

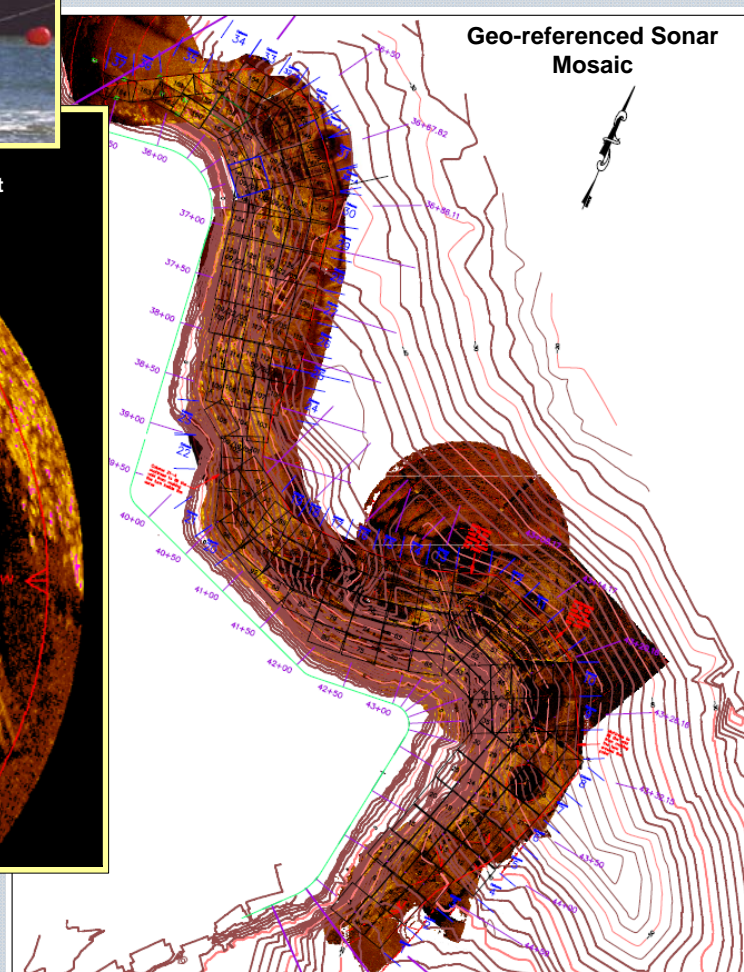
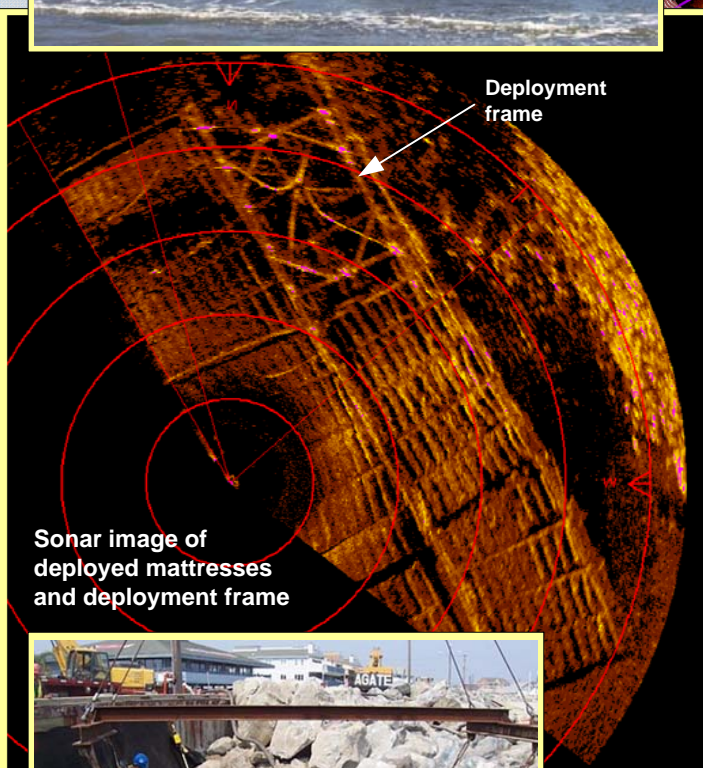


Coastal Revetment Project, Placement of Marine Mattresses

The US Army Corp of Engineers USACE, Philadelphia District, contracted **Agate Construction** to build and reconstruct sections of the Hereford Inlet stone seawall. The MS 1000 High Resolution Scanning Sonar System was used by the crane operator to place and orient the marine mattresses. Once the mats were released the system was then used to determine the geographic position of the mattress corners.



The scanning sonar head was mounted on a spreader bar deployment arrangement so it maintained its position and orientation to the barge; RTKGPS and a gyro were used to position the barge. Display monitors were placed in both the crane cab and the survey shack so that the USACE representative and crane operator could observe sonar image and guarantee the placement of each mattress. The sonar mosaic/drawing below shows the geo-referenced location of all marine mattresses.

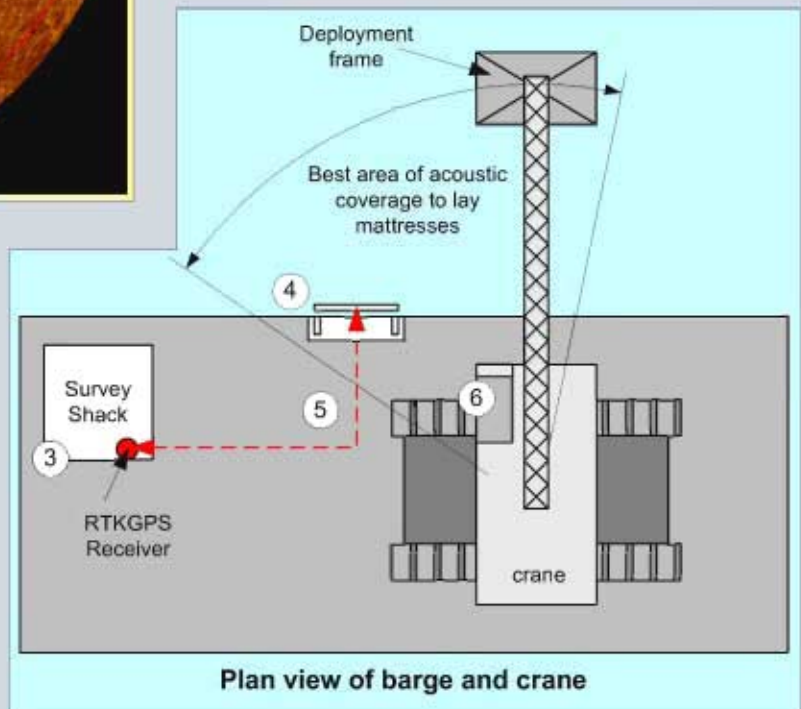
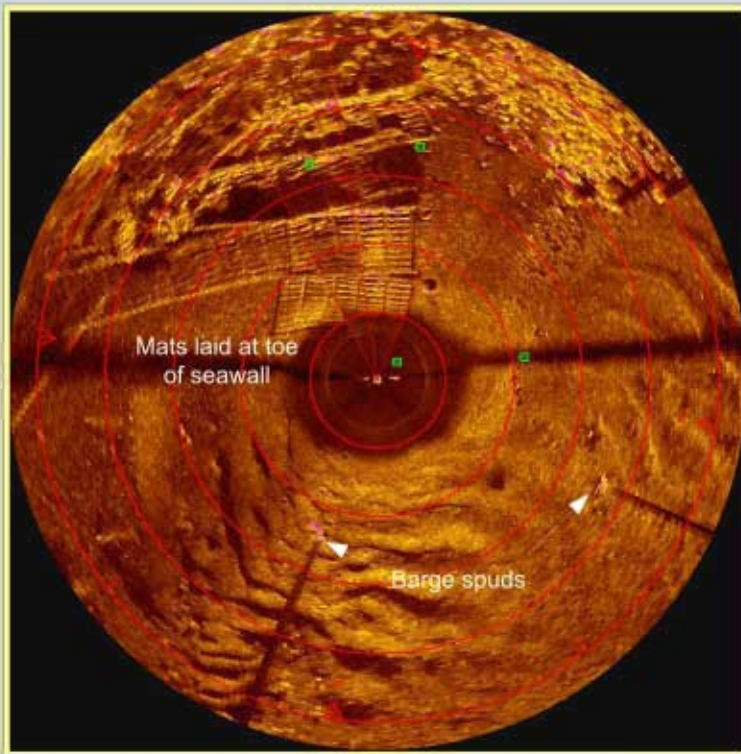
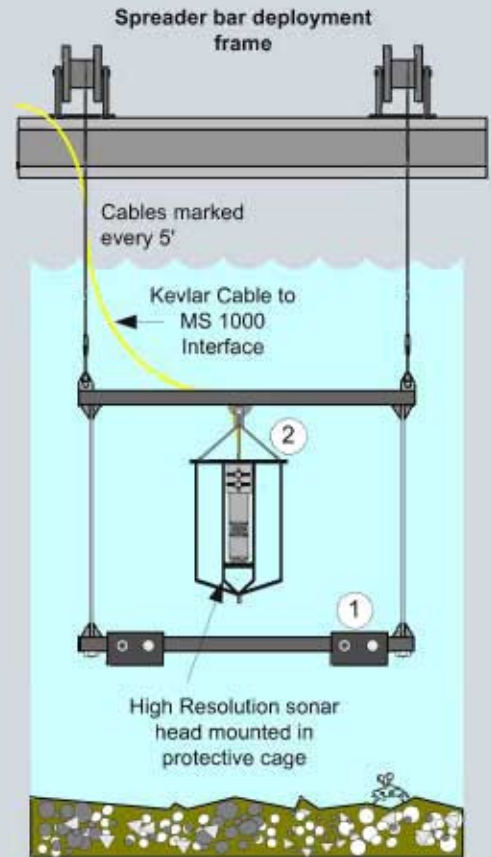


Sonar data, photographs, and geo-referenced sonar mosaic courtesy **Agate Construction CO., Inc.** and **Alpine Ocean Seismic Surveys, Inc.**



MS 1000 equipment configuration for coastal revetment project:

- Computer with MS 1000 PC-based Sonar Software
- MS 1000 Interface Unit
- Kevlar operations cable
- 675 kHz High Resolution Scanning Sonar Head with an transducer (or Multi Frequency High Resolution Sonar Head)
- Spreader bar deployment frame
- RTKGPS
- Survey grade gyro-compass
- Remote display (installed in the crane cab)



Additional information:

- 1 Spreader bar frame is weighted to minimize any offset due to current
- 2 The sonar cage is gimballed only in the fore/aft direction so that it maintains its azimuth orientation to the spreader bar
- 3 Survey shack contains MS 1000 computer, RTKGPS, and gyro
- 4 Spreader bar is deployed from 2 winches so that it maintains barge fore/aft alignment
- 5 X,Y Offset measurement is taken between RTKGPS receiver and sonar head
- 6 Second sonar display is installed in cab so that crane operator can "see" mat location