

Wellwood Reef Restoration Molasses Reef, Key Largo, FL

In 1984, The Wellwood, a 400 ft cargo vessel ran aground in 1984 destroying over 1,000 square meters of coral reef habitat. Most of the damage was centered on the star coral formations. The grounding site was located in the Molasses Reef about five miles off the coast of Key Largo.

Molasses Reef is a popular dive site, but also a Sanctuary Preservation Area. Because of the number of storms and high wave energy conditions at the site, the area of destroyed habitat has dramatically increased over the years. This occurred by the undermining of living coral around the holes in the reef. In 2002, the National Oceanic and Atmospheric Administration (NOAA), called for restoration of the reef back to its original state before the 1984 vessel landing.

Ben C. Gerwick, Inc. was involved in this environmentally sensitive project, drawing upon experience with this type of work on past projects. Ben C. Gerwick, Inc. provided on-site engineering support to ensure a successful completion of the restoration project.

The work required the placement of Reef Restoration Modules. The modules were placed in the empty gaps on the reef floor in order to stop the



Reef restoration module.



Crane barge installing reef restoration modules at operation site.

spreading of further damage. Gerwick developed a special underwater concrete mixture that was used to keep these modules in place. The concrete had to perform superbly with regard to:

- Complete interstitial crevice filling.
- Bonding (including bonds to rebar, rock, reef modules, existing reef material, and cold joint bonds).
- Strength.
- Workability (including the ability to imbed limestone rock into the surface to replicate the natural reef appearance).
- Complete absence of any toxic materials or materials which corrode in salt water.
- Minimal turbidity or loss during construction.

The water at the worksite was 15 to 20 ft deep, and the entire operation was performed off a working barge.

Gerwick engineers provided on-site support, including field demonstration tests, supervision of concrete production, and the quality control and quality assurance of all materials used in the mixing of the concrete.

Services Performed:

- Construction Supervision
- Engineering Support
- Expert Advice
- Underwater Concrete Mix Design
- Field Demonstration Tests
- QA/QC of Concrete Mix

Year of Completion: 2002

Construction Cost: \$15M

Client: National Oceanic and Atmospheric Administration