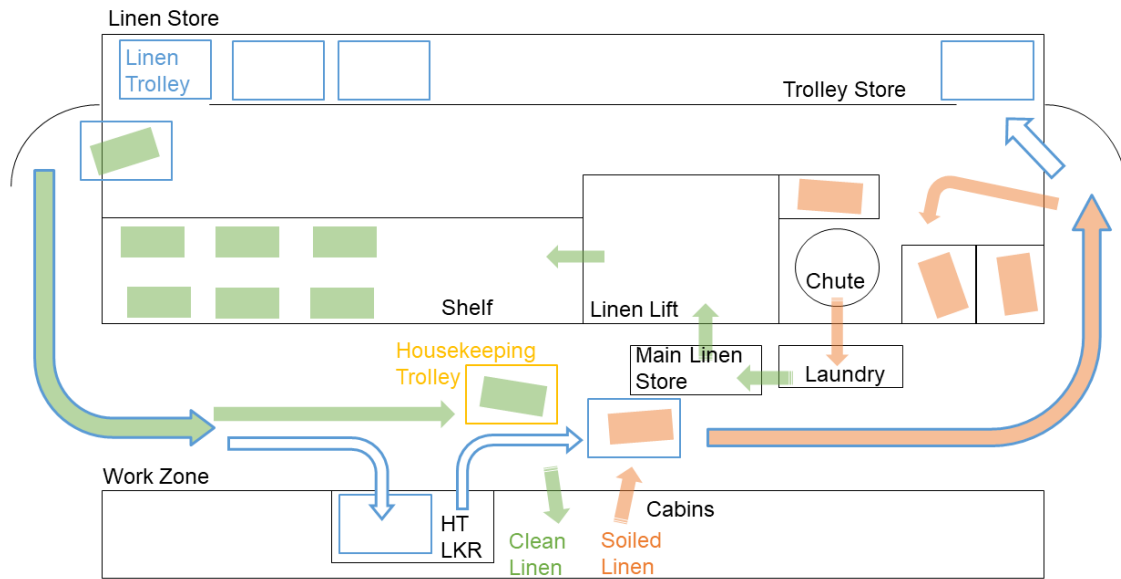


Figure 1 A sketch of the designed linen flow showing facilities and movements

The flow is built around the automated Linen Lift that delivers the fresh linen from the main store to the passenger decks just in time. Here, the cabin stewards can continuously pick the linen they need and transport it to their work zone. The trolley they previously used for the clean linen can also be used to collect the dirty linen from the cabins. When the trolleys are full, they are pushed to the Linen Chute close to the Linen Lift. Before being thrown down towards the laundry, the linen is sorted into three piles: terry towels, bed linen, and bathrobes. On the way back to the work zone, the cabin stewards can take new fresh linen and avoid an idle walk.

The integration of this innovative linen flow concept into the ship design process involves careful planning and coordination to optimize space and resource use. Important thereby is that the concept is already addressed during the sales negotiations and that the accompanying facilities are taken into account as soon as possible. For example, determining the placement of the Linen Lift and Linen Chute shafts must be done in conjunction with other ship components like staircases and Service Lifts. Sizes also depend on the number of work zones per deck, which depends on the arrangement of the cabins.

The potential benefits are space and time savings and reducing the need for manual labor, making operations more efficient on the operating ship. This concept also prevents late changes to the layout of a ship during the planning phase and allows for a faster installation of the stores on deck.

However, challenges and limitations are acknowledged. Technical constraints need to be addressed, especially regarding the automated Linen Lift system. Although calculations have shown that deck space could be reduced by up to 40%, the overall changes and potential challenges remain uncertain. Further detailing and understanding of the technical aspects are necessary.

There are lessons to be learned from this project that can already be applied to the design of ships today. Effective communication and detailed discussions about aspects like store sizes during contract negotiations are crucial to align expectations between the client and the shipbuilding company. Additionally, engineers can now use the knowledge gained from understanding facility usage to improve ship layout and design.