uplift and motion after intense wave impacts. The importance of the lighthouse network to the safety of navigation, in combination with the heritage value of these iconic lighthouses, provided the motivation for this structural analysis.

The uplift and rocking behaviour of slender structures was first introduced by Housner [1]. His work evidenced that the structural behaviour of bodies capable of uplift

Figure 1. Fastnet lighthouse: (a) aerial photograph (b) original section drawing and (c) details of dovetailing and keying for a course of stones

3 Limit analysis

The limit analysis method calculates the magnitude of lateral force that is necessary for triggering a failure mechanism such as

failure mechanism are presented in Figure 3. This graph illustrates the importance of the impact height on the structural stability. The combination of bigger diameter and greater weight near the bottom makes the lighthouse able to resist significantly bigger forces if the impact is near the bottom. Moreover, the huge importance of the vertical keying to the stability of the lighthouse is revealed. Excluding the non-realistic 180° and 60° mechanisms, the dotted line shows that without vertical keying, the lighthouse would fail in sliding rather than $h = 2.3\,(e(ht) - 4.6$

the wave time-history for a specific rock mounted lighthouse are provided from a pilot study on the Eddystone lighthouse [8]. The reader can refer to it for more details about the analytical formulations which include a knowledge of the site bathymetry.

Model #3,with discontinuous material properties and interface contacts that allow detachment, had the best