

## **Study of the systems of construction in the traditional Ahmedabad houses: Query in earthquake resistance.**

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Aim: To study traditional construction of Ahmedabad in order to establish capability of structures to resist earthquakes.

The walled city [old city] of Ahmedabad which came into being on east bank of abarmati River, houses structures using traditional techniques of construction. There are several lessons to be learnt in the systems of making the old city, from plan organization of streets to construction of individual houses.

These are the very structures that have survived several natural calamities that devastated newer parts of the city and if the indigenous techniques of building are not studied vital information about how to build in Ahmedabad would be lost.

The grouping of houses into a pol is typical of Gujarat and especially of Ahmedabad. A pol is made of elementary rectangular units evolved linearly along the street (parallel wall grouping system) with minimum surface area towards the street. These units are narrow, deep and consist of two bodies with courtyard in between and linked up by passage ways. The general rule in making of these units is that the rear body is higher than the body looking on to the street. The walled city buildings have a specific manner of construction using brick and wood placed in dense street formation giving an opportunity to study structural systems for earthquake resistance in Ahmedabad.

The parallel wall grouping system gives rise to three different structural conditions namely,

1. The corner type
2. The shared wall type
3. The Haveli type.

The analysis of these three conditions would enrich a larger understanding of them acting as a single structural type- the pol. This structural behavior of the pol would help clarify the yet unclear understanding of structural systems in traditional construction of Ahmedabad.

The quest of this study is to find out whether these traditional structural systems provide a greater degree of resistance to earthquakes. The idealized modeling of alternative interpretations of behavior and 3D simulation techniques for analysis, will clarify the role of different materials and their construction systems within a structure.