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EdenCrete® – Strong Trial Results in India's Huge Concrete Market

HIGHLIGHTS

- Encouraging trial results with EdenCrete® products in multiple Indian concrete applications for the Delhi area.
- Special focus has been and will continue to be on:
 - Flexural strength and abrasion resistance for road application at low-cost dosages.
 - Addition of strength buffer in high-strength mixes, from 50 MPa and above, for high-rise applications, allowing cost-reduction from reduced Ordinary Portland Cement (OPC) and expensive micro silica additions in the concrete mixes.
- Encouraging trial results for concrete performance and cost reduction have been received from recent trials in the Delhi area comparing Eden's carbon nanotube-enriched EdenCrete® concrete to standard concrete mixes.
- The trials have been conducted in parallel with multiple parties from three market sectors.
- The parties comprise:
 - Independent Indian ready-mix concrete companies,
 - High-rise property developers, and
 - a leading Government agency (CRRI).
- The trials are all continuing based on the positive results and feedback from the parties involved.
- As a result, it is Eden's intention to expand trials in the Delhi area as well as other Indian areas with significant high-rise activity, and to increase its staff count to accommodate the increased interest.
- Some of the results received to date are:
 - 28% abrasion reduction achieved at low-cost dosages in road mixes; and
 - 10% to 20% extra strength achieved in high-strength concrete mixes after lowering the cost from reduced cement.

- Rapid growth over the past 5 years has occurred across the entire Indian concrete market, with India now being the second largest construction growth market in the world, closely behind China, and having passed the USA.
- Relevantly, the Indian government has allocated a record ₹12.20 lakh crore (12.2 trillion INR or approximately USD135 billion) to infrastructure spending for FY2026–27 alone.
- An extraordinary increase in construction of new high-rise residential apartment developments is underway in the Delhi area, and in India in general, frequently being associated with concurrent major industrial projects. The focus on high-rise construction means that Indian RMC plants in major cities have an unusual high percentage of their concrete in the high strength segment.
- Since 2014 India has built approximately 50,000 kms of new concrete highways (out of a total of approximately 100,000 kms of highways including asphalt) and continues building approximately 4 kms of new concrete highways per day.

DETAILS

- Eden Innovations Ltd (“Eden”) (ASX: EDE) is delighted to report that a suite of recent important Indian trials with EdenCrete®Pz7 enriched concrete, have all demonstrated significant performance improvements and/or mix design cost-reduction opportunities.
- These trials, being undertaken with ready-mix concrete companies, private developers, and an Indian government agency (CRRI), have produced encouraging early results showing:
 - Increased strength of High Strength Concrete, 50 MPa and above, immediately convertible to significant cost-savings for these mixes;
 - The strength buffer generated by the addition of EdenCrete®Pz7 enables replacement of a meaningful percentage of both expensive OPC and micro silica mix contents, with much cheaper supplementary cementitious materials (SCMs) such as fly ash or slag. India still produces over 500 million tonnes per year of fly ash from coal-fired power stations, much of which is suitable for use as an SCM;
 - Improved other performance characteristics of the concrete; and
 - Significantly reduced the CO₂ footprint through the reduced use of OPC and/or increased replacement with far lower CO₂ intense SCMs (such as fly ash).
- Examples of the results achieved to date in these trials include:
 - 28% abrasion reduction at low-cost dosages in medium strength road mixes. This comes along with increased flexural strength, which are some of the main performance benefits relevant for concrete to be used in road applications.
 - Achieving 10% to 20% extra strength from already cementitious reduced and cost optimized alternative high strength mix designs vs original versions, whilst allowing for further cost reduction or increased safety buffer.

Indian Concrete Market

The Indian construction and concrete markets have experienced massive growth over the past five years (2021–2026), confirming India as the **world's second-largest construction growth market**, right behind China and surpassing the USA.

Driven by record-breaking government capital expenditure and massive urbanization, the Indian construction market expanded significantly, with concrete and cement demands growing at a compound annual growth rate (CAGR) of **approximately 7% to 14%** across different segments over the last five fiscal years.

The government allocated a record **₹12.20 lakh crore (12.2 trillion Indian Rupees or around USD 135 billion)** to infrastructure spending for **FY2026–27** alone. This immense push has triggered massive capital expansions, with the domestic cement industry investing over ₹1,300 billion in new grinding capacities and ready-mix plants to keep up with nationwide engineering projects.

Major Growth Market Sectors in India

- **Residential Real Estate:** Accounting for roughly **44.6% of the construction market share**, the housing sector remains the largest individual volume consumer of concrete.
- **Infrastructure (Transportation & Connectivity):** This sector is the primary catalyst for concrete volume surges, jumping to about **29%–31% of total cement demand**. Massive road schemes, high-speed rail corridors, metro lines, and international airports have consumed, and are still, consuming millions of tonnes of industrial concrete.
- **Commercial & Industrial Real Estate:** Fuelled by the "Make in India" initiative, there is exponential growth in specialized industrial concrete requirements. High-strength concrete variants are utilised in various of aspects of constructing automotive factories, fulfillment warehouses, and modern **Data Centre hubs** springing up around Mumbai and Maharashtra generally.

High-Rise Urban Construction

India's metropolitan skylines, particularly in Mumbai, the National Capital Region (NCR) (including Delhi), and Bengaluru, have experienced significant changes. Engineering bodies have noted a crucial technical evolution from ordinary cement to **high-strength reinforced concrete (RCC)** to support structures exceeding 250 to 300 metres safely. The market has also widely adopted **precast architectural concrete panels and post-tensioning methods**, which dramatically lighten building loads and cut project timelines by up to 50%.



Photo 1. Indian high rise apartment project, not necessarily involving Eden's trials



Photo 2. Indian high rise apartment project in Noida, not necessarily involving Eden's trials

Large-Scale Concrete Highways & Expressways

The road sector has been the most visible beneficiary of India's physical infrastructure deployment. Moving away from standard asphalt, national projects like the **Delhi-Vadodara-Mumbai to Delhi Expressway corridor**, a **1,382-kilometre-long highway joining the national capital with the national financial centre**, shifted fully to heavy-duty rigid concrete pavements. is one of the most prominent mega-infrastructure assets in India. Requiring millions of cubic metres of high-durability pavement quality concrete (PQC), it features continuous, rigid-pavement construction designed to handle intensive heavy freight transport between the national capital and India's financial hub.

Rigid concrete highways offer a significantly longer operational lifespan, requiring fewer repairs under heavy commercial loads. India achieved record-breaking construction speeds by using automated slip-form concrete pavers capable of laying kilometres of multi-lane highway in single-day windows.



Photo 3. Delhi to Mumbai Expressway (The Economic Times). Not associated with Eden's recent trials.

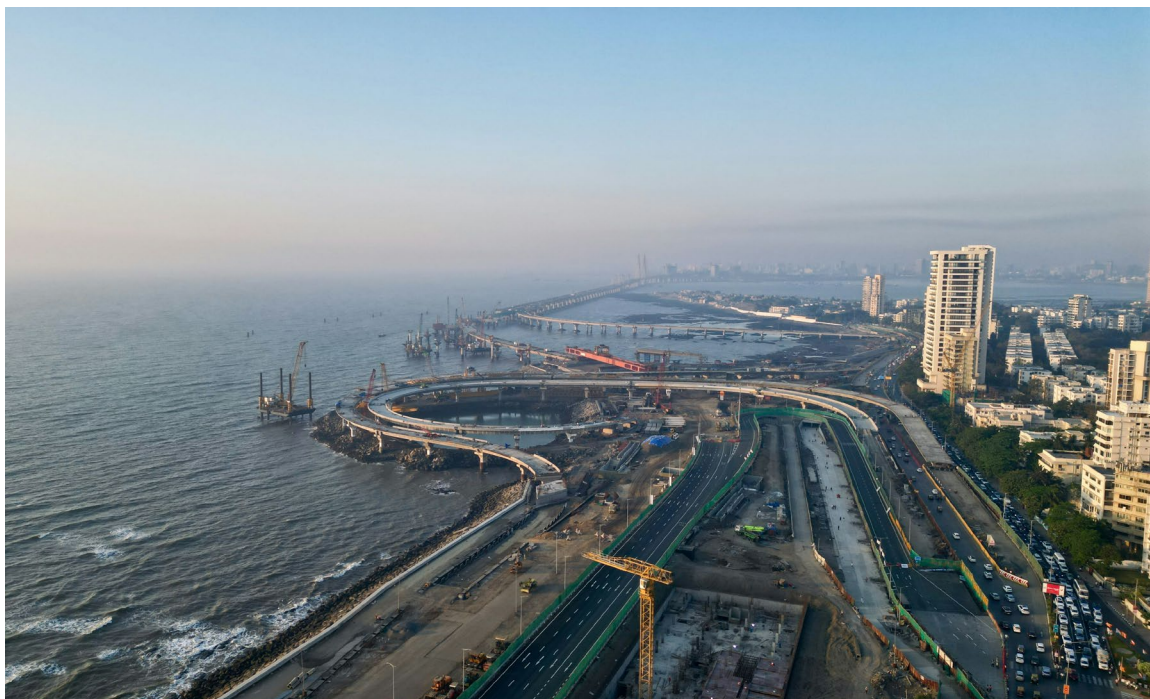


Photo 4. Road construction in India. Not associated with Eden's recent trials.

Hyperscale Data Centres

Driven by sovereign data laws, 5G deployment, and AI computing, India's data centre capacity crossed the **1 GW threshold**, triggering an unprecedented surge in heavy civil buildouts. These facilities are structural fortresses requiring highly dense concrete foundations to insulate massive server loads, backup generators, and cooling hubs.

- **The Sustainability Dilemma:** Reports by JLL India and environmental groups point out that this specific segment is driving a massive wave of low-carbon concrete adoption. Because tech conglomerates require strict compliance with global ESG goals, operators in hubs like Mumbai, Chennai, and Hyderabad are transitioning toward pre-engineered hybrid frames or eco-certified cement alternatives to curb embedded carbon footprints.

Key Market Literature & References ¹.

To read the primary economic data and market forecasts, check the official publications released by leading institutional analysts:

1. **ICRA Research Reports:** Track real-time production, price jumps per bag, and volumetric demand indexes within the industrial sector.
2. **CRISIL Industry Reports (via JSW Cement / HDFC True):** Detail the macroeconomic transition of concrete deployment shifting into national asset building.
3. **JLL India Data Centre Dynamics:** Provides full updates regarding geographic growth across primary regions like Mumbai and Noida.

Growth of Indian Concrete Market ¹.

The Indian concrete and cement market is experiencing a massive surge, with cement demand growing at a rate often outpacing the country's GDP growth. This boom is driven by aggressive government capital expenditure on infrastructure, technological shifts towards precast technology, and urbanization in many parts of India.

Key Growth Drivers and Market Trends

- **Massive Infrastructure Spending:** Flagship government initiatives like PM Gati Shakti and heavy investments in roads, metros, airports, and urban development have driven infrastructure's share of cement demand up to over 30%.
- **Rise of Ready-Mix Concrete (RMC):** Urbanization and the need for faster, uniform construction timelines are pushing massive demand for RMC and on-site transit mix segments.
- **Precast Adoption:** The market is seeing rapid uptake in precast concrete (like beams, slabs, and columns) to enable rapid residential construction. For example, 3D modular precast systems have already been successfully piloted in mass housing projects.
- **Sustainable and High-Performance Materials:** There is a strong industry shift toward durable concrete that requires less maintenance and reduces carbon footprints, utilizing supplementary materials like fly ash and slag.
- **A dramatic increase in the construction of high-rise apartment towers** - over 60 stories high, requires higher strength, lower cost concrete.

CRR I Trials

EdenCrete®Pz Concrete Trials Currently Underway in India with CRR I

The Central Road Research Institute (CRR I) operates under India's Council of Scientific and Industrial Research (CSIR - Central Road Research Institute), and is a premier national laboratory dedicated to pioneering sustainable, localized concrete technologies and materials for India's highway and runway infrastructure.

The two grades of concrete now being tested with EdenCrete® products are:

- M60 Grade Concrete for bridge over-lay and ultra-thin white topping concrete road repairs;
- M40 Pavement Quality Concrete is regularly used in making of new roads and pavements.

If the desired performance improvements are achieved in this trial, it could lead to a material increase in EdenCrete product sales across the Indian Government's infrastructure projects.

Further trials with CRR I are scheduled.

CRR I- Concrete Technologies & Research Areas

CRR I focuses heavily on adapting concrete engineering for India's extreme climatic conditions and heavy traffic. Primary research areas include:

- Rigid Pavements & Overlays: The institute heavily promotes Roller compacted concrete for pavements and Ultra-Thin White Topping (UTWT) using high-performance fibre reinforcement to extend the lifespan of existing bituminous roads.
- Industrial Byproduct Utilization: CRR I studies the use of Ground Granulated Blast Furnace Slag (GGBFS) and steel slag as partial cement replacements to build robust, climate-resilient roads.
- Sustainable & Lightweight Mixes: In collaboration with CSIR-CBRI, the institute conducts research on advanced, sustainable lightweight concrete and uses advanced concrete admixtures (like EdenCrete®) to enhance durability

CRR I- Current Recommended Fly-Ash and Slag Replacement Rates

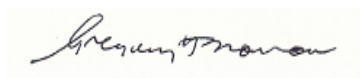
Current CSIR-Central Road Research Institute (CRR I) and Indian Roads Congress (IRC) guidelines recommend replacing Ordinary Portland Cement (OPC) with Supplementary Cementitious Materials (SCMs) at 15% to 30% for fly ash and 50% to 70% for slag (GGBS) in highways and bridge construction.

CONCLUSION

EdenCrete® enhanced concrete has outperformed the standard concrete mixes in the various trials that have recently been conducted, using higher levels of fly-ash in the concrete with low dosages of EdenCrete®Pz7, resulting in stronger, cheaper concrete with lower CO₂ footprints, offering attractive alternatives to the current, higher priced materials presently being used.

With a huge existing concrete market, with enormous growth projected across all market sectors, Eden is confident that when the current trials are completed, if the early results are repeated, that EdenCrete® products have a huge emerging market in India that could well be Eden's largest market in the world.

1. <https://www.zkg.de/en/artikel/cement-market-special-india-4187733.html>



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This announcement was authorised by the above signatory.
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