

APPENDIX A

MAZIER SAMPLING

Purpose and Scope

The purpose of using Mazier sampler in borehole sampling is to obtain high quality undisturbed samples. The scope of Mazier sampling is in cohesive soil with medium stiffness or greater and in sandy soil with moderate density or greater.

Apparatus

The apparatus consists of a rotary triple tube sampler with an outer and an inner barrels, a PVC tube and a sampler head, a cutting shoe and a drill bit.

The rotary triple tube sampler (according to Japanese Geotechnical Society) is shown in Figure A-1. As shown in the figure, the sampler head is made of several parts. The drilling rod is connected to the upper part of the sampler head and the outer tube and inner tube are separately connected to the lower part. The swivel system ensures that the rotation of the drilling rod is transmitted only to the outer tube, while the inner tube remains stationary. When driving the sampler, the protruding length of the shoe is adjusted by the spring depending on the degree of stiffness or density of the soil, as shown in Figure A-2.

The outer tube is generally made of seamless steel pipe and shall have a

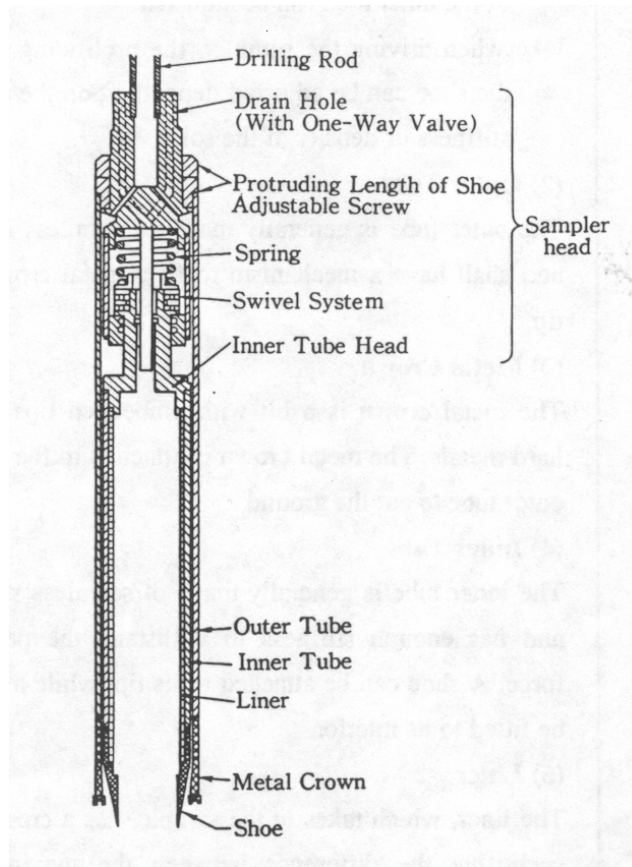


Figure A-1 Rotary Triple Tube Sampler (after Japanese Geotechnical society, 1998)

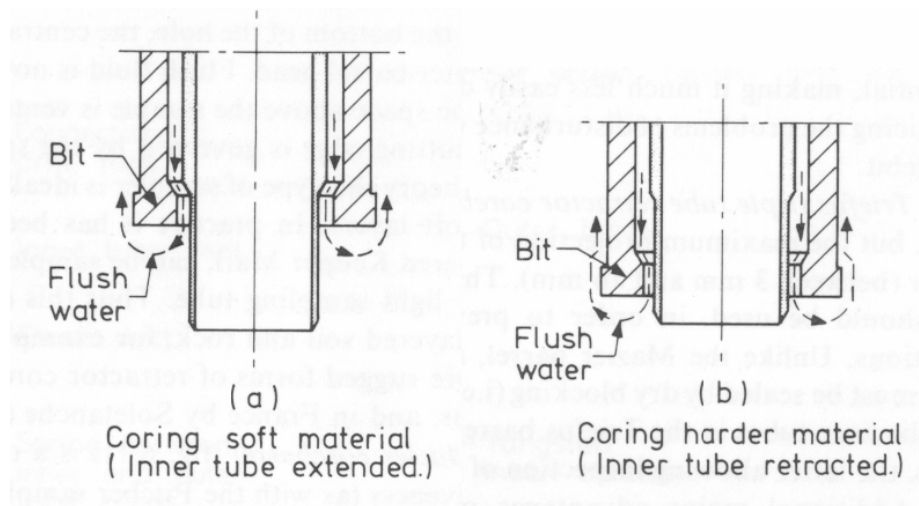


Figure A-2 Adjustment of Protruding Shoe Length (after Clayton *et al.*, 1995)

mechanism to fit a metal crown at the tip. The metal crown is a bit with embedded tips of super hard metals to cut the ground. The inner tube is generally made of seamless steel pipe, and has enough stiffness to withstand the penetration force. The liner in this case is PVC pipes.

Procedure

The procedure of Mazier sampling used by Kiso-Jiban are as follows:

- 1) Lower a triple tube sampler using drill rods into the clean-flushed borehole to the required sampling depth.
- 2) Pump the flush fluid through the drill rods at controlled speed and volume. Most common flush fluid is water or bentonite slurry (drilling mud). The flush fluid is used to cool the mechanical parts and at the same time to bring up the “cuttings” of ground.
- 3) Rotate the drill rods by chuck of the drilling rig. At the same time, apply downward thrust using the rig’s hydraulic system at a controlled speed and pressure. The drill bit fixed to the bottom of the triple tube sampler cuts the soil, which is returned within the PVC tube in the inner tube.
- 4) After the required penetration length is meet, pull out the triple tube sample from the borehole.
- 5) Push out the PVC tube containing the sample.

After the PVC tube is pushed out, the samples are sealed immediately with wax, labeled and delivered to the soil laboratory.