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TITLE OF PROJECT:

**ARCHITECTURAL INNOVATIONS IN SMOG MITIGATION FOR
SUSTAINABLE URBAN DEVELOPMENT**

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ABSTRACT:

As per WHO report, air pollution is responsible for more than 7 million premature death each year. Increasing day by day pollution include exhaust fumes from large factories, burning coal in furnaces, car exhaust fumes etcetera. These all are the biggest cause of smog and the source of air pollution. Specially we talk about cement industry. In 2022, the cement industry emitted 1.6 billion metric tons of CO₂. That is responsible for about 5% of global carbon dioxide (CO₂) emissions. This research focuses about the smog mitigation. Some of other country like Italy and Mexico working on Smoke eating building concept. Smog-eating buildings are made to absorb pollutants from the air, thereby assisting in the reduction of air pollution in metropolitan areas. Photocatalytically treated materials are used in the construction of these buildings. When this type of building surface is exposed to sunshine, contaminants are broken down into less dangerous elements like water and carbon dioxide. Nanosilver, titanium dioxide, nanocopper, nanoplatin, zirconium dioxide, zinc dioxide, graphene, nanotubes and carbon nanofibers are among the most widely used Photocatalytically treated materials. One of the most commonly used nano additives is nano-TiO₂, which has specific physical and chemical properties. The use of photocatalytic technology is closely linked with the campaign for Sustainable Development. The research discusses the photocatalytic properties of titanium dioxide. The test results of TioCem (contains nanosized titanium dioxide) CEM II/A-S 42.5 cement and Portland CEM I 42.5 cement based on experiments performed with bars made of standardized mortar are presented. The results offer insights into the potential of incorporating such technologies into the cement industry, aligning with the broader campaign for Sustainable Development. The findings aim to contribute to the ongoing discourse surrounding sustainable urban development and inspire further exploration and implementation of Smog-Eating Buildings in the Indian context.

KEYWORDS: Photocatalytic technology, Cement reduction, Pollution mitigation, Sustainable development,

CATEGORY: CONCRETE TECHNOLOGY AND BUILDING MATERIALS