

RoRo

Ramp covers

Planning the ramp cover

Our aim is to design a MacGregor ramp cover which is efficient, economic and safe, while fully meeting the specific operating requirements.

The more information that can be given on these prerequisites, the greater the chance to find the optimum solution. Under the following headings information requirements can be found before commencing the project.

If these answers are available at the earliest stage possible, work will be saved during the later stages, gaining valuable time by shortening the lead time between initial contact and delivery.

Ramp cover length

In order to establish the length of the ramp cover, we require drawings of the fixed ramp below the cover, showing gradient and radius or knuckle angles at both upper and lower ends, as well as height between the two decks and clear height. Please indicate the total vehicle height, height and ground clearances, wheel-base and overhang at front and rear.

Ramp cover width

In addition to the drawings of the fixed ramp we need to know the clear width



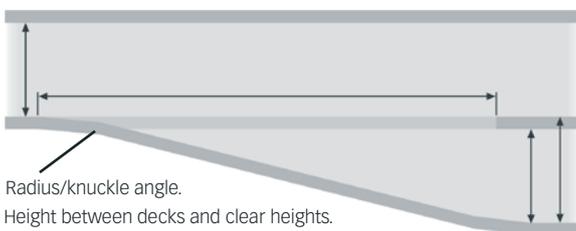
of the lane. Typical clear width values: 3,5 m for single and 7,0–9,0 m for dual lane trailer traffic and 2,8 m for single-car-lane.

Loadings

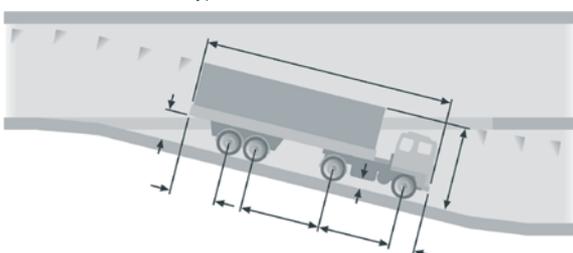
In order to dimension the steel structure with the required strength and minimum weight we need to know the following: what kind of vehicles will be driven

over the ramp cover? What are the axle loadings and wheel print area? How many axles are there and how far apart are they? What is the maximum deck load to be supported on the ramp cover when it is in the closed position?

How much water pressure must the ramp cover withstand from below?



Type of vehicles and clearances



Side-hinged ramp cover in two sections



Side-hinged ramp cover with foldable handrails

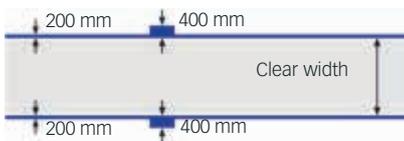


End-hinged ramp cover

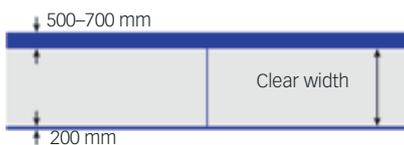
Interface between ramp cover and ship

When you design the hull in the area of the ramp cover, adequate space must be reserved for the ramp cover and its associated equipment.

In most cases the ramp cover requires a longitudinal space equal to eight times the height between the decks. The required lateral space consists of the clear driveway plus approximately 400 mm at each side of an end-hinged ramp cover operated by direct hydraulic cylinders. A side-hinged ramp cover needs a space of 200 mm at the support side and 500-700 mm at the manoeuvring side, depending on size.



End-hinged cover. Reserve space for ancillary ramp cover equipment.



Side-hinged cover. Reserve space for ancillary ramp cover equipment.

Hydraulic capacity

The determining factors in dimensioning the capacity of the hydraulic system are the size of the ramp cover, number

of sections, and the required speed of opening and closing.

A typical time for opening or closing a 20 m side-hinged section is about 0,5 minute, excluding opening and closing of the securing devices.

The corresponding time for a 40 m end-hinged ramp cover is about 3 minutes. The shorter the time, the more costly the required hydraulics.

An indication should be given of the maximum and minimum ambient temperatures in which the hydraulic system is to operate.

Regulatory bodies

Please specify which demands are to met by the equipment. In order words, which classification societies, national authorities and other regulations (e.g. IMO) are to be satisfied.

The MacGregor ramp cover is always classified as part of the deck of the ship.

Options

On the right we show the equipment or accessories which require your decision, also optional equipment which may be added to the ramp cover.

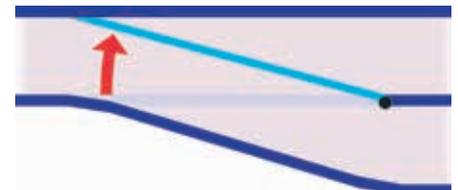
These should be studied point by point when making an initial evaluation, based upon the particular operating conditions.

Ramp cover arrangement options

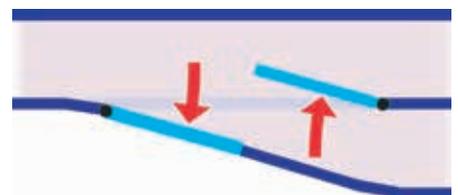
The side-hinged ramp cover is the best choice when the available height between the decks exceeds the width of the ramp cover. It is a simple solution offering faster operation and demanding

lower capacity of the hydraulic system compared with the end-hinged version.

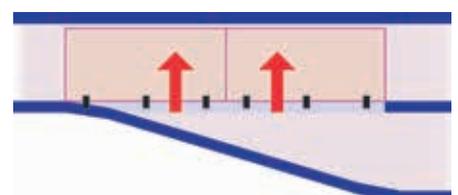
The end-hinged ramp cover is the natural choice when the height is not sufficient, or when there is a lack of space due to longitudinal bulkheads alongside the ramp cover. There are two versions available — in one or two sections.



One section end-hinged ramp cover



Two section end-hinged ramp cover



Side-hinged ramp cover in two sections

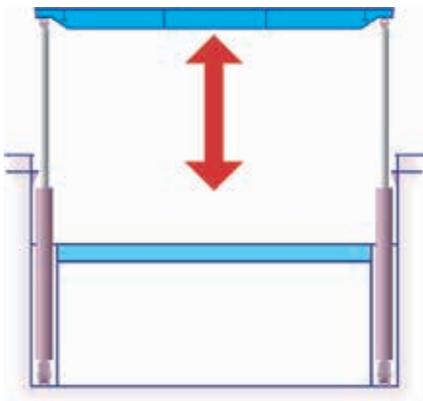
Control options

Two different systems are available — manual, where each step in the operation is controlled by hand-operated hydraulic valves; and automated, whereby pressing and holding a single button will initiate and complete the whole opening or closing sequence.

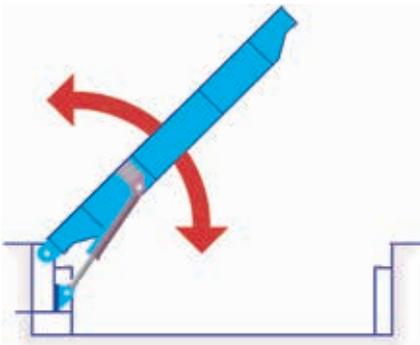
The greater the degree of automation, the easier and faster the operation.

An automated system will be particularly cost effective on shorter runs where there is a need for faster loading and unloading.

- Manual control system
- Automated control system



End-hinged ramp cover operated by direct hydraulic cylinders



Side-hinged ramp cover operated by direct hydraulic cylinders

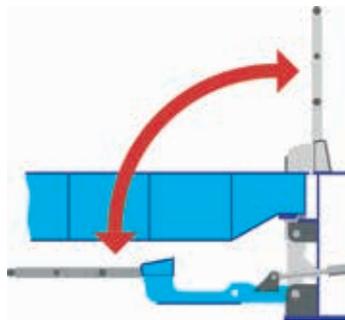
Operating options

In the side-hinged version hydraulic cylinders acting directly on the ramp cover for the operation. Provided that there is sufficient space, this is the most cost effective and reliable solution also for the end-hinged version. (Otherwise, the ramp cover may be operated by wire ropes, anchored in the ramp cover, by a hydraulic jigger-winch mounted at the deck head or in a recess in the

longitudinal bulkhead). To accommodate transverse forces during operation, the ramp cover is guided by guides attached to the bulkhead, or guide bars attached to the ramp cover. The latter solution is used on open decks without bulkheads.

Handrail options

The handrails are always fitted in the hull. Normally the shipbuilder provides fixed or portable stanchions. If you prefer to avoid the manual work, in order to handle the stanchions, or any disturbance during loading and unloading, we can offer you automatically foldable handrails.



Automatically foldable handrails

Sealing options

There are three alternatives — no sealing, watertight sealing or gastight sealing. On request, the sealings can also be combined with fire protection. The seal will then be of fire-retardent material.

The MacGregor standard for ramp covers

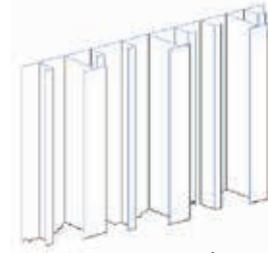
Over the years MacGregor has designed and manufactured a great variety of ramp covers for different types of ships.

We therefore promise that your ramp cover will meet your needs in terms of quality, efficiency, security and overall economy. Yet it will be standardised in all major functions.

In other words, you will be supplied with well-proven equipment which is easy to repair in the event of an accident and easy to maintain for long-term trouble-free operation. We believe in high quality in every respect.

Steel structure quality

The ramp cover is designed as a flat top plate with an open web construction or partly boxed. High tensile steel is used throughout the ramp cover standard.



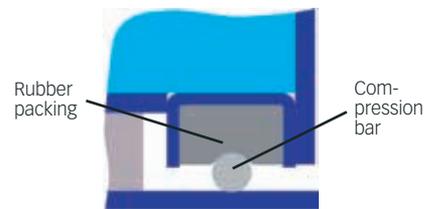
Open web construction

Quality of fittings

Shafts and pins exposed to the weather are of stainless steel. Cylinders are fitted with spherical plain bearings.

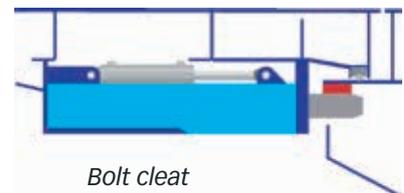
Sealing and securing quality

The MacGregor team has developed an efficient and watertight seal.



A rubber packing is placed in and around the perimeter of the opening of the hull. When closing the ramp cover the rubber is pressed against compression bars made of stainless steel.

These have a very smooth surface to guard against any penetration of water. The ramp cover is secured in the closed watertight position by hydraulically operated bolt cleats at each side of the ramp cover. They are well-proven MacGregor innovations which can be relied upon.



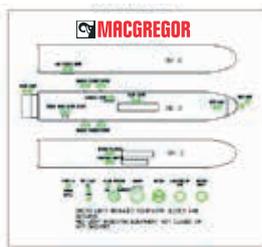
Bolt cleat



Safety quality

Being the market leader, MacGregor's ship experts are invited by national authorities and classification societies to use its expertise and experience, gained from numerous installations, to help develop and evaluate new rules and regulations.

Your ramp cover will incorporate a number of items of safety equipment regulated by classification societies and authorities. When the ramp cover is closed and cleared, the true status is confirmed by the indicator lamps both at the operating panel and the bridge panel.



Bridge panel

Custom designed load control valves are normally fitted directly on the cylinders. This will prevent the ramp cover from falling down in the event of hydraulic or electrical failure. Only high quality components of marine design from approved suppliers are used in MacGregor equipment.



Side-hinged ramp cover



Lloyd's Register Quality Assurance certifies that the Quality Management System for MacGregor is ISO 9001:2008 compliant.

MacGregor is the world's leading brand of engineering solutions and services for handling marine cargoes and offshore loads. MacGregor products serve the maritime transportation, offshore and naval logistics markets, in ports and terminals as well as on board ships. Our cargo flow solutions integrate cargo access, stowage, care and handling functions to suit a particular ship's cargo profile. This benefits its productivity, environmental impact and profitable service lifetime.

MacGregor is part of Cargotec. Cargotec's class B shares are quoted on NASDAQ OMX Helsinki.

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