



# Buildings or Boats No Challenge for Concrete Cutters

**Ballast Removal Allows  
Smooth Sailing  
for Vehicle Transport Ferry**

The MV Katama ferries cars and trucks between the beautiful island of Martha's Vineyard and the Massachusetts mainland. Originally built as a freighter ship stationed off the coast of Martha's Vineyard, the Katama was converted to a vehicle transport ferry years ago and more recently underwent some additional major changes. Earlier this year, the Katama spent several months docked at a Jacksonville, Florida shipyard so that she could be widened by 12 feet. The expansion was done to increase her payload, allowing her to transport an additional 12 cars or three large trucks. As a result of the expansion, 70 tons of steel were added to her frame.

The same procedure had recently been done to the Katama's sister ship, already back in operation at Martha's Vineyard. After construction had begun on the Katama, the ship's crew received reports that the renovated sister ship was experiencing major operating problems. The added weight was causing the ship to run aground and was preventing her from being able to operate at her newly designated payload. It was already too late to stop the expansion of the Katama because the work was 80 percent complete, but the ship's owners knew they could come up with a solution to alleviate the problem.

It was determined that the 9-foot-thick concrete ballast located in the ship's hull and situated below the top deck at mid-ship could be removed to reduce the weight. Marine engineers calculated that if two areas measuring 12 feet by 13 feet by 3 feet deep were removed from the 9-foot-thick ballast, the 70 tons of concrete removed would compensate for the additional steel.

In April 2005, the North Florida Shipyard, the general contractor of the project, contacted CSDA member ConCut Southeast, Inc. of Jacksonville, Florida to determine if and how the concrete could be removed from the ship. It was concluded that the desired results could likely be achieved using a combi-

nation of core drilling and controlled breaking with an expansion agent. Drop-in anchors and eye bolts would be used to remove the cut pieces.

Concrete core drilling with diamond tools was specified for removal for a few reasons. With both ballasts being 9 feet thick and encased with bulkheads, there was limited access for the operators as well as the equipment. There could be no damage to the bulkheads, which butted right up to the ballast concrete that would be removed. Stitch drilling would be fast and efficient, allowing operators to complete the job in the 12-day window allotted. The Katama had to leave port no later than May 14, and the general contractor needed five days to complete its work after the ballast removal.

After a meeting between ConCut Southeast and the general contractor, it was decided that ConCut would begin concrete cutting operations the next day. Initially, ConCut thought it would have to work in an extremely tight space because access from the top of the ballast being removed to the ship's deck above was only 49 inches. However, this problem was resolved when the general contractor agreed to remove the steel deck above the ballast in the exact dimension of the concrete being removed. So, prior to removal the general contractor cut away the ship's steel top deck with torches, allowing access to the ballast for the operators and their equipment.

ConCut operators began by line drilling 6-inch-diameter by 36-inch-deep holes around the perimeters of the two 12-foot by 13-foot areas in order to create a 6-inch-wide gap between the concrete ballast and the steel bulkheads. This gap allowed room for the concrete to shift during the expansion process, preventing it from causing stress or damage to the ship's bulkheads.

Next, 2-inch-diameter by 36-inch-deep holes were cored using 110-V and hydraulic core drills from Diamond Products and core bits from Dimas. The holes were cored through the





**Top:** Removing a large section of the ship's 9-foot-thick ballast was necessary to reduce its weight.

**Middle:** Using 110-V and hydraulic core drills, operators cored holes in a 12-inch on-center grid pattern.

**Bottom:** Core drilling isolated the ship's bulkheads and allowed operators to drill with limited access.



remaining portion of ballast being removed in a 12-inch on-center grid pattern, allowing for the installation of the expansion agent that would help control the breaking pattern. After setting the expansion agent, ConCut operators left the work area alone for a 24-hour period to allow the agent to completely expand and break up the concrete. Then operators set 3/4-inch drop-in anchors into the broken pieces and rigged them for crane removal. The crane and crane operator were provided by the general contractor. Hydraulic hoe rams were initially considered as a method to break up the concrete ballast, but contractors were concerned that they would not be able to control the breaking pattern, thus risking damage to the bulkheads and the remaining ballast areas. Also, with the unpredictability of this method, ConCut did not want to jeopardize the timetable.

Operators encountered a few challenges on this job. Water and slurry were running below the ship's hull and collecting between the bulkheads 9 feet below the deck. A submersible trash pump was used to evacuate all the slurry from the lower deck, out of the ship and into the contractor's containers. In addition, rain became an issue on the day the expansion agent was to be mixed and set. Contractors solved the problem by stretching a cable across the ship and draping it with a tarp to cover the workspace.

Operators followed standard safety procedures during the job and wore all the appropriate Personal Protective Equipment (PPE). The shipyard also required ConCut to have a safety monitor posted on the top deck above the work area to monitor all concrete cutting operations.

In all, ConCut operators cored 210 holes measuring 6 inches in diameter by 36 inches deep and 288 holes measuring 2 inches in diameter by 36 inches deep. They used 160 bags of DEXPAN expansion agent supplied by Archer Company for the controlled breaking of the concrete ballast. They successfully removed 67 tons of concrete in the 12 days allotted with a 3- to 4-man crew.



Top: Line drilling around the perimeter created room for the concrete to shift during the breaking process.

Bottom: Operators removed almost 70 tons of concrete ballast in 12 days.

The project was completed on time and under budget. On the day of completion, ConCut Southeast General Manager Dan Wyrick received a phone call from the ship's owner in Fairhaven, Massachusetts asking if ConCut Southeast could mobilize to Martha's Vineyard and perform the same task on the Katama's sister ship. ConCut could not travel that distance and referred the job to another CSDA member.

"I was extremely satisfied with the outcome of this project," said Wyrick. "We had not used this method in an application like this before but we were confident it would give the desired results. Our operators did a great job of staying on schedule by properly organizing tasks everyday, assigning duties and practicing good teamwork." Wyrick attributes ConCut's selection on the job to past project performance and a good reputation. They were recommended to the general contractor by a shipyard foreman who had worked with ConCut on a prior project. On this particular project, luck was also involved as the concrete removal work was purely an afterthought — the general contractor had no plans to remove the concrete ballast when the expansion work began.

The newly expanded MV Katama was back in service at Martha's Vineyard in June 2005. With a large portion of the concrete ballast successfully removed, all involved with the project expect smooth sailing for the renovated ship. ●

**COMPANY PROFILE**

Established 1991 and purchased by new ownership in 2005, ConCut Southeast, Inc. operates out of Jacksonville, Florida and serves the Southeastern U.S. The company has six trucks and performs a variety of sawing and drilling work including wall sawing, wire sawing, slab sawing, hand sawing, core drilling and demolition. ConCut has been a member of CSDA since 1984.

**RESOURCES**

**General Contractor:** North Florida Shipyard Jacksonville, FL  
**Sawing & Drilling Contractor:** ConCut Southeast, Inc. Jacksonville, FL  
**Methods Used:** Core Drilling  
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