

SAPPER: ONLINE PLATFORM FOR PREDICTION

THE BLAST LOADING ON STRUCTURES

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Abstract: The presentation shows a methodology to provide rapid predictions of blast loading on structures. The rapid prediction method described has been coded by the authors into the open source Python programming language and introduced into the online platform called SapperOnline. The presented approach is based on experimental data and empirical formulas collected in official standard Unified Facility Criteria. The correctness of the results is proved for the explosion of spherical, condensed charges, both in free air space and as surface explosions. By then taking a standard engineering approach any engineer could predict the primary features of explosive loading and take it into account during their design process. Moreover, the main part of this work includes also the comparison of the outcomes with the numerical verification. The results are presented for TNT spherical charges. The numerical consideration is performed using ABAQUS Explicit code. The results allow for the assessment of the basic properties of an explosion for an equivalent mass of TNT for any kind of condensed, spherical charges.

Keywords: explosion, blast loading, online prediction.