

REINFORCED CONCRETE STRUCTURAL DAMAGE DUE TO MUNITION INTERNAL EXPLOSION

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Key words : Internal Explosion, Munition, Blast, Fragment, Reinforced Concrete structure

Terror and war threats include the possible hit of structures by various munitions e.g.: rockets, missiles, and artillery shells. Munitions with hard nose and delay fuse can penetrate structure's external layer and explode within it while causing the ultimate damage and risk. As the structure space is more confined the effects of blast and gas pressure are enhanced. A simplified numerical procedure for munition explosion within Reinforced Concrete structures is presented. The blast loading is based on UFC-3-340-02 procedure. Cylindrical munitions fragment loading and effects on the structure is considered simultaneously with the blast loading. The resistance of each structural element is decreased if reinforcement bars are torn by fragments or its cross section was damaged. Each of the relevant structure elements flexure and shear response is assessed and breached zones are estimated. Then the whole structural stability and residual resistance can be determined. The hazards of structural collapse, fragmentation, and debris define risk levels in the structure. The procedure can be used for the analysis and design of reinforced concrete structure which contain protected spaces against penetration munitions.