



# Full Mobility At Sea

THE BURGER BOAT COMPANY'S SIS W

The Burger Boat Company has recently completed delivery of its latest motor yacht *Sis W* to its owners, Mr & Mrs Charles Walgreen Jr. At 38.4 metres (126 feet), this tri-deck yacht has become the largest yacht in Burger's 140-year history of boat building.

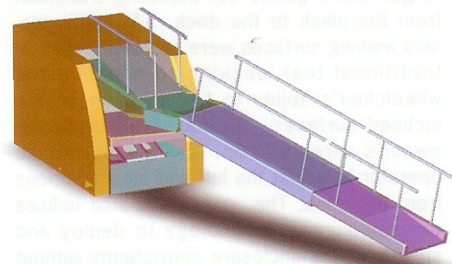
The Walgreens are both in their nineties and are both physically disabled. The ultimate challenge for the shipyard was therefore to design and build a yacht with full wheelchair access, enhancing the clients' mobility while on board and providing accessibility to all decks. Further, the shipyard was tasked with the challenge to provide convenient boarding at all embarkation points. Nautical Structures, which has been Burger's primary supplier of tender-handling equipment and hydraulic passerelles for over a decade, was contracted by Burger Boat Company to collaborate on this project.

The creation of *Sis W* has been a collaboration between Casey Pratt, Mr Walgreen's grandson; Captain Jim Bean, who has been with the family on the last three yachts;

Joanne Walgreen, granddaughter and owner of Belden Interiors; and the engineers and craftspeople at Burger Boat Company.

## Custom Passerelle

The first element of the project would be the hydraulic pocketing passerelle, suitable for boarding with a motorised wheelchair. To accommodate the motorised wheelchair comfortably the passerelle was designed with a minimum





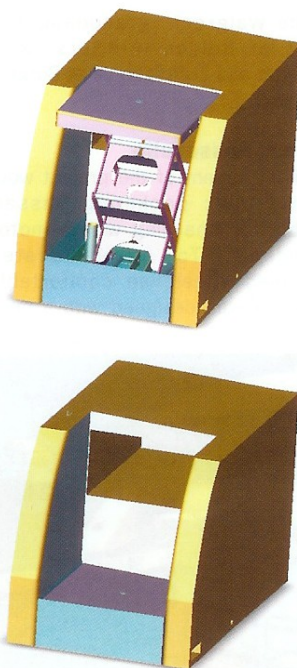
walking-surface width of 28.5 inches (72 cm) and a clear width between the stainless steel rail stanchions of 30.0 inches (76 cm). The configuration of the passerelle would provide boarding to the stern of the vessel as well as to the starboard side of the yacht. To achieve this the passerelle was designed to slew a total of 90 degrees, 20 degrees to port and 70 degrees to starboard. To facilitate boarding in the most diverse circumstances it was decided that this passerelle must be self-supporting, that is capable of being used without support from wheels on the dock. The structure of the passerelle supports 600 pounds (272 kg) applied to the end of the plank with a very minimal amount of plank-end deflection. The car section of the passerelle was extended to create a larger transition area prior to reaching the slewing section. Integrated into this transition area a hydraulically actuated ramp section 70 inches (1.6 m) long was fitted. The ramp automatically elevates asymmetrically so that the forward leading edge of the ramp tilts to interface with the camber of the main deck. This design eliminated an uncomfortable step from the inboard side of the ramp to the deck had the ramp elevated level side-to-side.

The passerelle includes a second hydraulic telescoping section that extends the plank to its total deployed length of 23.6 feet (7.19 metres). Additionally, a manually deployed ramp folds out of the end of the passerelle providing an additional 36 inches (91 cm) of length and a gentle self-adjusting transition from the plank to the dock. 3-M black non-skid walking surfaces were selected in lieu of traditional teak decking to enhance the wheelchair's ability to find traction on the inclined surfaces. The passerelle includes owner's wireless controls that permit an operator to adjust the luff and slew positions from the dock. The passerelle also utilises our self-aligning technology to deploy and stow from the enclosure consistently without the use of unreliable electrical proximity switches or sensors. Dual hydraulic cylinders on both the luffing and slewing functions position the passerelle for transport with repeatable precision. A hydraulic sequence ensures that the passerelle is aligned within the enclosure prior to deployment. The passerelle drives itself in and out of the enclosure with a self-propelling drive system that is independent of the enclosure. This is a safety system that permits the passerelle to move within the enclosure without structural damage in the event of plank-end contact. Ultimately the passerelle is built to be safe and very reliable.



#### Scissor-Lift

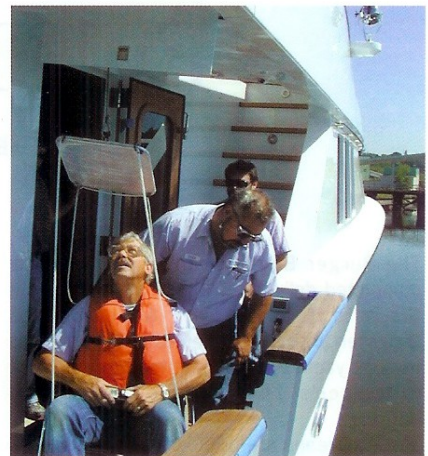
The shipyard wanted to provide wheelchair access to the lazarette deck from the yacht's main deck, and an integrated hydraulic scissor-lift was designed for this purpose. The scissor-lift integrated into a pocket built into the swim platform directly under the passerelle's boarding gate.



Access to the scissor-lift is available only when the passerelle is stowed. The hydraulic scissor-lift transports a 46-inch x 48-inch (116-cm x 122-cm) aluminium platform vertically a distance of 60 inches (1.52 metres) from the swim platform to the main deck. Deck camber was matched in the moving-platform so as to provide a uniform transition from the deck onto the platform. The design was developed using SolidWorks 3-d modelling software. The lift is a simple and convenient means to transport the client between the two decks and provide easy wheelchair access to the yacht's lazarette and swim platform.

#### Overhead Beam Cranes

The client wanted wheelchair access to the dock from the yacht's main deck, a trio of integrated hydraulic overhead beam cranes were designed and delivered for this purpose. The beam cranes are capable of safely hoisting an adult in a motorised wheelchair, and transporting him or her 8.8







feet (2.7 metres) off of the side of the yacht to the dock.

The beam cranes are configured with a non-fouling Hydraulic Linear Winch system, a silent operating hoist that self-limits the cable travel. Each crane is housed in an enclosure integrated into the yacht's overhead, essentially invisible to the eye when stowed. Cranes are positioned over the starboard-amidships boarding gate, starboard-aft boarding gate and port-aft boarding gate. Each crane is powered by an independent hydraulic power unit for dependability, and each crane is operated with a dedicated hand controller. The cranes provide simple wheelchair access to the yacht's principal boarding gates where typically access with wheelchairs is not possible.

#### Knuckle-Boom Deck Crane

A yacht-quality knuckle-boom crane was selected to provide the highest level of flexibility in handling tenders and servicing the lazarette deck. The knuckle-boom crane provides an additional fourth axis of motion, not found in a conventional deck crane. This allows exceptional reach-range and the ability to lower the tip of the crane's boom towards the waterline, reducing the amount of cable payout required to reach the water. The benefit of this feature becomes apparent in a rolling sea, when the pendulum effect of the cable causes the load to become more and more difficult to control. The shorter the length of exposed cable, the less the pendulum effect. The EZ-4000-KB knuckle-boom crane is fit with a silent operating Hydraulic Linear Winch

system, housed in the second knuckled boom section. The self-limiting feature of the Linear Winch prevents the potential of two-blocking the cable during hoisting operations. The non-fouling feature of the Linear Winch system permits the crane operator to pay out extra cable into the tender during retrieval, allowing sufficient slack in the cable to attach to the lifting bridle without worry of snatching the cable in a rough sea. The crane is configured with a wireless proportional remote control – allowing the crane to be operated from anywhere on the yacht, or from the dock, up to 100 yards away. Back-up controls are provided on the hydraulic valve manifold, conveniently located in the crane under a hinged access door. In the event that the wireless controls are not available or inoperable, the crane may be operated manually with the proportional hand-controls in the crane. While the knuckle-boom crane's primary purpose is tender-handling, the crane's ability to service the lazarette deck provides the potential benefit of hoisting a wheelchair up to the boat deck, as well as assist in emergency wheel-changes while at sea.

Sis W is the fourth collaboration between the Walgreens and Burger and many at the yard were inspired by Mr Walgreen's decision to build a new boat at the age of 97. The owners plan to cruise extensively for the rest of their lives.

**Rick Thomas**  
**Nautical Structures**

