

# **A FUNDAMENTAL INVESTIGATION OF FAILURE MECHANISM OF REINFORCED CONCRETE BEAMS SUBJECTED TO CLOSE-IN EXPLOSION**

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## **ABSTRACT**

This study presents an experimental investigation of failure mechanism of reinforced concrete beams (120mm x 180mm x 1100mm) simply supported at both ends, subjected to a close-in explosion. Composition C4 with a mass of 376g was used to apply an explosive load to the reinforced concrete (RC) beams. In a series of tests, a distance between the explosive and the RC beam was varied in the range of scaled distance of between  $0\text{m/kg}^{1/3}$  and  $0.3\text{m/kg}^{1/3}$ . Measurement items were pressure-time history, pressure distribution along the beam axis, reaction force and strain of stirrups in the RC beam. As a result of the tests, peak pressures decreased sharply and loading duration increased from the center of the beam toward the end of the beam. Residual displacement and intensity of the local failure region increased as a distance between the explosive and the RC beam was shorten. Failure process, in which the reinforced concrete beam exhibited both global deformation and local failure, was examined based on the strain response and the reaction force at the supports of the beam.