The use of procedural modeling for building generation has risen dramatically over the last years, being an elegant and fast way to generate huge, complex and realistically looking urban sites. However, due to its generative nature there are still unsolved problems that limits their usage. In this paper we report on the challenges still pending on procedural modeling of buildings. We provide a state of the art on most recent solution and we draw possible research avenue that could be taken for spreading the use of procedural modeling in current applications.