**Investigation of Anchorage Zone in Post-Tensioned Concrete Beam**

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**Abstract**

The national codes and manuals are the guide path for the detailed design of reinforcement in the anchorage zone. It is necessary to keep applicable codes of practice up to date at regular periods in order to meet the requirement of infrastructure. The existing requirements of the IS 1343 design specification to compute bursting force do not effectively address the problem of anchorage zones of post-tensioning cables, leading to significant variations in the design practice and causing uncontrolled cracking and bursting of the end zone. The provision to calculate the bursting force in IS 1343:2012 is adopted from the experimental investigation of Zielinski and Rowe Although the equation does not consider all the influencing parameters which affect the magnitude of bursting force as well as it is conservative in most of the cases. By understanding the proper behavior of the anchorage zone under compressive stresses this equation can be modified.

The local zone and the general zone comprise the anchorage zone. The general zone is the section of the member across which the concentrated tendon force is transmitted to the overall cross-section, whereas the local zone is the region immediately ahead of the anchorage system. The tension failure in the anchorage zone is the main focus of this work. Prestressed concrete is the future of the construction industry; the application of post-tensioning force to concrete sections is considered one of the critical stages which should be performed carefully. While applying post-tensioning to the concrete member, there may be chances of the bursting of the section near the end zone. Proper bursting force evaluation is necessary for understanding stress distribution near the anchorage zone. This study considers the affecting parameters like duct, eccentricity, section dimensions, and plate geometry while analyzing the bursting force.

On the basis of numerical simulation and experimental program, a simplified equation is presented for bursting force evaluation, in the same form as presented by IS 1343 which holds more practical suitability. The proposed equation calculates the bursting force considering the other influencing parameters which are not present in the current form of the equation.

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| Fbst/Pk = 0.32-0.3(Ypo/Yo) |  |
| The equation given by IS 1343: 2012 | Tension in the anchorage zone |

**Keywords:** post-tensioned concrete, anchorage zone, anchorage set, transverse tensile stress, experimental evaluation, numerical analysis, IS: 1343.