SmartCrete CRC

Research programs and proposed projects

Program 1: Engineering Solutions

This program is concerned with improving the way we engineer concrete structures and includes development of smart cladding, reduced noise pavements, 3D printed concrete structures, lightweight concretes and safety in design.

Accelerated standards development for innovation

Project 1. Accelerated innovation pathways for concrete via an integrated Australian Standards methodology to facilitate industry innovation

New materials for concrete durability

Project 2. Project Smart concrete with self-healing abilities

Project 3. Corrosion resistant concrete

Project 4. Mechanical and fire-resistant concrete FRP/FRC

Project 5. Development of lightweight green concrete for structural insulated panels

Project 6. Concrete corrosion and marine life

Construction and maintenance processes

Project 7. Development of advanced self-compacting slabs to support new construction methodologies and off-site manufacturing

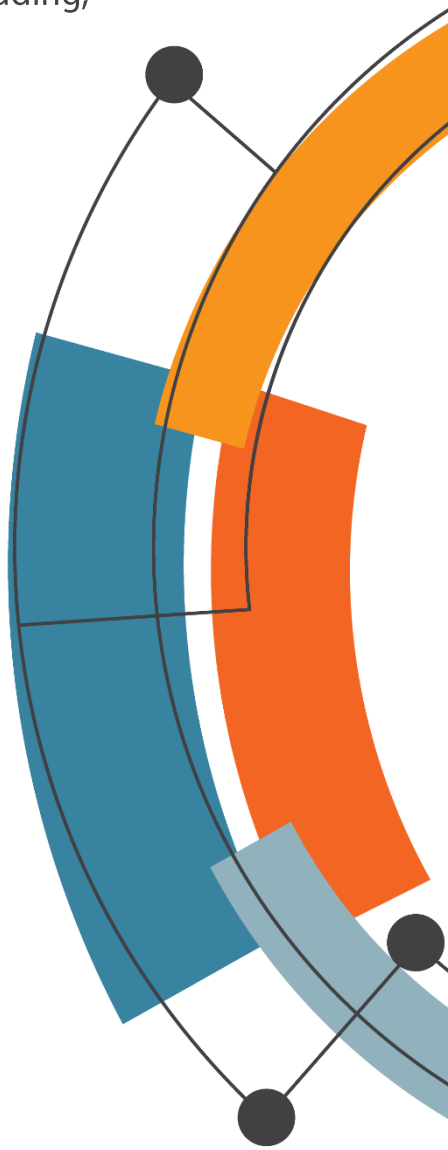
Project 8. Improved pavement design

Project 9. Lightweight concretes and cladding

Project 10. 3D printing of structures and claddings

Project 11. Design optimisation and new methodologies to improve in situ concrete performance

Project 12. Step change improvements in high-performance concrete to enable new construction methodologies and lower costs



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Program 2: Asset Management

This program is concerned with the way we manage our concrete assets and incudes development of sensing systems to monitor structural health and usage and inform lifetime models.

Sensor solution modelling

Project 1. Problem analysis and development of evaluation criteria for site testing

Project 2. Asset analysis and economic modelling

New sensor system development

Project 3. Sensors development e.g. contact sensors, photonic sensors etc.

Project 4. Sensor delivery and deployment

Project 5. Reduced cost through new infrastructure and volume scaling

Project 6. Smart sensor technology for structural health monitoring of key infrastructure

Lifetime predictive modelling & human integration

Project 7. Integrated systems and processes to enable substantial disruptive productivity improvements

Project 8. Standardised predictive modelling of asset life-cycle

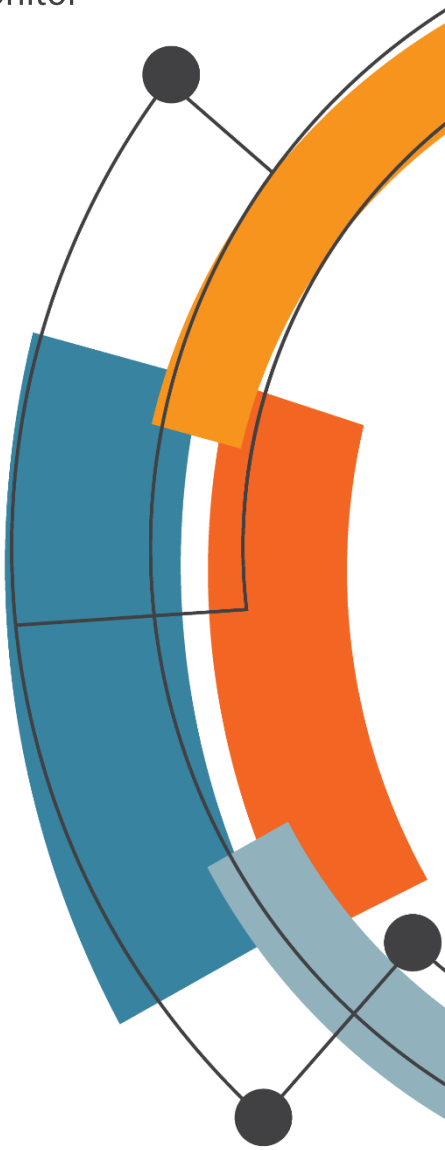
Project 9. An integrated engineer friendly software package for condition monitoring & asset management of transport infrastructure

Asset management application area

Project 10. Embedded sensing and condition monitoring of infrastructure health

Project 11. Automated compliance quality monitoring on-site of precast elements

Project 12. Demonstration and prototyping of SmartCrete productions in a Living Laboratory



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Program 3: Sustainability, Environmental & Disposal

Sustainability includes the development of self-healing, fire resistance, stronger and more durable concrete. Environmental includes bio-concrete, use of artificial aggregate, C02 absorbing concrete, luminescent concrete, energy producing concrete, material availability, waste disposal in concrete and cement less concrete. Disposal includes recycling and reuse.

Circular Economy

Project 1. Incorporation of Industrial waste in concrete. (e.g. rubber, ash, slag)

Project 2. Incorporation of domestic waste in concrete (e.g. plastic, glass, wood, metal)

Project 3. Development of new methods of Ash production

Project 4. Development of biomass as an artificial aggregate

Project 5. Recycling and reuse of concrete

Project 6. Market identification, development and market structure of recycled products

Project 7. Circular economy evaluation and assessment with a focus on material choice

Specification for new improved performance materials

Project 8. Value added formulations e.g. energy producing concrete

Project 9. Accelerated adoption of recycled concrete via the development of concrete formulations for low performance environments

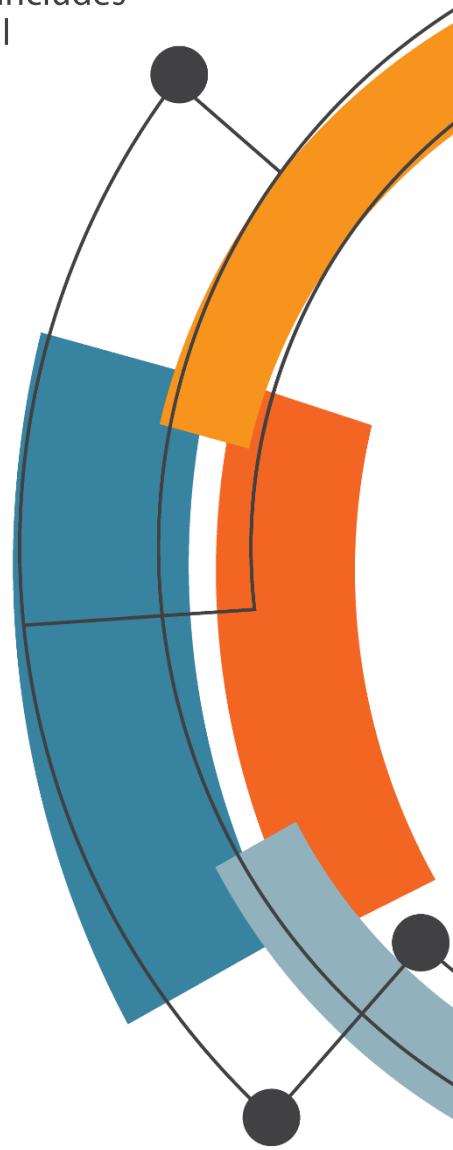
Supply chain optimisation

Project 10. Development of viable alternative materials based on quality, cost, effectiveness, process engineering and sustainable supply

Project 11. Optimising use of recycled aggregates in concrete production and application

Project 12. Optimising supply chain e.g. reducing supply transport and site costs

Project 13. Regulatory standards to mitigate emissions from road transport of SmartCrete



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Program 3: Sustainability, Environmental & Disposal

Supply chain quantification

Project 14. Financial modelling and guaranteeing the supply chain

Project 15. The geopolitical context for alliance in concrete materials to produce SmartCrete within sustainable development principles

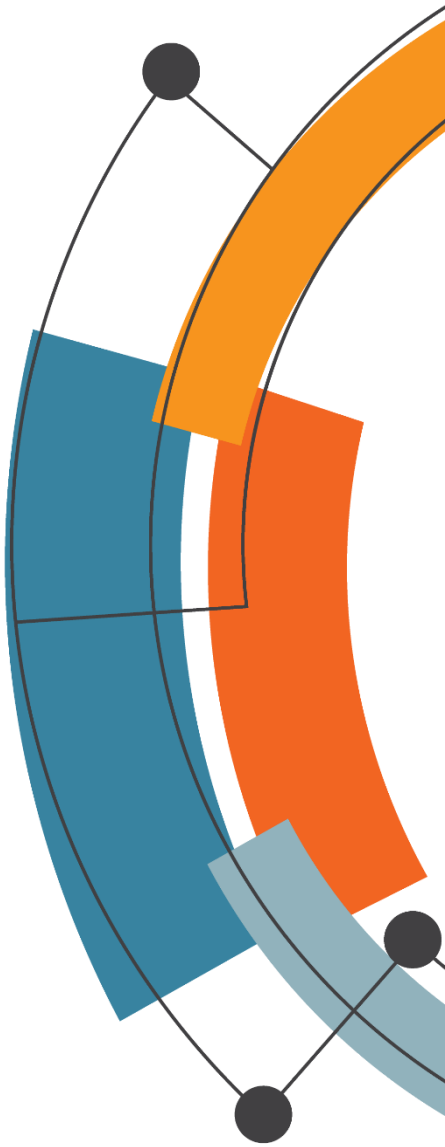
Project 16. Framework for economic evaluation of new innovations

Project 17. Commercialisation: new product development: lab to market

Reduction of carbon footprint

Project 18. Development of high-performance green concrete

Project 19. AI-enable techniques to predict and reduce carbon footprint



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