

SAMPLERS FOR SUSPENDED SEDIMENT

Sediment is transported by running water. The lighter particles are transported by the water in a suspended state. For the sampling of this suspended sediment for calculation of the overall quantity of sediment carried by the water, various samplers are available.

12.02 Water sampler 'Watertrap'

The sampler 'Watertrap' has been designed to take representative samples from running water up to a depth of approx. 25 meter.

Samples are taken with the stainless steel device by catching part of a horizontal moving column at a certain moment at a certain depth.

The sampler is lowered by means of a hand winch fitted with a steel cable.

The winch is fixed to a telescopic arm. The fastening clip of the telescopic arm allows fixing of the arm on the railing of a bridge or a boat. The depth at which the sampler is located can be read from a depth counter.

The valves are opened before the sampler is lowered. The valves are kept in an open position by the falling clamps.

As soon as the sampler is at the right depth the falling weight is allowed to slide down along the cable, thus thrusting the long falling clamp downwards, resulting in the closing of the downstream valve, only a moment later followed by the other clamp and the upstream valve.

Rubber rings take care of the watertight sealing of the body with the sample, during retrieval. The sample can be discharged by opening the valves.

By relocating the weights and adjusting the fins, it is possible to hang the sampler in any required position relative to the direction of flow.

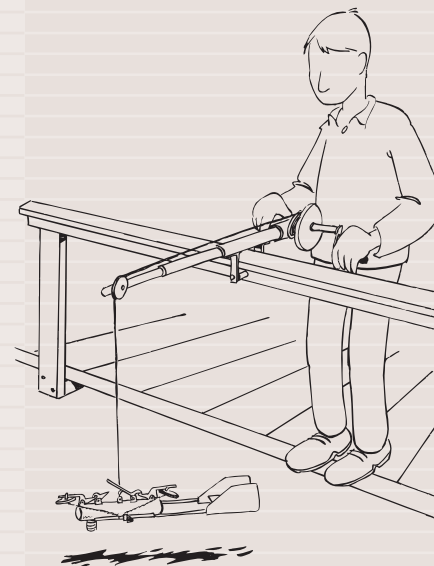
The standard set comprises, among other items: the stainless steel water sampler, a falling weight, a hand winch and a telescopic arm with fastening clip and depth counter.

The whole is packaged in a transport case.

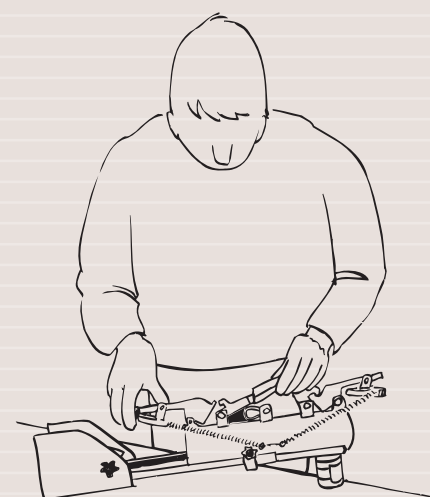


P1.42
Parts List
Pg 324

The winch of the Watertrap is fixed to the railing of a bridge.



The sealing valves of the watertrap are opened before the sampler is lowered (spring operated).



Water sampler 'Watertrap', complete set



P1.42
Parts List
Pg 324

The water sampler is emptied.



The hand sampler is lowered on a rope at a steady, not too high, pace.



SAMPLERS FOR SUSPENDED SEDIMENT



For correct sampling it is important that the water sampler is suspended in balance in the water. Bringing the sampler in balance can be achieved by:

- Adjusting the horizontal tail fin on the tail.
- Sliding the tail fin rods through the guiding tubes.
- Altering the weight under the front of the stainless steel cylinder.

Applications

The taking of representative samples (1250 cc) from any desired depth in flowing water can be effected for the benefit of:

- Chemical analysis.
- Biological- and bacteriological analysis.
- Thermal analysis (cooling water disposal).
- Mineralogical analysis.

For instance to determine the measure of mud- and/or soil transport by water).

04.35 Sampler for suspended sediment

The hand-held depth integrating sampler is a small, light-weight hand-operated device used to collect sediment laden waters from low-level rivers or other water courses.

The metal housing of the sampler contains a glass bottle in which the water is collected.

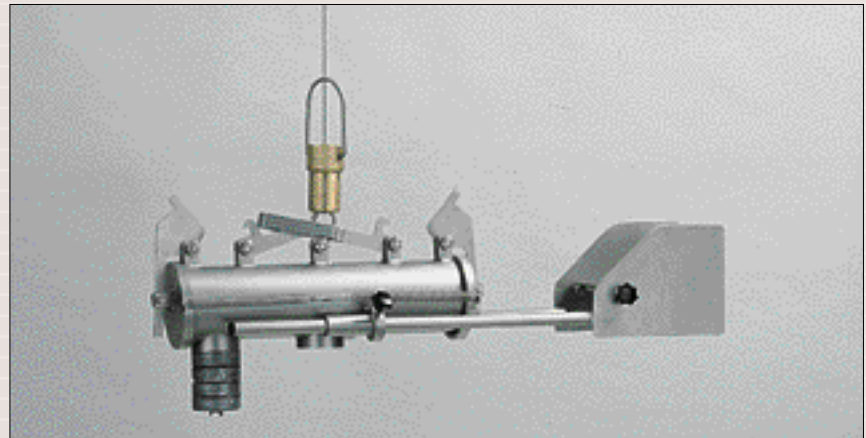
A calibrated intake-nozzle, allows the incoming water to flow into the bottle.

An integral air-vent allows air to escape from the bottle as it slowly fills with water during lowering and retrieving.

The tail fin keeps the sampler in up-stream direction.

Care should be taken during the timing cycle to prevent over-filling of the bottle.

After every completed sampling the bottle should be replaced.



Water sampler 'Watertrap' with closed valves



Sampler for suspended sediment

SAMPLERS FOR SUSPENDED SEDIMENT

04.31 Suspended load sampler, Delft bottle type

This sampler is used to measure suspended sediment transport in rivers and other water courses, from the surface down to 0.1 m above the river bottom.

The sediment containing water flows through a bottle shaped sampler. The shape of this sampling body induces a low pressure at the rear face in such a way, that the water enters the nozzle of the sampler with almost the same velocity as the undisturbed flow.

The sharp decrease of the velocity in the wide sampling chambers causes the sediment material to settle there.

The sampler can be used in two ways:

- Suspended on a cable for all depths from the surface to 0.5 m above the bottom. A tail fin keeps the nozzle in up-stream direction.

- Standing in a frame on the bottom for distances of 10, 20, 30, 40 and 50 cm from the bottom.

The set comprises a sampler, the frame, a number of nozzles and measuring glasses.

Because of the flow-through principle a large volume of water is sampled.

Advantages

- Easy to use.
- Sturdy construction.
- Can be used at any depth.

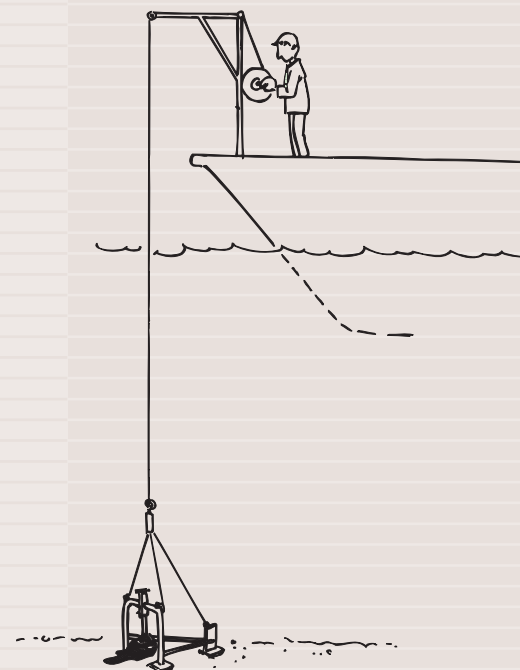
Limitations:

Handling requires a davit with depth counter and winch, due to the weight of the instrument. Simultaneous measurement of velocities is necessary.



P1.42
Parts List
Pg 324

The sampler is placed on the bottom of the river using a hand winch.



The current velocity of the water determines the shape and the size of the nozzle. This can be adjusted quickly and easily (exchanging the nozzles).



Suspended load sampler Delft bottle type



P1.42
Parts List
Pg 325



SAMPLERS FOR SUSPENDED SEDIMENT

04.32 Bed-load transport meter Arnhem type

This sampler is used to measure bed-load of coarse sand and fine gravel in rivers and other water-courses.

The streamlined sampler is mounted in a frame and consists of a mouth followed by a basket of fine wire meshing (width of the mesh 300 mm).

The sharp decrease of the velocity in the wide sampling chambers causes the sediment material to settle there.

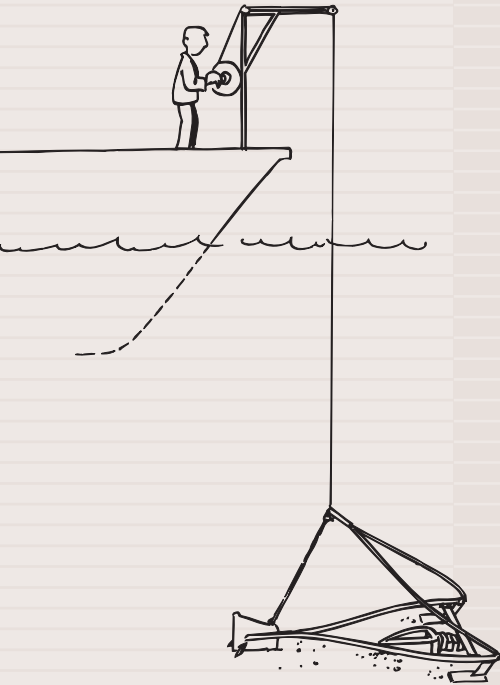
A tail fin mounted on the frame keeps the sampler in up-stream direction.

The results of the measurements are influenced by the shape of the bed (ridges, dunes, flat beds, etc.).

For a successful measurement knowledge of the relief of the bed is essential. The sampler can be discharged on board using the sampler trough.

The set comprises: the sampler, the frame, measuring glasses, sample trough and spare parts.

The empty sampler is placed on the river bottom using a hand winch.



Bed-load transport meter, Arnhem type