REMR TECHNICAL NOTE CS-ES-3.2

UNDERWATER CAMERA FOR INSPECTION OF STRUCTURES IN TURBID WATER

PURPOSE: To describe the components and performance of an underwater camera for use in inspection of submerged structures.

APPLICATION: Enables divers to obtain clear photographs under typical conditions encountered in inspecting underwater structural components.

ADVANTAGES:

a. Camera performs underwater.

b. Camera with all other components is maneuverable under typical inspection conditions.

c. Operation of camera is not complicated.

d. Required equipment is inexpensive.

e. Camera is capable of producing photographs in near zero visibility.

f. Photographs obtained cover an area large enough to allow evaluation of a structure.

LIMITATIONS:

a. Care must be taken to avoid the possibility of water leakage and moisture buildup inside the camera housing.

b. Care must be taken to ensure that the incidence of battery failure is minimized.

c. To ensure good contrast, the marine growth should be scraped away from the structure prior to photographing, and the correct film must be selected for the intended task.

PERSONNEL REQUIREMENTS: An experienced diver and necessary support personnel are required.

EQUIPMENT AND AVAILABILITY: Components of the system are as follows:

a. Camera--Minolta SRT 201, 35-mm.

b. Lens--28-mm and No. 1 and 3 close-ups.

c. Housing--Ikelite underwater housing with either dome or flat port.*

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* Available from Ikelite Underwater Systems, 3303 North Illinois St., PO Box 88100, Indianapolis, IN 46208; phone 317-923-4523.

d. Light source--Ikelite Substrobe M (available from same source as c).

e. Power source--rechargeable AA nickel-cadmium batteries.

f. Water box--CressiSub Batiscopia (modified with capped filling spout, light port, plastic lenses, and small-diameter end cut to accommodate housing port).** Small diameter, 6 in.; large diameter, 9-1/2 in.; approximate length, 9-1/4 in.

The camera and batteries are available on the open market.

COSTS: The entire system costs approximately $600.00.

REFERENCES: a. Underwater photography for bridge inspection. D. McGeehan. Virginia Highway and Transporation Council, Charlottesville, VA, Jul 1983. VHTRC 84-RC.

FIELD PERFORMANCE: Sites judged to be typical in terms of water current, visibility, and temperature were sought for tests, and the aid of a number of experienced divers was solicited in selecting them.

Photographs taken under typical conditions gave good detail. A photograph was successfully taken of a concrete plate with a 2-in. cross inscribed on the target. However, several photographs taken in this series were completely unusable due to mud settling on the lens. Care must be taken to allow time for any mud that might be stirred up to settle before photographing.

During these tests, an inspection sampling pattern was developed that would provide a correlation between the photographs taken and the areas of the structures they represented. Using this procedure, a diver can make successive trips to a site to perform follow-up inspections or maintenance operations. The procedure for outlining a sampling pattern and making an initial evaluation of a structure using black and white film and a final evaluation and documentation using color film is discussed in Ref a.

** Available from Cress-Sub, 677 SW First St., Miami, FL 33130; phone 305-545-9000.