The construction age of a pavement in a “Rodedian” prehistoric cult site in Negev desert, Israel, is established by determining the burial age of (i) a cobble used in the pavement, and (ii) the underlying sediment. The quartz OSL age and the K-feldspar corrected IR50 age from the sediment and the corrected IR50 and pIRIR225 ages from the cobble surface are all consistent, and give an average age of 4.22 ± 0.06 ka. Although the very similar ages indicate the reliability of the methods, these ages are ~3e4 ka younger than that expected for the Rodedian sites. The IR50 and pIRIR225 luminescence-depth profiles from the cobble indicate multiple exposure and burial events in the depositional history. The apparently young ages may thus represent a later intervention in the site during the late 3rd millennium B.C. More sites need to be dated by the use of both rocks and sediments to confirm this suggestion. Important information on the bleaching history of the rock surfaces directly obtained from these luminescence-depth profiles is not available in the underlying unconsolidated sediments. This is a significant advantage of rock surface dating over more conventional sediment dating. © 2015 Elsevier B.V. All rights reserved.