

Abstract The wedge-shaped St. Paul block, western side of the Gulf of Suez rift, exposes Late Cretaceous beds that are folded into transverse folds. The block is bounded from the east and west by east- and southeast-dipping rift-related normal faults, respectively. This study reveals that the transverse folds are extension-related, and formed due to the buttress-like effect that was created during the movement along the rift-related normal faults. The more competent Eocene hanging-wall block of the N-S-striking fault buttressed against the moving less competent Cretaceous hanging-wall block of the NE-SW-striking fault. A localized zone of shortening developed between the two fault trends causing the intervening wedge-shaped block to be crumpled and folded into a series of kilometer-scale, gentle SSE-plunging folds. The buttressing, within block internal localized strain caused by the zigzag geometry of the NE-SW-striking fault, and the effect of the minor cross fault explain the SSE-to-ESE plunges of the mesoscopic folds. This study turns the attention to the buttress-like effect as one of the mechanisms of extension-related folds during rifting.