We investigate the crust, the upper mantle and the mantle transition Zone (TZ) under the Cape Verde archipelago with P and S receiver functions from a few tens of seismograph stations. The crust is similar to that previously found with the same techniques under the Azores hotspot: the strong discontinuity at a depth of 10 km is underlain by a 15-km thick layer with a high Vp and a high Vp/Vs velocity ratio. On the other hand, the upper mantle differs from that observed beneath the Azores region by a relative shallow Gutenberg discontinuity (70 km versus 80 km), lower S velocity in the mantle lid and a relatively high Vp/Vs velocity ratio. The thickness of the TZ under the archipelago is reduced by 30 km relative to the standard (IASP91). The reduction is unusually large because it presents a combined effect of a subsidence of the 410 km discontinuity and an uplift of the 660-km discontinuity. The data reveal a reduction of the S velocity of a few percent between the 450-km and 500-km depths relative to IASP91 standard model. This low velocity zone is very similar to that previously found under the Azores and a few other hotspots.