

A conventional Car Carrier design means that the vertical side webs are in line with the deck transverses (see Figure 1-1). This means that transverse forces on the decks will induce bending of the deck transverses. Consequently, the frame section (vertical side and transverse deck girder) is rigid when exposed to transverse forces, compared to the hinged deck design. A considerable fraction of the racking moment created above the bulkhead deck (freeboard deck) is then mainly to be carried by the frame section itself.

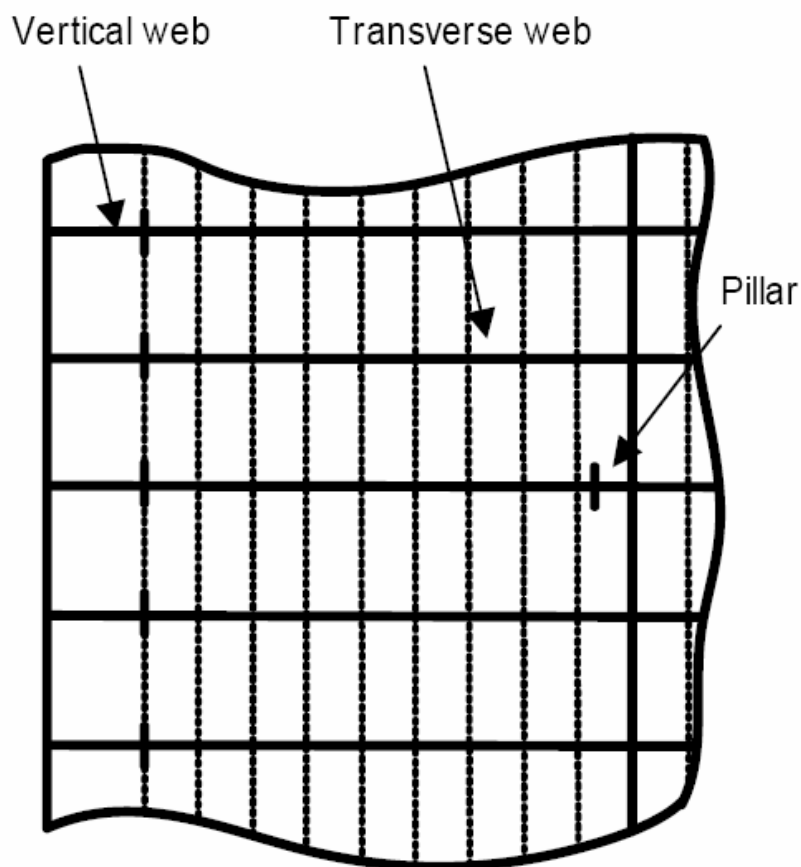


Figure 1-1
Typical deck plan for conventional (rigid deck design) car carrier

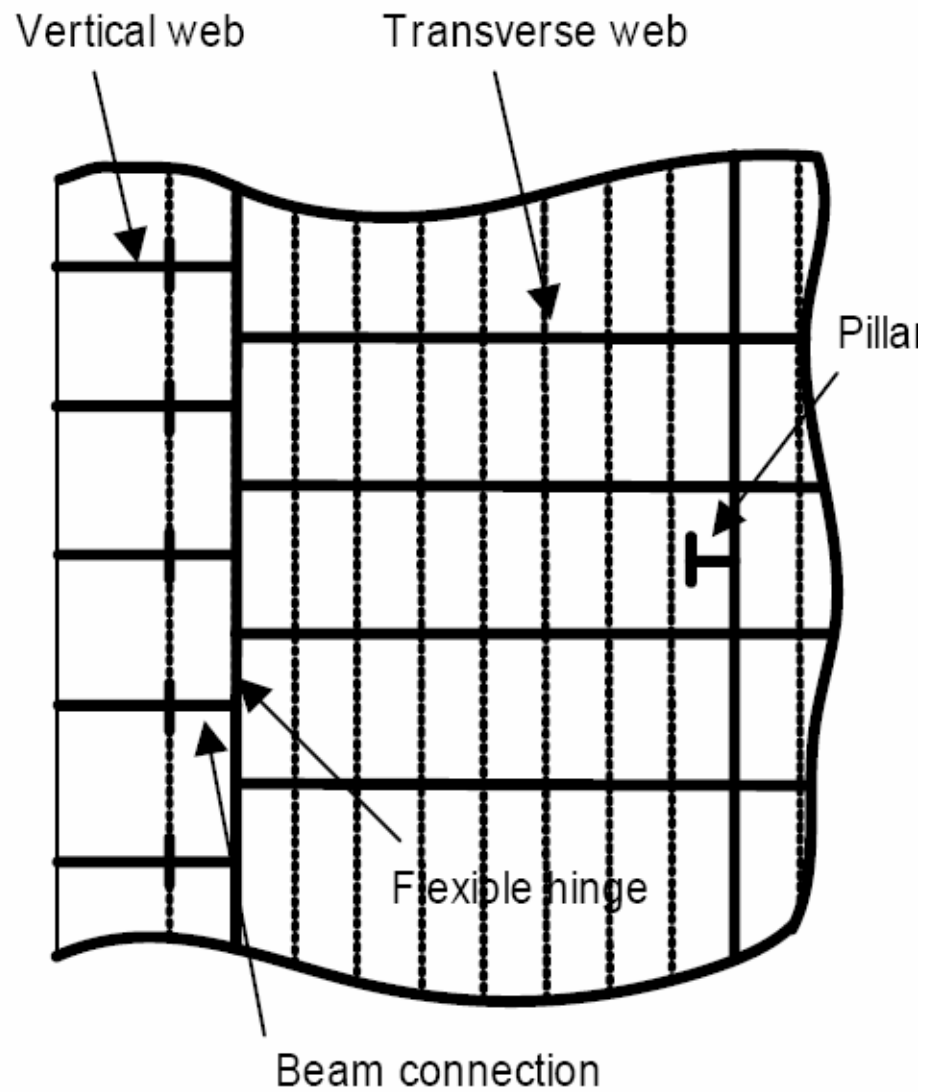


Figure 1-2
Typical deck plan for hinged deck design car carrier

1-2). This means that no bending moment is induced in the transverse deck girder when the deck is exposed to transverse forces. The vertical side frame will then deform as a cantilever beam supported at the freeboard deck and is only able to carry a reduced portion of the racking force on the transverse frame. The bow region and the stern are then activated and contribute as racking constraining structure together with other main structure such as engine casing, deep racking web(s) and strengthened ventilation trunks.

The longitudinal closest to the ship side should have low torsional stiffness (i.e. flat bar is preferred) and the distance between the longitudinal and the face plate of the side girder should be made as small as possible. Further, the longitudinal is supported in the side girders by short flanged beams with sufficient web height.

1.4.4

A hinged deck Car Carrier design means that the vertical side frame is not in line with the deck transverse girder (see Figure