Supplementary Figure 1. Interpretation diagram and scan of sample Ásgil 9. This thin section was sampled from the lowermost thrust block at a structurally deeper part of the moraine. The location of the thin sections can be seen in Fig. 4.

Supplementary Figure 2. Interpretation diagrams and scans of samples Mel 12 (a), Mel 13 (b) and Mel 15 (c). The samples were collected from bedded/laminated glaciomarine sand and silt/clay located below the thrust-block detachment. The sampling locations are marked on Figure 10. These thin sections reveal that the sand underwent fluidisation causing brecciation of the clay-rich laminae. The sand is folded and the vergence of folds record apparent sense of shearing towards the southeast.