

# Annual Report

2020-2021



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Our goal is  
to guarantee  
the long-term  
viability of  
vital concrete  
infrastructure  
in Australia

# About SmartCrete CRC

**SmartCrete CRC is a collaboration of the Commonwealth Government, industry, asset owners, small medium enterprises (SMEs), the supply chain and academic community to step-change Australian concrete research and development (R&D), address pressing industry problems, improve supply chain security, lower costs and carbon footprint, and improve durability. The Cooperative Research Centre (CRC) will deliver material change, enable innovative solutions, improve asset management and supply chain sustainability, provide new export markets and standards as well as technology ready workforce.**

Concrete is the second most used material on earth after water and is a fundamental element of the built environment and Australia's economic growth over the next 10 years. SmartCrete CRC will shift the current disparate siloed projects and build on them through a nationally coordinated and collaborative platform for R&D in Australia, maximising research investment to pressing problem areas and delivering new certified standards and a technology-ready workforce for industry wide improvement to ultimately achieve Government priorities. Our vision is to fully develop integrated product development and systems capability.

**SmartCrete CRC is based on developing measurable integrated end use outcomes for industry to address the problems identified by asset owners, industry organisations, SMEs, the supply chain and academic community.**

SmartCrete CRC is a true industry led collaborative research partnership bringing together the leading industry, SMEs, research, agencies and associations from across Australia and globally, to focus on innovation covering engineered solutions, asset management and sustainability. Our consortium currently has nearly \$90 million of resources to step change the concrete sector and significantly improve productivity in Australia and internationally over the next seven years.

Smartcrete CRCs success will include:

- Consolidation of the disparate current research
- Delivering tangible outcomes in:
  - reduced cost
  - improved construction methods
  - supply chain logistics
  - skills development through education and industry associations
  - competitive procurement
  - increased application of new sensor technology,
  - improved asset durability and lower maintenance costs through predictive asset management and new commercial process facilities including 3D printing



Australian Government

Department of Industry, Science,  
Energy and Resources

**AusIndustry**  
Cooperative Research  
Centres Program

- An accelerated approach to Australian Standards, codes and specifications
- Improved confidence in the supply chain
- Provide alternative materials from waste streams for Australia and export markets that result in circular economy benefits from repurposed waste materials
- Lower CO<sub>2</sub> emissions
- Provide a portal for international best practice and Australian trade export opportunities.

Conservative industry metrics from BIS Oxford indicate a realistic saving of \$600 million through a 2% reduction in ash substitution, a 2% reduction in labour costs and a 10% reduction in aggregate costs.

SmartCrete CRC is an incorporated company, limited by guarantee. The company is based in Macquarie Park, New South Wales in close proximity to many of our industry partners. The governance model is based on the principles and recommendations of the CRC Program Round 21 Guidelines.

**SmartCrete CRC is uniquely placed with the appropriate skills, experience, funding, infrastructure and IP to understand the challenges (especially across the critical supply chain) and deliver tangible and measurable outcomes.**

4

EMPLOYEES

46

PARTNERS

31

PROSPECTIVE PARTNERS

2

PROJECT AGREEMENTS EXECUTED

8

ROUND ONE PROJECTS APPROVED BY BOARD

3

FAST TRACK PROJECTS APPROVED BY BOARD

1

STRATEGIC PROJECT APPROVED BY BOARD

# Partners

SmartCrete CRC fosters collaborative research engagement in a shared purpose, the consideration of alternatives, an industry wide consensus on problem solving, industry participation, shared knowledge and a willingness to find common ground.

SmartCrete CRC is the first CRC Program led by Macquarie University and was founded on existing relationships and work streams with other major universities and industrial partners.

A CRC grant supports medium to long term industry-led collaborations to solve industry problems and deliver tangible outcomes, with a focus on improving the competitiveness, productivity and sustainability of industries; providing an industry focused education and training program; and strategies that build the R&D capacity, deploy research outputs; and encourage take-up by the industry.

The collaborative platform is necessary to deliver tangible solutions for local and international markets with productivity improvements, industry-wide engagement, supply chain concentration, industry innovation, research delivery, market inactivity and access to adjacent markets.

SmartCrete CRC has played a pivotal role in facilitating partnerships within the academic and concrete industry ecosystem, incorporating concrete and material associations and industry lobbying bodies that facilitate collaboration of pathways to market. An essential role in this is often not possible without asset owners specifying materials or engineering solutions and through financial contribution in research projects or in-kind participation to support and guide the directive for a realistic commercialisation outcome.

Significant work was put in by the bid and establishment team to provide a balanced portfolio of partners, in an industry that had traditionally not been seen as a strong environment for collaborative research.

## PARTNER CONTRIBUTIONS

86%

TOTAL VALUE OF CONTRIBUTIONS  
IN THE GRANT AGREEMENT SECURED

\$2.2m

CASH RECEIVED FROM  
PARTNERS 2020-2021

90%

TOTAL VALUE OF CASH CONTRIBUTIONS  
IN THE GRANT AGREEMENT SECURED

A series of workshops with partners established the broad research programs and identified specific project outcomes aligned to the industry's needs.

This alignment established the value proposition for core partners across three theme areas: Engineered Solutions, Asset Management and Sustainability, for SmartCrete CRCs seven-year duration.

*“Concrete being the second largest commodity used in the world, the SmartCrete CRC is addressing an urgent need of the concrete industry in supporting research towards sustainable materials and intelligent infrastructure. Co-creation opportunities provided by the partnerships of industry and academia will open up shorter pathways to impact.”*

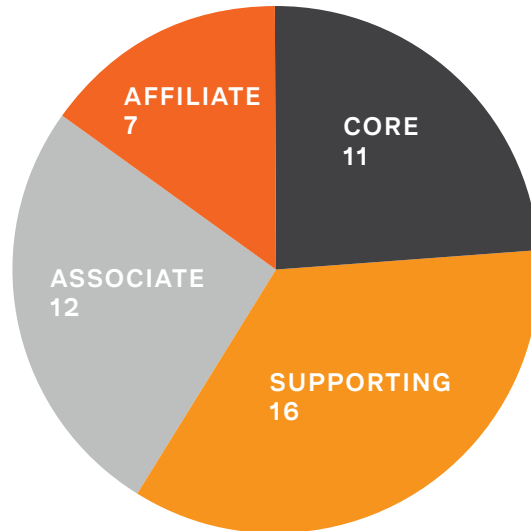
Professor Sujeeva Setunge (RMIT)

As at 30 June 2021, SmartCrete CRC has 46 partners. Paintback Limited has joined as a core partner organisation identified through our circular economy focus and will assist in developing the research portfolio targeted towards the future sustainability of concrete infrastructure.

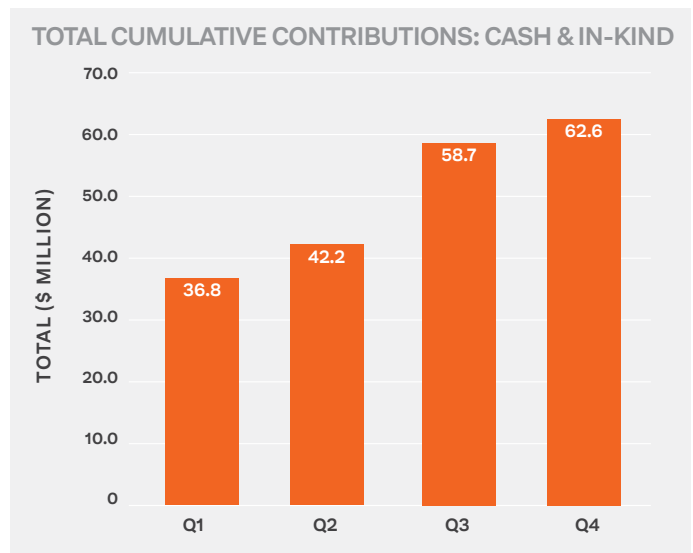
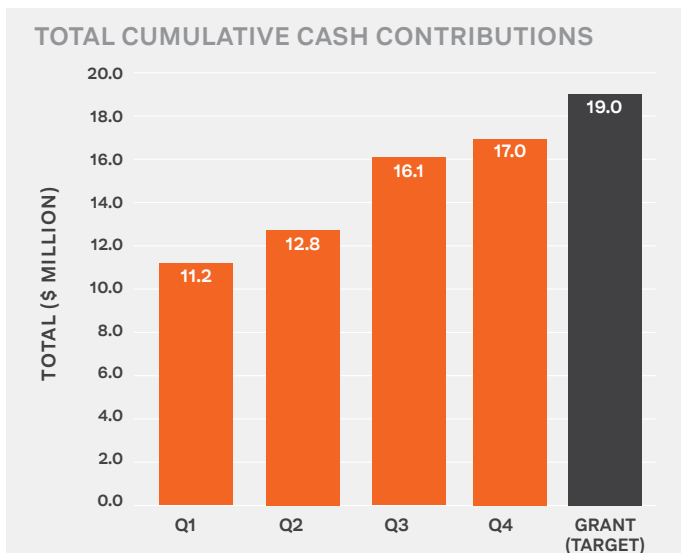
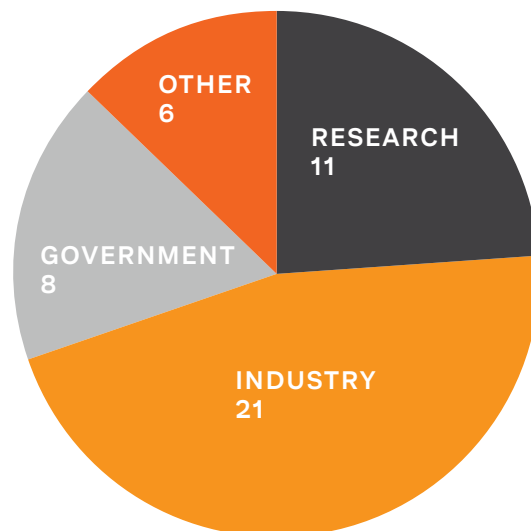
*“SmartCrete CRC is evaluating a few research projects for use in industrial and non-industrial wastes in concrete mixes to improve sustainability and the carbon footprint of concrete while meeting performance requirements.”*

Harish Srivastava (Transport for NSW)

#### PARTNER NUMBERS BY LEVEL



#### PARTNER NUMBERS BY SECTOR



# Partners





The following table lists SmartCrete CRCs 46 partners as at 30 June 2021.

NAME	ABN	PARTNER LEVEL	SECTOR
Adelaide Brighton Cement Limited	96 007 870 199	Affiliate	Industry
Ash Development Association of Australia (ADAA)	79 053 753 772	Supporting	Industry Associations
Asset Management Council Limited (AMC)	15 141 532 747	Associate	Industry Associations
Australasian Pozzolan Association Inc (APoZA)	22 520 652 890	Supporting	Industry Associations
Australasian Slag Association (ASA)	98 481 250 549	Supporting	Industry Associations
Australian Engineered Fasteners and Anchors Council (AEFAC)	N/A	Supporting	Industry
Austrroads Ltd	16 245 787 323	Supporting	Industry
BG&E Pty Limited	67 150 804 603	Supporting	Industry
Cement, Concrete & Aggregates Australia (CCAA)	34 000 020 486	Associate	Industry Associations
Cement Industry Federation	59 008 468 639	Supporting	Industry
Concrush Pty Ltd	29 097 606 543	Affiliate	Industry
Consulting & Implementation Services (CIS)	25 064 052 615	Core	Industry
Council of the City of Ryde	81 621 292 610	Supporting	Government
Curtin University	99 143 842 569	Supporting	Research
Department of Treasury and Finance (Office of Projects Victoria)	44 128 890 975	Supporting	Government
Expanded Glass Technologies Pty Ltd	26 622 340 265	Associate	Industry
Hawks Excavation (VIC) Pty Ltd	39 631 279 564	Supporting	Industry
Holcim (Australia) Pty Ltd	87 099 732 297	Associate	Industry
Hunter Water Corporation	46 228 513 446	Associate	Government
La Trobe University (LTU)	64 804 735 113	Core	Research
Macquarie University	90 952 801 237	Core	Research
Melbourne Water Corporation	81 945 386 953	Affiliate	Government
Mike Ritchie and Associates Pty Ltd (MRA Consulting)	13 143 273 812	Associate	Industry
Mint Innovation Limited	N/A	Affiliate	Industry
N2N AI Pty Ltd	30 636 735 263	Associate	Industry
NetCentrix Pty Ltd	42 104 514 605	Core	Industry
Paintback Limited	55 610 171 312	Core	Industry
Qingdao HDMECH Intelligent Equipment Co Ltd	N/A	Associate	Industry
Royal Melbourne Institute of Technology (RMIT)	49 781 030 034	Supporting	Research
Sichuan Highway Planning Survey Design and Research Institute	N/A	Affiliate	Research
SMY Operations Pty Ltd	N/A	Core	Industry
South East Water Corporation (SEW)	89 066 902 547	Associate	Government
Stretford Civil Constructions Pty Ltd	97 619 743 869	Supporting	Industry
Sustainable Built Environment National Research Centre (SBEnrc)	N/A	Core	Industry
Swinburne University of Technology (SUT)	13 628 586 699	Supporting	Research
Sydney Water Corporation	49 776 225 038	Supporting	Government
The Trustee for Vinsi Partners Unit Trust	62 830 275 958	Associate	Industry
Transport for NSW (TfNSW)	18 804 239 602	Core	Government
University of Newcastle (UoN)	15 736 576 735	Affiliate	Research
University of South Australia (UniSA)	37 191 313 308	Affiliate	Research
University of Sydney (USyd)	15 211 513 464	Core	Research
University of Technology Sydney (UTS)	77 257 686 961	Core	Research
Water Services Association of Australia Limited (WSAA)	54 117 907 285	Associate	Industry Associations
Western Sydney University (WSU)	53 014 069 881	Core	Research
Whitehorse City Council	39 549 568 822	Associate	Government
Zeolite Australia Pty Limited	61 000 038 497	Supporting	Industry

# Chair's Report

**In the spirit of reconciliation, SmartCrete CRC acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past and present and extend that respect to all Aboriginal and Torres Strait Islander peoples today.**

SmartCrete CRCs journey commenced in 2019 with the decision by Macquarie University to underwrite a CRC. After the bid's success was announced in February 2020, and despite the challenges of COVID-19, an active establishment team, program management committee, energetic Interim Chief Executive Officer (CEO), Interim Board and engaged partners facilitated rapid establishment. By the November 2020 Annual General Meeting, the legal and operational structure was in place and governance transitioned to an independent Board of Directors. Together with the Company Secretary, the CEO and SmartCrete CRCs team, the Directors provide broad and deep skill sets designed to drive SmartCrete CRCs concrete sustainable material and intelligent infrastructure agenda.

Concrete is an industry with limited and spasmodic industry and research engagement. It is heavily controlled by tradition, precedence and standards to ensure the health, welfare and safety of the community, and has a high failure rate for innovation implementation. During the establishment phase of SmartCrete CRC, it was imperative to evolve and optimise decision pathways and project structures to avoid innovation failure and ensure implementation-ready research outcomes. This led to a necessary pause in approvals as research proposals were reconfigured to ensure critical enabling communities, such as standards, were embedded as active participants and robust commercialisation/implementation pathways



were articulated at the project proposal stage. While there were delays to fast tracking investment, our pipeline now has a number of quality research projects emerging with three fast track projects approved, one strategic project underway and eight projects conditionally approved.

SmartCrete CRCs concrete ecosystem encompasses industries and stakeholders well beyond the assumed resources and infrastructure profile. We are building partnerships that encompass a broad range of sectors and disciplines as we innovate materials and intelligent asset management. Recently, we welcomed a new core partner, Paintback; an entity driven by the Australian paint industry to repurpose unwanted paint and packaging.

Our first outcome, the concrete decarbonisation roadmap as part of the Decarbonisation Pathway for the Australian

Cement and Concrete Sector, was a strategic initiative of our CEO in collaboration with RACE CRC and the Cement Industry Federation. It is due for release in the coming weeks and establishes the transformation agenda for our concrete ecosystem. Our next steps include working with our core and other partners to refine our milestone targets as our engagement with the roadmap, industry and research outcomes evolves our understanding.

Many people and organisations have contributed to our successes during this financial period. Each contribution has been vital in testing and shaping ideas and practices. At some stage, post COVID-19, it will be wonderful to be in a position to thank you all in person.

In the meantime, on behalf of the Board, I thank the Commonwealth Government's CRC Program for its forward leaning support and advice during our start-up phase, Macquarie University and our partners who, despite their own difficult COVID-19 journeys, have maintained their interest and support.

These past months have been a period of significant pressure on our small team. The staff have exceeded expectations and we cannot thank them enough for their professionalism. In particular, they are always inquisitive and looking for innovative solutions to create effective operational practices.

SmartCrete CRC has embraced diversity and the value diversity has brought to our deliberations is high. Diversity has brought rigour and innovation to our thinking and increased the robustness and quality of the systems and processes to underpin our work moving forward.

SmartCrete CRC is well positioned to step change the Australian concrete ecosystem and address the broader social benefit agenda. We look forward to continuing our journey and learning with all our participants.

**Emeritus Professor Elizabeth Taylor AO FAICD**  
Independent Chair

**SmartCrete CRCs concrete ecosystem encompasses industries and stakeholders well beyond the assumed resources and infrastructure profile. We are building partnerships that encompass a broad range of sectors and disciplines as we innovate materials and intelligent asset management.**

# Chief Executive Officer's Report

**I am proud to be writing this report as Chief Executive Officer of SmartCrete CRC. Being our first year, there has been a steep learning pathway for the CRC and myself which has been exciting – learning to deal with extraordinary industry conditions due to COVID-19; learning to construct a research funding entity in an industry unaccustomed to the CRC model; and learning to build a company to deliver relevant outcomes and value to partners, the Government and wider community.**

SmartCrete CRC continues to mature as an organisation with internal procedures being generated and refined, the project funding process having commenced and the continued growth of the CRCs industry and Government network. With a solid foundation created during this reporting period, we are moving firmly from an establishment phase into an operational phase where any challenges will be addressed in a methodical manner.

My time with SmartCrete CRC began in late September 2020, charged with the task of transforming the CRCs aspirational goals from the Bid Proposal into a functioning entity that will 'concrete' those aspirations. Under the direction of the Interim CEO and Board, SmartCrete CRC had acquired a new premises, a skeleton staff and developed the business practices which formed the foundation of the company. Recruitment of an independent Board was completed in November 2020, just prior to the inaugural Annual General Meeting. Since this time, our governance has been strengthened through the oversight of Board committees and collaborative meetings between the Board and executive staff.

Following these small steps, SmartCrete CRC has commissioned two projects, is working towards commissioning two more projects and has conditionally approved eight more projects - these will be funded subject to the successful resolution of matters in the relevant Project Agreement. These projects address our three research streams: Engineered Solutions, Asset Management and Sustainability. They also give a firm base upon which we will build our research portfolio.

SmartCrete CRCs aim is to be industry-led and from day one we have been busy facilitating conversations between our industry and academic partners to draw out the major issues and challenges for the industry which could be met



with the skills and capabilities of our academic partners. The Australian cement and concrete ecosystem has largely overlooked the opportunities offered by the CRC Program. Therefore, demonstrating the value that can be created by the cooperative approach to relevant research has been the initial goal of our efforts in stakeholder engagement. The success of our approach has seen SmartCrete CRC secure 46 partners, with the majority being from the concrete industry despite the adverse and challenging trading conditions over the past year.

During the year, SmartCrete CRC has revised the project development and approval process to improve the efficiency of handling the project proposals and the quality of proposals to meet contribution, industry investment and commercialisation outcomes. Initially, the Research Committee would review the full project proposals before passing them through the Board for approval. This process was found to be time and resource consuming, especially when the proposals did not meet the selection criteria. A review was undertaken early in 2021, resulting in a more efficient approach towards the consideration of preliminary proposals prior to developing the full proposal submission as well as providing an increased understanding of the proposal selection criteria with coaching provided to project leads during the proposal process to ensure the proposals are of a high quality for informed decision

making. Subject matter experts are then drawn upon to provide commentary on the relevance and strength of these proposals before presenting to the Portfolio Strategy Group and Board. In taking this approach, we expect to see relevant research commissioned in a timely manner, allowing the full realisation of outcomes to happen more rapidly.

Underpinning our research programs is turnKey CRC, a software solution developed especially for CRCs to manage their portfolio of projects. With SmartCrete CRC having limited resources and being the smallest CRC in terms of funding in the last four funding rounds, we have chosen to systematise as much of our operational requirements as possible to improve productivity and achieve the expectations of our stakeholders, the Commonwealth and our partners. However, there has been a great deal of customisation and development of the base system for our purposes. From this, we are certain turnKey will provide the level of information clarity and transparency required to ensure the development of a cooperative and intellectual approach to research between SmartCrete CRC and our partners.

Turning to the future, SmartCrete CRC will continue to focus on developing a strong partner and project portfolio, including furthering our stakeholder engagement drive in the cement and concrete ecosystem. SmartCrete CRC has moved through the 'forming' and 'storming' phase of organisational development and are now 'norming' our policies and procedures for the next six years of operation. With the final appointments to the executive team, SmartCrete CRC is well placed to provide valuable support to the Australian concrete industry by augmenting our research portfolio with informed projects addressing the needs of industry. We will be enhancing the skills and capabilities of our research partners through developing a SmartCrete CRC Education and Training Program to transfer knowledge into practice. This will be achieved in the next financial year with the full roll out of our Strategic and Operational Plans.

SmartCrete CRC has made excellent progress in establishing its presence in the concrete industry and our ambition to build on this solid foundation to meet the needs and expectations of all our stakeholders moving forward is on track.

I would like to acknowledge and thank our partners for their support and patience during our establishment year. Our Interim Board and CEO did a sterling job in setting our direction. I would also like to pay tribute to the hard work of our small team of employees who have gone beyond expectations in achieving the outcomes described in this Annual Report. Furthermore, the assistance and endorsement provided by our Board of Directors has enabled the organisation to rapidly progress.

SmartCrete CRC is open for business.

**Dr Warren South** B.Met., Ph.D, (Civil)

**SmartCrete CRCs aim is to be industry-led and from day one we have been busy facilitating conversations between our industry and academic partners to draw out the major issues and challenges for the industry**

# Executive Summary

**SmartCrete CRC is a collaboration of industry, asset owners, SMEs, the supply chain and academic community to shift Australian concrete R&D, maximise pressing industry problems, improve supply chain security, lower costs and carbon footprint, and improve durability. The CRC will deliver material change, enable innovative solutions, improve asset management and supply chain sustainability, provide new export markets and standards as well as technology ready workforce.**

The 2020-2021 financial period has been our first year of operation. SmartCrete CRC has achieved great success as enthusiasm and energy has driven the team and partners to accomplish the CRCs objectives. However, like other CRCs during their start-up phase, SmartCrete CRC has faced a number of operational and industry structural challenges. In addition, these challenges have been amplified with the impact of the COVID-19 pandemic on the Australian economy and businesses which the CRC has been targeting.

Despite this, SmartCrete CRCs major achievements during this period included:

- Establishing a robust CRC entity
- Securing high quality and strategic employees to drive industry participation
- Securing 46 partners resulting in \$36 million over the life of the CRC
- Approving three fast track projects across two of the research program themes (Asset Management and Sustainability)
- Developing a strategic project called the Decarbonisation Pathway for the Australian Cement and Concrete Sector which targets the Sustainability program theme
- Conditionally endorsing eight projects that will run for up to four years and involve industry partners collaborating with our research providers. These projects represent a cash investment of almost \$5.2 million of Commonwealth funds by the CRC and partner contributions.

Key challenges included:

- Effects of COVID-19 on partner contribution
- Increasing industry contributions and partnerships to support industry-led objectives. This includes breaking through the Australian cement and concrete ecosystem which has largely overlooked the opportunities offered by the CRC Program
- The realisation that a new development and approval process for research projects was required to ensure relevant research is commissioned in a timely manner.



# Highlights & Achievements

In January 2020, the Minister for Industry, the Honourable Karen Andrews MP, announced SmartCrete CRC was awarded \$21 million worth of funding under the CRC Program, with operations to commence in June 2020. The grant was vital to deliver the scale and timespan of investment required to transform SmartCrete CRCs objectives to eliminate the strain on the supply chain and the impacts to Australia's future economic growth.

Despite COVID-19 starting to impact the small establishment team under the Interim CEO, a number of important activities commenced, including:

- Creating the SmartCrete CRC corporate entity
- Registering as a charity with the Australian Charities and Not-for-profits Commission
- Developing our Communication Plan
- Finalising the program and project priorities with participants
- Completing Partnering Agreements with all 46 partners
- Signing the Grant Agreement with the Federal Government
- Establishing the corporate governance structure
- Recruiting key staff including the CEO
- Establishing the core operating system requirements
- Establishing the SmartCrete CRC office.

# 46

**PARTNER AGREEMENTS  
EXECUTED TO DATE**



**SMARTCRETE CRCs ACHIEVEMENTS DURING THE 2020-2021 FINANCIAL YEAR INCLUDE:**

**JANUARY 2020**

**Award of CRC funding**

**Appointment of Interim Board**

**APRIL 2020**

**JUNE 2020**

**Company incorporated**

**Initial Commonwealth funding received**

**JULY 2020**

**SEPTEMBER 2020**

**Core Partner Agreements executed resulting in \$36 million in partner commitments over seven years**

**Festival of Ideas workshop held with stakeholders from academia and industry**

**10 SEPTEMBER 2020**

**SEPTEMBER 2020**

**CEO Dr Warren South appointed**  
**Recruitment of core team of employees**

**Recruited and welcomed the Board of Directors at AGM**

**Interim Board retired**

**NOVEMBER 2020**

**JANUARY 2021**

**Establishment of Board Committees**  
**First SmartCrete CRC Fast Track Projects announced**

**Paintback Ltd joined as a Core Partner**  
**Fast Track Project approved for Recycled Material Concrete Production: Recycled Waste in Concrete for Municipal Applications**  
**Eight projects conditionally endorsed for funding**

**JUNE 2021**

# Commonwealth Milestones Achieved

**In the Commonwealth Grant Agreement, a number of milestones are outlined which frame the progress of the CRC. These milestones reflect the projects considered in the bid phase, with the timetable for satisfying these milestones set before the establishment of the CRC.**

During the course of the year, the timetable for these milestones has been revised and agreed with the Commonwealth in our quarterly reporting obligation under the Grant Agreement. Several of the projects first submitted in the bid proposal have been substantially delayed by the proponents.

However, with three fast track projects approved, one strategic project underway and eight projects conditionally endorsed in June 2021, SmartCrete CRC has already established the pathway for 38% of the total program milestones in the Commonwealth Agreement over the seven years, as shown in the table on the next page.

MILESTONE TITLE AND DESCRIPTION		NUMBER OF PROJECTS APPROVED IN 2020/21 CONTRIBUTING TO MILESTONE ACHIEVEMENT
<b>Program 1: Engineered Solutions</b>		
1.1.1	Integrated approach for standardisation in construction for innovative materials and methods.	1
1.1.2	Technical and engineering guidance in material selection of innovative concrete for construction.	2
1.1.4	Technical and engineering guidance in innovative approach to construction.	1
1.1.5	Evidence based quality control and quality assurance for construction with innovative concrete materials and methods.	1
1.1.6	Harmonised performance-based specifications and enforcement frameworks from Year 5 implemented. Appropriate training across the sector designed and delivered.	1
1.2.1	Investigate the properties of a new concrete materials such as strength, modulus, and durability properties.	2
1.2.4	Use field trials to verify the structural application of the new concrete materials and their properties at the structural level.	2
1.2.5	Create a numerical model and analytical prediction method to predict the structural behaviour and performance using the new concrete materials.	2
1.2.7	Roll out real world applications. First independent use of technology by contractors.	1
1.4.6	Prototype testing and first use.	1
1.5.4	Certification and standards development.	1
<b>Program 2: Asset Management</b>		
2.1.3	Field test within SmartCrete CRC community.	1
2.2.1	Develop a range of contact sensors such as: photonic, electrochemical, capacitive, magnetic, strain and seismic.	2
2.2.3	Develop integrated sensor systems and internet of compatibility.	2
2.2.4	Established partnerships for volume sensor installation, systems integration, and commissioning. First independent use of developed sensors.	1
2.4.2	Smart tool for data collection, analysis and prediction for infrastructure and utility lifespan maintenance management.	1
<b>Program 3: Sustainability</b>		
3.1.1	Analysis of samples from all potential sources of waste materials in Australia with potential application in concrete.	5
3.1.2	Physical and chemical properties of waste, by-products and recycled material samples collected.	7
3.1.3	Properties of concrete made with different percentages of above materials either as SCM or aggregate.	6
3.1.4	Optimisation based mix design system to allow maximal use of waste materials in any infrastructure development project.	5
3.1.5	Developing guidelines on minimum requirements for properties of different by-products, waste and recycled materials for use in concrete.	2
3.1.6	Experimental validation of the mix design model under chemical and mechanical loading.	2
3.2.1	Completion of existing market conditions and concrete supply chain study.	1
3.2.2	Strategies to reduce supply chain and transport cost validated by industry partners completed.	1
3.2.4	Carbon calculator of construction and demolition waste completed, and beta tested with end users.	1
3.3.1	Identification of a range of alternative materials for cement, sand, and aggregate.	2
3.3.2	Completed field trials and durability assessment.	3
3.3.3	Financial and carbon footprint modelling of these alternate materials.	2
3.3.4	Publication of a database of the alternate materials, their location, quantity and uses.	2
3.4.1	Publication of marketplace survey.	1
3.4.2	Report on economic barriers and facilitators.	1
3.4.6	First independent use of the software tools.	1
3.5.1	Development of sustainable concrete.	3
3.5.2	Financial model, life cycle assessment and life cycle costing methodologies for sustainable concrete.	4
3.5.3	Durability, pilot and field studies of sustainable concrete ready for commercialisation.	2

# Risks & Impediments

**The 2020-2021 financial reporting period has been an interesting year for all Australians with numerous challenges as a result of the COVID-19 pandemic. While this has had a major impact across the country, it is hard to quantify how this has contributed to the following impediments SmartCrete CRC has faced in achieving expected outcomes during this period.**

## **COVID-19**

The impacts of COVID-19 were experienced throughout the industry, including partners of the SmartCrete CRC. Some partners were unable to meet their financial obligations and some partners preferred to delay their investment in the CRC. SmartCrete CRC worked with these impacted partners to accommodate their individual situations in order to secure valuable industry participation.

While the further impacts of COVID-19 are unknown, SmartCrete CRC and the Audit, Risk, Privacy and Finance (ARPF) Committee are closely working together on robust mitigation strategies across all aspects of the CRC for the coming years.

## **PARTNER ENGAGEMENT**

Despite the challenging business conditions experienced during the financial year, SmartCrete CRC engaged proactively with potential CRC partners and achieved 86% of the level prescribed by the Commonwealth. With a solid commitment from university partners, a plan to attract additional key industry partners is well underway and management is confident that engagement levels will be well supported in the next financial year. Taking this approach will also increase the quality of potential research proposals to shift Australia's concrete R&D and maximise pressing industry problems to improve supply chain security, lower costs and carbon footprint, and improve durability.

SmartCrete CRC was fortunate to appoint two members of staff in March 2021, Director-Partnerships and Director-Industry Liaison. While these appointments brought with them extensive industry experience and networks, these

roles are also specifically charged with implementing the Partner Engagement Plan referred to earlier. Since their appointment, we have progressed to holding extensive discussions with major industry organisations with a view to joining as a core or supporting partner in just a few short months.

Further, with the publication of a project document as part of the Decarbonisation Pathway for the Australian Cement and Concrete Sector Research project, the opportunities for industry partnerships will be enhanced.


## **PROJECT PROGRESS**

Similar to other CRCs in their first year, the number of projects underway at year end is less than anticipated in our initial planning. Despite the optimism expressed at the commencement of the Fast Track Program, only one fast track project is underway as at 30 June 2021 in addition to one strategic project. Delays have been experienced with the commissioning of the two other projects due to the negotiation of agreements regarding confirmation of contributions from project participants and intellectual property management.

Internally, considerable effort has been expended on improving SmartCrete CRC's project development and approval process, with amendments made on the basis of learnings from the quality of the research proposals and the methodology for assessment. The assistance of Prof. Matthew Cuthbertson has been invaluable in applying his extensive experience in this area to making the process more efficient, robust and expedient.

## **ACHIEVEMENT OF COMMONWEALTH MILESTONES**

Due to the later commencement of research projects, the milestones due for completion in the 2020-2021 financial year are now scheduled for completion in the following financial year. We have regularly updated the Commonwealth on our progress and revised timelines and streamlined our project approval process which will also assist in achieving the Commonwealth milestones in the next reporting period.



Despite the challenging business conditions experienced during the financial year, SmartCrete CRC engaged proactively with potential partners

#### **EDUCATION AND TRAINING PROGRAM**

With the late commencement of funded projects, the projected Education and Training Program has been delayed. However, as described in the Education and Training section, SmartCrete CRC remains highly committed to developing the skills and capabilities of the Australian concrete research sector through a whole of life learning program with all students from Year 12 through to university undergraduates and postgraduates, as well as junior through to senior industry and academic workers. We appreciate this program is one of four enablers identified by industry partners to overcome bottle necks to innovation and will be a high focus for SmartCrete CRC to get momentum moving into the 2021-2022 financial year.

#### **SUMMARY**

There are no known material risks identified during this reporting period which have impacted our ability to achieve expected outcomes. We attribute this to our Risk Management Plan developed with the ARPF Committee which includes suitable mitigations.

# Research

## PROGRAM SUMMARY

SmartCrete CRC is the collaborative cooperation platform required for the facilitation and commercialisation of research for the concrete supply chain. It provides contacts, connections and funding for successful research projects to address the various issues and challenges for concrete, especially with its application in infrastructure.

It strongly generates focused, high-quality research programs for end use using collaborative partnerships, local and international best practice resources and exclusive industry pilot site access to address the current barriers to success.

## RESEARCH PROGRAM

The core themes of SmartCrete CRCs research programs were developed through a series of industry partner workshops that identified three industry problem areas. The program themes are as follows.

### Program 1 – Engineered Solutions (products and applications):

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New cementitious materials and construction methodologies to improve engineered structures. This program includes three themes:

1. New materials for improved durability
2. New construction and maintenance processes
3. Accelerated standards development.

The outcomes of the program will be the reduced cost of concrete and labour through improved formulations, construction methods, supply chain logistics, skills, capability and competition in procurement.

### Program 2 – Asset Management (predictive management)

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Improve whole of life concrete infrastructure. This program includes three themes:

1. Sensor solution modelling
2. New sensor system development
3. Lifetime predictive modelling.

The outcomes of the program will be improved whole of life asset durability, performance and use of real time data, and lower maintenance costs.

### Program 3 – Sustainability (alternative materials):

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Developing alternatives to raw materials at risk, reduce cement use by incorporating additives derived from domestic and industrial waste streams which account for and can reduce our carbon footprint. This program includes three themes:

1. Circular economy
2. Supply chain optimisation and quantification
3. Reduction of carbon footprint.

The outcomes of the program will be the improved business confidence in the supply chain, lower costs, viable repurposed materials from the waste stream and lower CO<sub>2</sub> emissions.

Each activity builds on existing research and involves laboratory development, field trials, demonstration sites and industrial production/use at specific partner sites. Subject matter experts will lead each program, theme and activity to maximise innovation, definitive outcomes and an industry leadership legacy.

Our integrated approach to proof of concept, commercial process development, industry capability enhancement and industry wide execution, offers a significant differentiator compared to current one-off local and international research studies.

**These activities are designed to deliver specific outcomes essential to meet SmartCrete CRCs overall objectives.**

**SmartCrete CRC is the only collaboration in Australia proposing a systematic approach to breakthrough concrete construction research from a whole of life cycle perspective.**



### CHANGE ENABLERS

Across all activities there are four change enablers identified by industry partners as critical to facilitate commercialisation of innovations. They are:

1. Accelerated standards: This involves accelerating the development of building codes, specifications and Australian Standards to allow the rapid uptake of new materials and methodologies and remove the bottlenecks to innovation.
2. Skills and training: This involves developing industry capability through skills, training, education and industry engagement.
3. Economic and risk modelling: This involves financial modelling of cost benefits and risk mitigation to drive industry take up of new innovations.
4. Implementation focus: This involves developing a mindset focused on implementation ensuring innovations move to the market place rather than stay in the laboratory.

A set of protocols and methodologies will be applied across all activities to ensure all developments are able to reach market with quantified economic and carbon footprint measures, the necessary building codes and standards in

place and an appropriately trained workforce ready to use them.

Direct outcomes will be:

- Improvements in costs, concrete durability and application
- Innovations reaching the marketplace
- Whole of life asset management
- Enhanced industry skills and capability, particularly sustainability
- A more responsive regulatory environment
- The development of a sustainable supply chain.

SmartCrete CRCs three program areas directly align to the Government's priorities; efficient delivery of infrastructure through product improvements and a sustainable supply chain, the repurposing of materials into the supply chain and reductions in CO<sub>2</sub> in concrete formulation.

SmartCrete CRC will also directly contribute to four of the Australian Government Science and Research priorities: resource optimisation, advanced manufacturing to address capacity constraints, transport/infrastructure through spatial analysis and environmental change through supply chain resilience and lower CO<sub>2</sub>.

**BIS Oxford's forecast suggests a realistic saving of \$600m through a 2% reduction in ash substitution, a 2% reduction in labour costs and a 10% reduction in aggregate costs as a result of Smartcrete CRCs programs.**

# Performance Against Activities

**Underpinning SmartCrete CRCs research programs is turnKey CRC, a software solution developed especially for CRCs to manage their portfolio of projects. SmartCrete CRC has customised and developed turnKey CRC to provide the level of information clarity and transparency, particularly with tracking our performance against activities, to ensure a continued cooperative and intellectual approach is taken between SmartCrete CRC and our partners.**

While we have made significant progress towards our objectives, SmartCrete CRCs performance against activities during the 2020-2021 financial period was not as expected due to a number of impediments (refer Risks and Impediments section on page 20). Our revised budget shows we will be on track to deliver our expected outcomes during the 2021-2022 financial period. As detailed in the following pages, three fast track projects and a strategic project are now in progress with a pipeline of research projects moving forward to approval.

In acknowledging SmartCrete CRCs performance, there were two areas which required improvement; the project development and approval process as well as the quality of proposals presented in order to make informed decisions.

We revised the project development and approval process to assist with delivering our activities more efficiently. Initially, the Research Committee would review the full project proposals before passing them through the Board for approval. This process was found to be time and resource consuming. A review was undertaken early in 2021, resulting in a more efficient approach by considering preliminary proposals prior to developing the full proposal submission. Subject matter experts are then drawn upon to provide commentary on the relevance and strength of these proposals before presenting to the Portfolio Strategy Group and Board. In taking this approach, we expect to see relevant research commissioned in a timely manner, allowing the full realisation of outcomes to happen more rapidly.

In reviewing the quality of project proposals, SmartCrete CRC has identified several areas where feedback and further training would be of benefit. This includes the description of commercial benefits and intellectual property management. SmartCrete CRC will generate opportunities for staff of partner organisations to upskill in these areas so that targeted opportunities can be identified and developed into funded proposals.

At our Festival of Ideas Workshop in September 2020, we demonstrated to the partners what is required to make a winning project proposal. This included clearly outlining the fundamentals required to meet contribution, industry investment and commercialisation outcomes. We have since included the criteria and guidelines as part of our information pack when partners come on board and additional effort has been put into coaching the project leads during the proposal process. As a result, we have seen the quality of proposals improve and expect to see more projects approved during the next financial period.



# Fast Track Projects

All fast track projects are driven by the needs of industry partners and the end users with whom they engage. The funding for these projects range from \$500,000 and \$1 million each.

In January 2021, three fast track projects were approved. The projects will run for up to three years and are spread across two of the three SmartCrete CRC research program themes; Asset Management and Sustainability. The fast track projects cover a range of areas, including research into the following:

## 1. WASTEWATER PIPELINE SENSING SYSTEM:

Innovative and economical photonic sensor interrogation

## 2. RECYCLED MATERIAL CONCRETE PRODUCTION:

Recycled waste in concrete for municipal applications

## 3. CONCRETE CORROSION TRACKING AND PREDICTION:

Cost-effective, deployable photonic sensor system

# Fast Track Project 1

## WASTEWATER PIPELINE SENSING SYSTEM (ASSET MANAGEMENT)

**DURATION:** 1 MAY 2021 TO 20 APRIL 2022  
**FUNDING:** \$508,300  
**PROJECT PARTNERS:** MACQUARIE UNIVERSITY, SYDNEY WATER CORPORATION  
AND MELBOURNE WATER CORPORATION

Failure of wastewater pipelines due to concrete corrosion is a global problem that custodians of this vital infrastructure face on a daily basis. Asset managers are currently unable to monitor concrete corrosion and its contributing factors over long periods of time using conventional sensing methodologies. Optical fibre-based sensing platforms however, have recently been shown to sustain performance in harsh sewer environments. Such systems though rely on costly interrogators which limits their use.

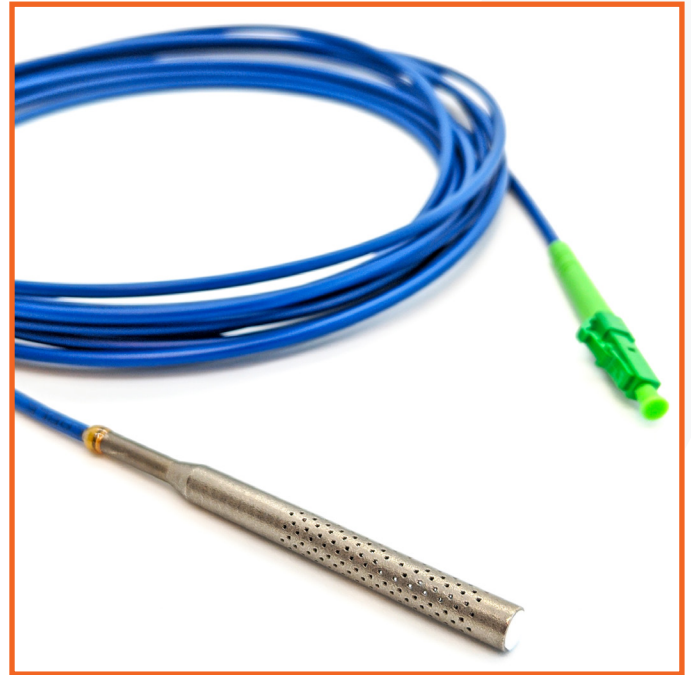
This project aims to develop a cost-effective, field deployable sensing system using optical components to deliver a time predictive capability to extend the life of sewer networks.

### **Project title: Innovative and economical photonic sensor interrogation**

The aim of this project is to establish an innovative predictive tool that will enable asset managers to monitor concrete corrosion, reduce maintenance costs and minimise physical pipe entry inspections. This will be achieved through the combination of round-the-clock monitoring using novel optical fibre sensing technology and a new predictive model derived from the rigorous analysis of concrete corrosion rates.

### **OUTCOMES AND BENEFITS:**

- People will enter sewers less often
- Enable real-time remote monitoring of wastewater pipes over long periods
- Reduce costs and provide longer asset life
- Enable improved predictive modelling.



**Image showing a Relative Humidity + Temperature sensor based on an optical fibre. The sensors are fabricated within the Optofab-ANFF Node at Macquarie University.**



**Industry Lead:**  
**Heriberto Bustamante**  
(Sydney Water Corporation)



**Project Lead:**  
**Dr Martin Ams**  
(Research Fellow,  
Macquarie University)



**Project Lead:**  
**Professor Michael Withford**  
(Macquarie University)

# Fast Track Project 2

## RECYCLED MATERIAL CONCRETE PRODUCTION (SUSTAINABILITY)

**DURATION:** 1 JULY 2021 TO 31 DECEMBER 2024

**FUNDING:** \$452,800

**PROJECT PARTNERS:** SUSTAINABILITY VICTORIA, DEPARTMENT OF TREASURY AND FINANCE (OFFICE OF PROJECTS VICTORIA) AND RMIT UNIVERSITY

This project will investigate and implement new applications of domestic and industrial waste materials (plastics, rubber, crusher dust and industrial by-products) in the concrete construction industry. It will provide long term environmental and economic benefits to key stakeholders: the supply chain, Government and asset owners.

The project is a strategic response to the demand-supply imbalance in the Victorian infrastructure and waste recovery sector with a primary focus on councils and local municipalities. The outcomes of this project have national application.

Concrete production in Victoria relies on aggregate and cement sourced from natural and finite sand and rock deposits. These deposits are declining in viability as there is a shortage of quarry materials and natural sands. Alternative sources of sands and aggregates are urgently required to meet forecasted consumption.

### **Project title: Recycled waste in concrete for municipal applications**

This project will develop a Green Star rating premix concrete using existing household material waste and commercial/industrial material as alternative aggregate in concrete. The project builds upon a recently developed premix concrete made with recycled plastic material as aggregate replacement for use in municipal concrete, such as pavements, bollards, culverts, etc.

The results will drive a step change in the reuse of core waste materials which will reduce disposal to landfill. It also presents a number of positive outcomes for all stakeholders when considering the volume of concrete infrastructure being developed and the current environmental trade-offs associated with concrete on emissions.



**Concrete cylinder from pavement with recycled plastic and rubber fines**

The aim of the project is to:

- Demonstrate through field trials that the premix delivery of concrete with recycled material content is suitable for municipal infrastructure application and to provide evidence of performance in terms of workability for ease of placement, mechanical properties for strength and durability in terms of abrasion resistance.
- Develop guidelines for contractors and performance requirements for premix delivery of concrete with recycled material content to meet Green Star ratings
- Investigate the continuous recycling capability of concrete with industrial and domestic waste to support a cradle to cradle circular economy, by reclaiming concrete with recycled materials and reprocessing as alternative aggregate.

*“We are proud to be funding a project that is the first to ‘turn the sod’ on practical research under the SmartCrete CRC brand and delivers value to both concrete infrastructure and the Australian community”.*

Dr Warren South, CEO, SmartCrete CRC

#### **OUTCOMES AND BENEFITS:**

- Develop a Green Star concrete mix/standard that incorporates solid municipal waste and commercial/ industrial material in concrete from a wide range of non-virgin and alternative materials
- Provide evidence of performance via site demonstration projects to encourage industry and end users to use recycled industrial and domestic waste materials in concrete for municipal construction application
- Support markets for the use of recovered materials through product development and specifications for delivery and placement of concrete with recycled material content
- Reduce the amount of municipal solid waste from commercial, industrial, construction and demolition sectors going to landfill for disposal
- Alleviate the natural resource depletion of our sand and rock deposits.



**Industry Lead:**  
**Julie Atkinson**  
(Office of Projects Victoria)



**Project Lead:**  
**Professor Rebecca Gravina**  
(Royal Melbourne Institute of Technology)

# Fast Track Project 3

## CONCRETE CORROSION TRACKING AND PREDICTION (ASSET MANAGEMENT)

DURATION: 1 MAY 2021 TO 30 APRIL 2023

FUNDING: \$1,229,000

PROJECT PARTNERS: SYDNEY WATER CORPORATION, MELBOURNE WATER CORPORATION, UNIVERSITY OF TECHNOLOGY SYDNEY (UTS), ANSTO, MACQUARIE UNIVERSITY AND LA TROBE UNIVERSITY (LTU)

Sewer pipe failure is a growing worldwide problem as wastewater systems age and come under increasing load. When sewer pipes fail, it is disruptive for the general public and comes with high financial, public health and environmental costs. Australia alone spends over \$1.4 billion annually on water and sewer pipe maintenance.

The project will develop long-lived (> 10 years) 'smart coupons', that once installed, will emulate the physical and chemical conditions in the surrounding concrete wastewater pipes. 'Smart coupons' will track concrete corrosion, predict end-of-service time frames and improve operation practices to reduce rehabilitation costs of wastewater concrete assets.

### Project title: Cost-effective, deployable photonic sensor system

Sydney Water, Melbourne Water, ANSTO and Macquarie University are in the final stages of a four-year research study investigating the physical and chemical changes that occur inside concrete during corrosion associated with sulphuric acid attack, as well as developing fit-for-purpose sensors which can detect factors that contribute to concrete corrosion, such as humidity (in conjunction with H<sub>2</sub>S), temperature and pH. This study also developed strain sensors that can detect the physical onset of corrosion. Optical fibre sensor technology was used throughout because this platform can survive many years inside a wastewater system with minimal operational overheads once installed.

This project will focus on translating the learnings of the previous research study into a field deployable, integrated 'smart coupon' that can be readily deployed by trained technicians. The 'smart coupons' will be calibrated and subjected to quality control testing in a controlled laboratory environment, therefore mitigating sensor data variability which would otherwise manifest if field technicians were tasked to install optical fibre sensors in-situ.

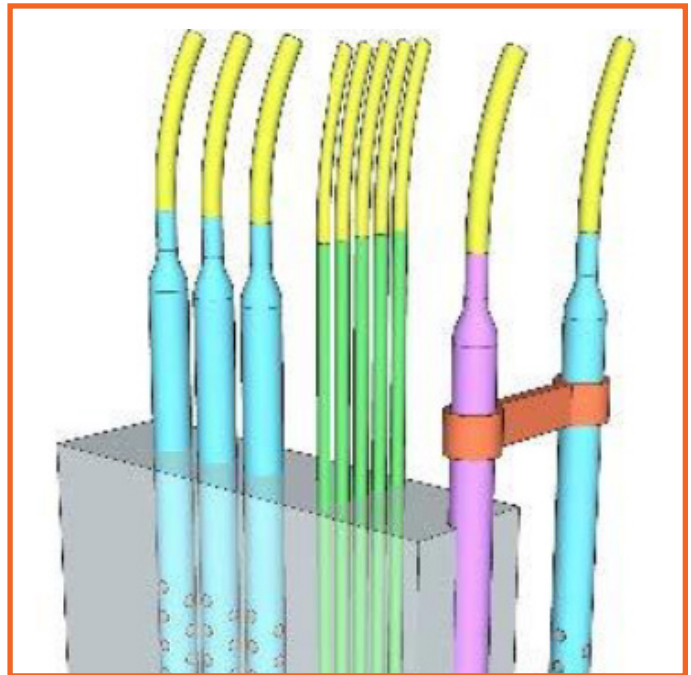


Figure 1: Conceptual image of a smart coupon with embedded strain sensors (green), temperature sensors and relative humidity sensors.

**Outcomes and benefits:**

- A system for measuring concrete corrosion rates and predicting sewer failure
- Reduce the cost of sewer maintenance leading to lower water charges for Australian households
- Less inconvenience and problem odours from sewer degradation.

**Outcomes and benefits for industry:**

- Development of a laboratory prototype 'smart coupon' that senses temperature, strain and relative humidity
- Demonstrate production volume scalability for producing a set of 'smart coupons' which meet defined performance specifications.
- Provide design and specification tables
- Generation of field data
- Development of dewpoint models
- Provision of field-based case studies for reporting performance of the 'smart coupons'
- A Training Module that will enable a field technician/contractor to practically install the 'smart coupon' system.



**Industry Lead:**  
**Dr Heriberto Bustamante**  
(Sydney Water Corporation)



**Project Lead:**  
**Professor Paul Pigram**  
(LaTrobe University)



**Project Lead:**  
**Dr Martin Ams**  
(Research Fellow,  
Macquarie University)



**Project Lead:**  
**Professor Michael Withford**  
(Macquarie University)

**Project Lead: Dr Thomas Kuen**  
(Melbourne Water Corporation)

# Strategic Projects

SmartCrete CRC employs strategic projects of a short term nature to take advantage of opportunities that enable the development of solutions to industry issues which are foreseen as generic in nature but will further the achievement of SmartCrete CRCs vision. The funding for these projects is up to \$500k.

## DECARBONISATION PATHWAY FOR THE AUSTRALIAN CEMENT AND CONCRETE SECTOR (SUSTAINABILITY)

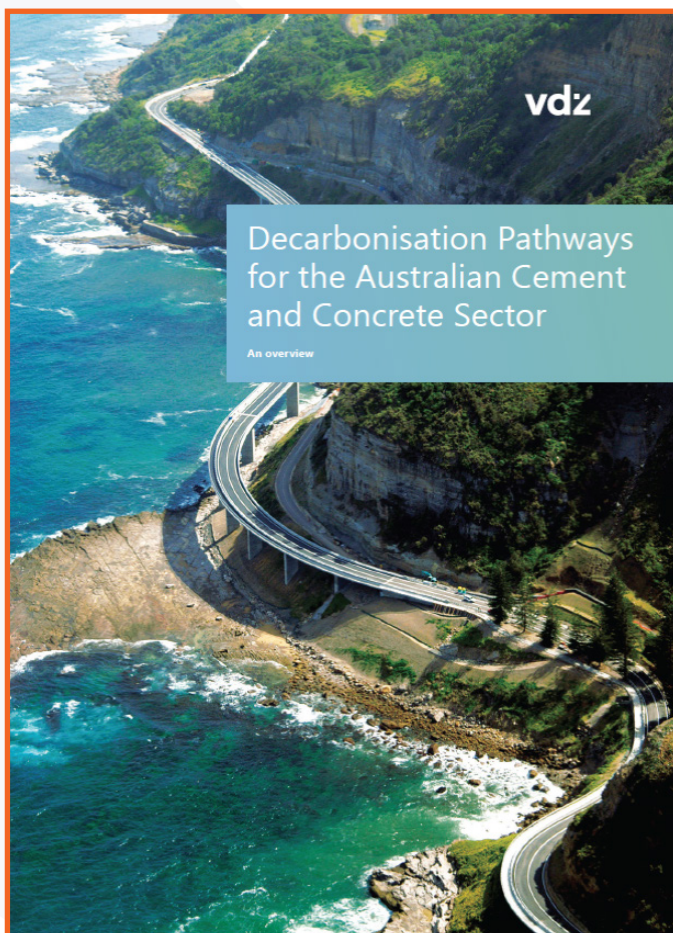
**DURATION: 9 APRIL 2021 TO 31 JULY 2021**

**FUNDING: \$210,000**

**PROJECT PARTNERS: CEMENT INDUSTRY FEDERATION (CIF), RACE FOR 2030 CRC AND VDZ**

At the beginning of 2021 the construction of an industry-supported pathway to a lower emissions-intensive future was developed in consultation with industry organisations. The industry-supported decarbonisation pathway allows the Australian cement and concrete industry to evaluate and indicate the research and policy changes required, as well as provide a platform to measure reductions that may be derived from the commercialisation of these technologies.

SmartCrete CRC, CIF and RACE for 2030 CRC have collaborated with VDZ, the joint organisation of the German cement industry and a globally recognised research centre for cement and concrete, to develop a roadmap with the aim to identify decarbonisation pathways for the Australian cement and concrete sector.



The purpose of this project is to develop a decarbonisation pathway which has strong stakeholder endorsement, both within the Australian cement and concrete sector and the wider community, that accelerates adoption of emission reduction pathways.

The pathway will outline a cement and concrete decarbonisation technology pathway, using a life cycle analysis approach which has strong stakeholder endorsement. This will inform the acceleration and adoption of emission reduction pathways. It will also evaluate current and emerging domestic and international technologies that could be adopted to accelerate the decarbonisation of the Australian cement and concrete sector and assess demand-pull strategies, including Government procurement policies and related standards which could be used to increase adoption rates of lower carbon cement and concrete in Australia.

This project has become the model for funding further strategic opportunities opportunities.

*“SmartCrete CRC sees this as a major opportunity to provide collaborative opportunities for our partners while partnering with other CRCs to develop industry research hubs which will only benefit the future of research. At the same time, we will have a good indication of the viability of research projects submitted to SmartCrete CRC in terms of reaching their intended outcomes.”*

Dr Warren South, CEO, SmartCrete CRC



**Project Lead:**  
**Margaret Thomson**  
(Cement Industry Federation)



**Research Lead:**  
**Martin Schneider**  
(VDZ – Association of German  
Cement Works)



# Pipeline Projects

SmartCrete CRCs Board Meeting held on 17 June 2021 conditionally endorsed eight projects that will run for up to four years and involve industry partners with support by our research providers. These projects represent a cash investment of almost \$5.2 million of Commonwealth funds by the CRC and partner contributions.

At year end, SmartCrete CRC employees were fully immersed in working with our partners to realise these projects and clearing the conditions stated from SmartCrete CRCs Board. From here, a Project Plan will then be developed which is an integral step in settling Project Agreements with all parties.

It is expected that these projects will be commenced in the second quarter of the 2021-2022 financial year.

#### PROJECT PARTNERS:

- ASH DEVELOPMENT ASSOCIATION OF AUSTRALIA (ADAA)
- AUSTRALASIAN SLAG ASSOCIATION
- AUSTRALASIAN POZZOLAN ASSOCIATION
- UNIVERSITY OF SYDNEY
- UNIVERSITY OF TECHNOLOGY SYDNEY
- MACQUARIE UNIVERSITY
- PAINTBACK
- HAWKS EXCAVATION (VIC) PTY LTD
- STRETFORD CIVIL CONSTRUCTIONS PTY LTD
- TRANSPORT FOR NSW
- ROYAL MELBOURNE INSTITUTE OF TECHNOLOGY
- UNIVERSITY OF NEWCASTLE
- HOLCIM (AUSTRALIA) PTY LTD
- CURTIN UNIVERSITY
- AUSTRALIAN ENGINEERED FASTENERS AND ANCHORS COUNCIL
- SWINBURNE UNIVERSITY OF TECHNOLOGY

*"This is an exciting step in the development of industry led solutions for Australian concrete infrastructure."*

Dr Warren South, CEO, SmartCrete CRC

#### SUSTAINABLE AND FIT-FOR-PURPOSE CONCRETE MATERIALS FOR CONSTRUCTION OF ASSETS (ENGINEERED SOLUTIONS)

**Project Lead:** Professor Marjorie Valix, University of Sydney  
**Industry Lead:** Ms Lourdes Valle, BHP Group Operations Pty Ltd

The aim of this project is to bring together stakeholders from researchers, recyclers, cement manufacturers to end users, to create the value chain for durable and high performing specialty concrete and speciality concrete with repurposed wastes (e.g. glass, mine wastes) in the construction and rehabilitation of non-structural (e.g. road curb) and structural civil assets including pavements, manholes and culverts. The project will support the economic, social, environmental and commercial aspirations of the stakeholders and most importantly, provide a legacy framework by which future innovation (e.g. new concrete) and wastes will be assessed in a timely manner for potential commercial adaptation in construction.

#### USE OF RETURNED CONCRETE AGGREGATE AS REPLACEMENT OF VIRGIN AGGREGATE (SUSTAINABILITY)

**Project Lead:** A/Professor Prabir Sarker, Curtin University  
**Industry Lead:** Dr Vinod Rajayogan, Holcim (Australia) Pty Ltd

Returned concrete waste is a common issue actively managed by pre-mixed concrete companies. However, up to 288,000 tonnes of returned concrete is sent to dumping pits in Australia annually which poses a risk of harmful leaching to the groundwater. Management of the waste is becoming more challenging with the scarcity of dumping sites and likely changes to legislation. This project will study the effects of using crushed hardened returned concrete aggregate on concrete properties. The results will benefit the ready-mix companies to use returned concrete aggregate as a replacement of virgin aggregates. This will enable a safe and economical re-use of concrete waste in a sustainable way.

### DEVELOPMENT OF ECO-FRIENDLY CONCRETE USING INDUSTRIAL BY-PRODUCTS (ENGINEERED SOLUTIONS)

**Project Lead:** A/Professor Patrick Tang, University of Newcastle  
**Industry Lead:** Mr Adam Kelly, Daracrete Pty Ltd

Coal bottom ash is one of the biggest sources of industrial wastes which is produced from coal-fired power plants. Its toxicity combined with large production rates poses serious worldwide environmental problems. This project aims to develop an eco-friendly concrete using coal bottom ash as an alternative to cement and fine aggregates. Outcomes include establishing standard guidelines for refining the coal bottom ash and its use in concrete for structural applications. Using coal bottom ash in concrete proposes an economic and ecological way of its disposal, as well as conserves natural resources and promotes sustainability.

### DEVELOPMENT OF DESIGN GUIDES FOR ADVANCED FASTENINGS INTO INNOVATIVE CONCRETE PRODUCTS (ENGINEERED SOLUTIONS)

**Project Lead:** Professor Emad Gad, Swinburne University of Technology  
**Industry Lead:** Mr Andreas Boomkamp, Australian Engineered Fasteners and Anchors Council (AEFAC)

Fasteners are essential to connect structural and non-structural components in buildings and infrastructure. This project aims to extend the scope of the newly published Australian standard for fastenings into concrete (AS5216) to include provisions that support innovation in construction materials, infrastructure and building technologies. Some of these provisions include developing assessment methods and design approaches for fastening in innovative concrete and under seismic actions. The outcomes from this project are intended to be incorporated in the next revision of AS5216 to benefit the construction industry by supporting innovation in concrete fastening technologies as well as ensuring safe and efficient designs.

### SUSTAINABLE LOW CARBON CONCRETE FOR FUTURE CONCRETE INFRASTRUCTURE (ENGINEERED SOLUTIONS)

**Project Lead:** A/Professor Rebecca Gravina, Royal Melbourne Institute of Technology  
**Industry Lead:** Yet to be determined

This project aims to develop a solution to re-qualify waste materials and generate a valuable resource material for the concrete construction industry which provides long term environmental and economic benefits. The project is a national partnership between road authorities and academia across Australia, including mineral resource organisations, to provide evidence and support which encourages the industry and end-users to take up the use of recycled waste materials in concrete for infrastructure applications. It will provide low carbon concrete using viable sustainable alternative materials from recycling for adoption in roads and non-structural applications.

### GROUND IMPROVEMENT USING RECYCLED CONCRETE AGGREGATES AS SEMI-RIGID INCLUSION COLUMNS (SUSTAINABILITY)

**Project Lead:** Dr Farshid Maghool, Swinburne University of Technology  
**Industry Lead:** Mr Ahmad Fard, Hawks Excavation (VIC) Pty Ltd

Nine million tonnes of demolition concrete is produced in Australia annually. Ground inclusions, such as those used with stone columns, are typically used to improve the load-bearing capacity, stiffness and stability of in-situ soils. This project will evaluate the use of recycled concrete aggregates as an alternative material to quarried aggregates in ground inclusions. In addition to unbound recycled concrete aggregates, a novel binder will be developed with the use of geopolymers for lightly-bound semi-rigid ground inclusion columns. The project will involve extensive laboratory testing and the development of prototype laboratory equipment to evaluate the performance of recycled concrete aggregates as an alternative aggregate in ground inclusions for ground improvement projects.

### LOW CARBON FOOTPRINT SUPPLEMENTARY CEMENTITIOUS MATERIALS FOR CONCRETE AND BLENDED CEMENT USE FROM MINERAL CARBONATION (SUSTAINABILITY)

**Project Lead:** Dr Kirk Vessalas, University of Technology Sydney

**Industry Lead:** Dr Mark Rayson, Mineral Carbonation International Pty Limited (MCI)

Mineral carbonation is a new technology that converts CO<sub>2</sub> to useful solid materials by reacting it with magnesium or calcium silicate rocks. Amorphous silica is produced as a by-product of the process. This project seeks to assess the suitability using the amorphous silica as a supplementary cementitious material addition in concrete and cement. The products developed will have the potential to reduce costs and the CO<sub>2</sub> footprint of cement and concrete as well as improve both cement and concrete performance.

### POLYMER MODIFIED CONCRETE FROM RECYCLED WASTE LATEX PAINT (SUSTAINABILITY)

**Project Lead:** Dr Shima Taheri, Macquarie University

**Industry Lead:** Dr Salwan Al-Assafi, Paintback Limited

Paintback, an Australian product stewardship body, collects ~4,000 tonnes of waste latex paint per year to divert the waste paint from landfill. Paintback aims to create beneficial use of the waste paint in concrete products as some paint ingredients (such as latex, pigments and surface active agents) can potentially improve the mechanical and durability properties of concrete. This project aims at incorporating water-based paint in low risk concrete applications (such as pavement and parking decks) and investigate its impact on the concrete properties through full-scale laboratory and field studies. The outcome will provide guidelines on the maximum allowable amount of recycled paint in concrete, together with recommendations on using the recycled paint in suitable applications.



**Dropping off unwanted paint and packaging to Paintback**

*Photo credit: Paintback*

A photograph of three construction workers on a site. They are wearing hard hats (one white, two yellow) and high-visibility safety vests (one red, two yellow). They are gathered around a tablet computer, looking at the screen. The background shows a concrete structure under construction with many vertical rebar rods protruding. The image is partially framed by a large orange circular graphic on the left side.

SmartCrete CRC will leave a legacy of a better, balanced and skilled workforce for the concrete, construction, asset management and recycling industries.

# Education & Training

Education and training are a core component of the SmartCrete CRC Program. Without appropriately skilled and trained people at all levels of the construction industry, we will not be able to deliver the sustainable future envisioned by the CRC Program. A major legacy of the CRC Program will be a talent stream feeding into all levels of the construction sector including asset owners and R&D institutes. Under the leadership of the Research Director, a whole of life learning program encompassing students from Year 12 through to university undergraduates and postgraduates, as well as junior through to senior industry and academic workers is planned. Our focus is to construct a community of students enabling interchange of research and ideas, as well as coordinating the educational requirements of funded projects to achieve tangible commercial outcomes.

SmartCrete CRCs Education and Training Program includes:

- **Industry focused graduate and postgraduate development:**  
Our university partners are perfectly placed to train the next generation of leaders in the concrete industry who will benefit from the degree programs already in place in our partner institutions. Students will be engaged in SmartCrete CRCs Program through a comprehensive industry placement scheme. Undergraduate and Master students will be placed through existing schemes at partner universities, such as the Professional and Community Engagement (PACE) Scheme at Macquarie University. All PhD students engaged in our program will spend six months with an industry partner. These placements will ensure all of our students gain exposure to the research, development, production and delivery of SmartCrete CRCs objectives which not only align with Government priorities but provide skills and develop capabilities that are fundamental to market success.
- **Whole of life industry learning:** It is important workers in the industry are brought up to speed with SmartCrete CRCs developments to allow step change implementation. We plan to hold an extensive series of seminars between industry and academia as well as an industry-academia exchange program where

partners can spend three to six months embedded in a suitable university or company. Both of these activities will provide cross fertilisation and improve general communication throughout SmartCrete CRC. We will also work with university partners and TAFE to develop sets of micro-credentials, delivered both online and face to face, to allow industry partners to incrementally upskill as the program develops.

- **Contractor specific training:** It is essential that training for new skills required by contractors to implement the innovations generated by SmartCrete CRC is provided in a timely manner. We are working with TAFE and industry associations (such as ARRB and CCAA) to develop a set of courses specific for contractors before new products and methodologies become available to the marketplace. These courses will result in industry recognised qualifications.

Of importance, most of our university partners are members of Science in Australia Gender Equality and have, or are seeking, the Athena SWAN Bronze Award. In a similar vein SmartCrete CRC aims to encourage similar practices in the concrete industry. SmartCrete CRC will follow the Charter principles by actively engaging the recruitment of female researchers, supporting their career development, minimising short term contracts and encouraging flexible work practices.

Our Education and Training Program will provide and promote qualifications which the broader construction industry and other markets will benefit from through developing workforce capacity and industry capability, particularly in higher-value sectors of the industry which are expected to grow disproportionately. This will help equip the workforce to deploy new technologies and jobs and improve Australia's ability to increase the quality and performance of its concrete infrastructure.

SmartCrete CRC will leave a legacy of a better, balanced and skilled workforce for the concrete, construction, asset management and recycling industries.

# Intellectual Property (IP) Management & Commercialisation

**SmartCrete CRC appreciates the importance of IP management and protection which is why a Term Sheet has been in place from the beginning. The Term Sheet outlines the agreed principles associated with IP management and protection for the CRC. This ensures there are no disputes between partners and IP is adequately protected as it is generated. SmartCrete CRC owns the IP as a default position (to ensure that there is a truly public benefit gained from the whole CRC) with alternative arrangements agreed upon in project agreements. SmartCrete CRCs Commercialisation Manager is responsible for managing and delivering these objectives.**

SmartCrete CRCs partners embrace the notion that the Program's R&D will extend outside the typical university environment into specific partner or research sites for initial development, trials and demonstration sites and are committed to providing access to infrastructure and technology.

Many academic and industry partners already hold IP portfolios which will be drawn upon. The principles of access to these are set out in the Term Sheet.

Furthermore, SmartCrete CRC has developed its IP operating principles consistent with the principles of the National Principles of Intellectual Property Management for Publicly Funded Research as follows.

**Focus:** As an enabler of research and as a facilitator of networking/collaboration in pursuit of its objects, SmartCrete CRC seeks to disseminate, through its partners and other stakeholders, knowledge and understanding generated through research endeavours within the concrete ecosystem. Central to this is the active encouragement of industry and research sector collaborations under well-defined project plans.

**Fairness:** SmartCrete CRC supports access to IP based on agreed, fair and equitable terms, in a timely manner.

**Project IP ownership:** Consistent with SmartCrete CRCs facilitative and leadership role, we will seek, in the first instance, to own IP arising from funded projects (excluding background and student IP) unless there are sound project reasons in line with SmartCrete CRCs or the projects participant's objectives.

**Project IP access:** Access to project IP will be negotiated with project parties based on rigorously developed project plans agreed in advance. Access arrangements may vary according to range of use, territories and markets appropriate for each project and anticipated project outcomes.

**Background IP:** IP contributed to a project will remain owned by the contributor. If background IP is required for the purpose of project IP ownership and access arrangements, the project terms will set out the scope of the required access (i.e. licensing).

**Applying commercial returns:** SmartCrete CRC will apply any commercial returns arising from projects to further the CRCs objectives. For example, to further research for the benefit of the concrete ecosystem.

**IP management:** Each SmartCrete CRC project will be required to proceed according to sound project management principles under a nominated project leadership team.

**Student IP:** A student's thesis project will be described in a separate schedule within the relevant Project Agreement and each student will need to sign a separate IP Agreement.

While commercialisation has not been realised in these early stages of SmartCrete CRCs start-up, commercialisation potential has always been a key objective for SmartCrete CRC, particularly as most academic research initiatives fail to make it to the commercialisation stage. SmartCrete CRCs commercial potential looks at next generation concrete production and construction technologies, new products and services, and smarter solutions which extend outside the typical university environment into specific partner sites (e.g. pipe and production) or research sites (e.g. 3D printing and mechanical testing) for initial development and trials, complemented by the establishment of demonstration sites.

SmartCrete CRC will assist in identifying new market opportunities by supporting existing companies that

have struggled with significant improvement in the industry and are under immense strain from substitute ceramic, metal and steel-based products and growing competition from imports. We will explore establishing new company opportunities or ventures, particularly with innovations, in the broader construction industry and other markets nationally and internationally. We will work with our partners to determine the optimum pathways to deliver these opportunities using application-specific insights developed through the program, and licensing and royalty payments from new concrete technology patents expected from the innovation disclosures. SmartCrete CRCs industry partners will in-turn have the benefits shared back through new products and services, such as infrastructure condition monitoring services.

Our path to market will consider costs, labour and supply chain aspects managed through SmartCrete CRCs Partner & Stakeholder Committee and Research Committee and cover performance, attainment of Australian Standards and education and training needs.

# Cyber Security

SmartCrete CRC is conscious of cyber security and ensuring information is handled safely, particularly as this is important to the Commonwealth and has been one of the prime topics addressed through the establishment of the CRC.

SmartCrete CRC has based its information architecture on the guidance provided by the Cyber Security Guidelines within the Australian Government Information Security Manual provided by the Australian Cyber Security Centre (ACSC). The ACSC leads the Government's efforts in cyber security and is part of the Australian Signals Directorate. SmartCrete CRC plans to become a partner organisation of ACSC in the 2021-2022 financial year.

The requirements of the Privacy Act 1988 and additional measures that similarly aim to foster transparent information and data handling practices and accountability have been implemented.

Security layers include:

- Local network firewall and threat detection
- 'Cloud' security such as external spam filtering
- Privileged user access restrictions
- Web content and security filtering
- External DNS filtering
- Anti virus and anti malware
- Complete management of patching
- Management of data encryption
- Multi factor authentication for all logins
- User security awareness training
- External backup and disaster recovery of all data

All SmartCrete CRC data is stored on SharePoint or OneDrive or in Exchange online 365. To ensure business continuity in a cyber security event, SmartCrete CRC has implemented hourly backups in a secure third-party location. The formulation and implementation of comprehensive plans for Disaster Recovery and Business Continuity have been prioritised by the CRC.



# Partner Engagement

Since inception, SmartCrete CRC has had a solid commitment from university partners. To support the CRCs objective for industry-led projects, we have placed significant emphasis to attract additional key industry partners. Towards the end of the financial year, SmartCrete CRC recruited two staff members from the concrete industry to support this objective by:

- Developing capability and drive industry participation into the CRC
- Advocate academic partner capability to industry
- Increase industry cash contribution to ensure engagement and return to academic partners.

This strategy has seen the number of partners grown to 46 in total, with 21 of those from the industry sector.

Concurrent with the recruitment of core partners is the identification of major industry issues. These are used to both facilitate interaction with Government and academic partners, as well as inform SmartCrete CRCs research portfolio.

Our ambition is to grow the number of partners, specifically at the core and supporting partner level, to at least equal or exceed the targets outlines in the Commonwealth Grant Agreement. We expect in the next few months to partner with major industry players to strengthen our industry connections and increase the value of research to the whole concrete supply chain.

The following details some of the strategies SmartCrete CRC has undertaken to date to achieve our objectives.

## FESTIVAL OF IDEAS WORKSHOP

The inaugural Festival of Ideas Workshop was held on 10 September 2020 and hosted by the Venture Café Sydney. The festival was designed for partners to present the challenges they would like SmartCrete CRC to address and for SmartCrete CRC to demonstrate what makes a winning project proposal. The event also provided opportunities for networking with the presenters and road-testing industry member's research ideas. Registrations totalled 130 from industry and universities, with approximately 100 in attendance for the entire session.

The event commenced with an opening address by Stephen Harmer (Interim CEO at the time) who also acknowledged the imminent start of newly appointed CEO, Warren South. Industry insights were presented by Margaret Thomson (Cement Industry Federation) and Christian Christodolou (Transport for NSW). The talks concluded with a presentation by John Vazey (EngAnalysis) on what a winning project proposal should look like.

The workshop then enabled the attendees to meet the speakers and employees of SmartCrete CRC via a robust session of discussions at the numerous virtual breakout tables.

## WEBSITE AND SOCIAL MEDIA

With a lot of hard work, SmartCrete CRCs website was up and running in May 2019 to develop a communication channel with our target partner market and to elaborate our development process. The website also created a pathway for the submission of project ideas and proposals to SmartCrete CRC.

Our social media communications have been managed through LinkedIn to ensure connection with our target audience.

Recent inclusions in social media and SmartCrete CRCs website include monthly partner profiles designed to showcase some of our key partner personalities from both the academic and industry sector, beginning with our core partners. This initiative provides a marketing opportunity for each partner as a result of their contributions, while providing a platform to celebrate the depth of partners the CRC has and to encourage further partner investment. This has proven popular and enthusiastically received from our partners interviewed so far.

## SYDNEY AND MELBOURNE WORKSHOPS

In SmartCrete CRCs development phase, a series of workshops were held in Sydney during April 2019 at Macquarie University's CBD campus and in Melbourne at the Royal Melbourne Institute of Technology campus to bring together leading representatives from asset owners, industry, supply chain and the academic world. This was to focus on projects that reduce the cost of concrete, improve its application, improve asset management and provide a sustainable solution to the supply chain.

Facilitated by Lara Moroko (Fisher Folk), the workshops proved to be a stimulating experience and generated 23 specific projects across the three theme areas of Engineered Solutions, Asset Management and Sustainability. These project areas became the foundations of the research focus and the establishment of the target milestones with the Government.



# Communications

**SmartCrete CRC established a web presence early in the bid process as a communication channel with our target partner market and to elaborate our development process. Since then, it has created a pathway for the submission of project ideas and proposals to SmartCrete CRC and is being used to develop layered collateral for multi channel/audience distribution, from public relations (public facing) to detailed technical case studies, including the provision for video content. To foster our web presence, SmartCrete CRC plans to provide co-branded content for partner channel distribution.**

During 2021, SmartCrete CRC is developing a Marketing and Communications Plan to set out objectives for the marketing campaign to highlight SmartCrete CRCs activities. The objectives include:

- Validate Commonwealth milestones through specific project outcomes to the Government in response to the \$21 million investment over the seven years
- Help generate and exceed the \$21 million Government grand funding with matched industry funding
- Position SmartCrete CRC as a highly successful CRC with visible industry-led and community value add outcomes over seven years
- Reinforce the value of CRCs to a higher technology readiness level delivery
- Position SmartCrete CRC as thought leaders in concrete innovation
- Promote and commercialise the outcomes of the research programs via IP to deliver favourable returns on investment to member organisations and generate a fourth round of research beyond the seven years
- To build a strong network of industry, government agencies, higher education institutions and professional organisations to drive research focus and outcomes over the seven years for future concrete research initiatives (ie. create a legacy).

After an indepth review of the customer relationship management (CRM) platforms available, SmartCrete CRC considered the SalesForce platform as an economical tool for our contacts database. Regular communications are

sent to contacts in Salesforce at a frequency set out by the Marketing and Communication Plan through email and our LinkedIn social media page. By using Salesforce, all our communications (e.g. Hubspot/Mailchimp/Campaign Monitor etc.) have been integrated into a single communications platform.

During the year, a branding refresh was undertaken to signal the transition of the organisation from the bid phase to the establishment stage. As a result, a simpler, bolder logo was developed as well as a style guide to support the logo's implementation.

## **NEW HEAD OFFICE**

After commencing in temporary accommodation at Macquarie University, SmartCrete CRC secured office accommodation at 3 Innovation Road, Macquarie Park. On 9 November 2020, the office space was refurbished and reconfigured to suit our needs. The layout has been designed to encourage collaborative shared experiences for our partner organisations. The office will be part of a future CRC Hub at Macquarie University, who are using SmartCrete CRC as a prototype for further endeavours in CRCs.

**Position SmartCrete CRC as a highly successful CRC with visible industry-led and community value-add outcomes over seven years**

# Governance

SmartCrete CRC is an incorporated company, limited by guarantee. The governance model is based on the principles and recommendations of the CRC Program.

SmartCrete CRC will:

- Provide an opportunity for SMEs to participate in, and nominate, research projects
- Promote networking, training and knowledge transfer opportunities amongst SMEs.

SmartCrete CRC will provide an opportunity to partner with other segments of the industry and research community to improve the delivery of breakthrough advancements in the cement and concrete product market.

## CORPORATE STRUCTURE

The following diagram outlines our corporate structure as at 30 June 2021:



# Board

**In April 2020, an Interim Board was appointed and provided sterling work in guiding the organisation from the bid phase to establishment stage.**

At the inaugural Annual General Meeting held in November 2020, the Interim Board was retired as a strong and independent Board of Directors was appointed. The Board was recruited based on their skills and knowledge of the concrete and construction sector and their experience in governance, finance, audit, risk management, research adoption, commercialisation, education and training, with the diversity of the team also a key consideration. The Directors have a wide range of skills and experience which will serve to develop SmartCrete CRC into a strong functional structure.

The Interim Board engaged the assistance of an independent recruitment firm to assist with the nominations process and a high quality field of applicants were shortlisted, interviewed and reference checked for the five independent Director positions.

At the inaugural Annual General Meeting, Em Prof Elizabeth Taylor AO was also appointed as independent Chairperson for a two-year term and Mr Stephen Harmer was appointed as an independent Director for a three-year term.

The Board is supported by the following committees which were established at the first Board meeting:

- Research\*
- IP and Commercialisation Committee\*
- Culture and People
- Partner and Stakeholder
- Audit, Risk, Privacy and Finance.

\*The Board agreed to merge the Research Committee with the IP and Commercialisation Committee in June 2021. The Investment and Impact Committee was formally approved on 4 August 2021.



**Name: Em Professor Elizabeth Taylor AO**

**Title:** Director

**Qualifications:** Em Professor, Hon.DEng (UNSW) BE LLB(Hons), HonFIEAust FTSE FAICD

**Experience and expertise:** Elizabeth Taylor specialises in governance effectiveness and ecosystem analysis.

Following a career in industry as a design and construction engineer, Elizabeth moved into academe, finishing her academic career as Pro Vice-Chancellor and Executive Dean, Faculty of Sciences, Engineering and Health, CQUniversity. Since 2013 she has undertaken numerous independent assurance reviews and smart buyer analysis of complex engineering projects.

Over her career Elizabeth has built extensive Board-level leadership in professional organisations and innovative technology entities. Currently she is Chair of SmartCrete Cooperative Research Centre and Chair, Washington Accord, and Deputy Chair, Governing Group, of the International Engineering Alliance, a suite of international agreements governing the recognition of engineering educational qualifications and professional competence.

Elizabeth has always engaged in diverse pro-bono work. Currently she is Chair of the Cambodian Children's Trust Australia. She recently retired as Chair of RedR Australia, an humanitarian response agency, standby partner to 14 UN agencies and manager of Australia Assists, the Australian Government's humanitarian civilian deployment program, She was Chair of RedR International until May 2021. She is recognised as one of Australia's 100 most influential engineers.

**Special responsibilities:**

Board Chair

Member of Culture and People Committee



**Name: Dr Gunilla Burrowes**

**Title:** Director

**Qualifications:** FTSE HonFIEAust GAICD

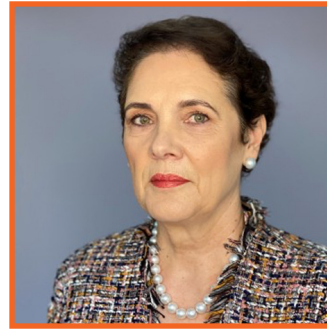
**Experience and expertise:** An electrical engineer with a broad range of industry and academic experience, Gunilla is passionate about innovation, entrepreneurship, technology commercialisation and improving diversity and inclusion in the workplace.

In 2000, she founded an underwater tech company, BlueZone Group with her husband which now has two offices in Newcastle and Perth. Gunilla is also co-founder of a consultancy, Gender Matters that advises organisations on gender equity and has a unique approach to mitigating cognitive bias in decision-making.

Gunilla is the inaugural Chair of Eighteen04 (an inspirational co-working and incubator space for companies scaling in the clean tech and smart city area) and inaugural board member of Hunter iF project (an open consortium of leading organisations in the Hunter that supports the growing startup ecosystem in the region). She is a member of the Hunter Angels and has been an Angel Investor for over 10 years. Gunilla has graduated from the AICD Directors Course and is on numerous company boards including the Blue Economy CRC. She has been a National Vice President of Engineers Australia, awarded an Honorary Fellow of Engineers Australia in 2017 and invited as a Fellow of the Australian Academy of Technology and Engineering in 2019.

**Special responsibilities:**

Chair of Culture and People Committee  
Member of Investment and Impact Committee  
Member of the former Research Committee  
Member of the former IP & Commercialisation Committee



**Name: Catherine Ferrari**

**Title:** Director

**Qualifications:** B.Bus, MLM, FCPA, GAICD

**Experience and expertise:** Catherine has had an extensive career holding a range of senior executive roles as well as non-executive director roles. Most recently Catherine was the General Manager Customer and Community at the Water Corporation. Previous roles include CEO of the West Australian Symphony Orchestra and State Director of CPA Australia (Western Australia). Catherine is the Deputy Chair of the West Australian Opera, a Trustee of the Legal Contribution Trust, and a Director of Racing and Wagering Western Australia.

As an experienced senior management professional Catherine has a record of developing and growing organisational culture and vision and has extensive experience in the effective development and implementation of strategy, planning, policy, budgeting, reporting, marketing, advertising and all aspects of customer and public relations.

With 20+ years' experience of Board roles, in a diverse range of sectors and industries, and also of working with boards at senior executive level Catherine is well versed in governance principles and has experience in high level board decision making and advisory input.

**Special responsibilities:**

Chair of Partner and Stakeholder Committee  
Member of Audit Risk Privacy & Finance (ARPF) Committee  
Member of Culture and People Committee



**Name:** Stephen Harmer

**Title:** Director

**Qualifications:** BComm (Marketing), GAICD

**Experience and expertise:** Stephen brings over 40 years' experience in general management, strategy development, business development and marketing of fast-moving consumer goods, industrial, B2B and services markets and, significant supply chain and procurement network relationships across the construction and infrastructure sectors including directly applicable experience in the concrete market as Group Marketing Manager with CRS Readymix.

Stephen is the Director of Insight Business Strategy Advisory (InsightBSA) specialising in business strategy advisory and governance services to the corporate and government sectors, which creates value for clients through the delivery of sustainable strategies, achievable execution plans, leadership mentoring and governance.

Current Governance experience includes Not For Profit roles as a Board member / Treasurer/ Chair Finance, Risk and Audit Committee Sydney Drug Education & Counselling Centre (SDECC) which specialises in providing counselling and support for young people aged 12 -25 with problematic alcohol and other drugs (AOD) use, while Commercial experience includes recent Chair Advisory Board with Girvan Group a boutique Building Construction and Fit Out company, Chair Advisory Board LR&M Construction a civil contractor in SA and Interim Board member with SmartCrete CRC. Complimentary skills include qualifications as a Mental Health First Aid Officer and Infrastructure Sustainability Assessor.

**Special responsibilities:**

Chair of Audit Risk Privacy & Finance (ARPF) Committee  
Member of Partner and Stakeholder Committee



**Name:** Elizabeth Whitelaw

**Title:** Director

**Qualifications:** BA LLB

**Experience and expertise:** For 32 years Elizabeth was a lawyer specialising in property, commercial and construction transactions. As a senior partner in Australia's largest Tier One law firm, she was also a Canberra Chair of Partners and a member of the firm's International Partnership Board for many years. Both during and after private practice, Elizabeth established a strong reputation as a highly motivated and effective board member, performing both chair and non-executive director roles for government-owned corporations, commercial partnerships, advisory bodies and not-for-profit organisations.

Elizabeth was a director of the Space Environment Research Centre Limited (SERC), a Commonwealth Research Centre dedicated to clearing Earth's inner atmosphere of "space junk" that threatens satellites vital to global communications, from its inception in 2014 until its successful completion in 2021. With SERC, she performed strategic roles as Chair of its Risk Management Committee, the Contracts and Licences Committee, and as a member of its Committees for Nominations and Remunerations and Audit. As well as her managerial talents and expertise, Elizabeth brings to SmartCrete a shared commitment to the betterment of our environment, for the benefit of current and future generations.

**Special responsibilities:**

Member of Audit Risk Privacy & Finance (ARPF) Committee



**Name:** Peter Williamson

**Title:** Director

**Qualifications:** BSc (Hons), MBA, MAUSIMM, GAICD

**Experience and expertise:** Peter is a highly energetic company Director with proven international business experience in the global technology, engineering, and resource sectors. Peter offers a rare combination of outstanding operational, strategic, financial, and technical skills. He is passionate about science, innovation and the translation of new thinking and technology from creative idea through to real world impact and economic and social benefit.

Utilising his strong interpersonal skills and hands on capabilities, he has directed a range of mineral resource, resource-related technology companies and innovative manufacturing companies and initiatives from research and concept through grass roots organic growth to international commercialisation and profitability.

In the early part of his career, he was awarded the Boral Magna Carta Award for Innovation for leading Boral's Asia-focused initiative to complete late stage Australian concrete systems R&D and commercialise across the region.

Peter's current consulting focus is on innovation effectiveness in SME's, business scale up capabilities, and corporate governance. He chairs the Advisory Boards of an Australian resource-focused, globally operating environmental consultancy and a specialist agency supporting the financial services sector.

Peter is a Member of the Australasian Institute of Mining and Metallurgy (AUSIMM) and a Graduate Member of the Australian Institute of Company Directors.

**Special responsibilities:**

Chair of Investment and Impact Committee

Member of the former Research Committee

Chair of the former IP & Commercialisation Committee



## ELECTION OF DIRECTORS, DATES AND ELECTION OUTCOMES

NAME	ROLE	APPOINTED	NUMBER OF MEETINGS HELD WHILE IN OFFICE	NUMBER OF MEETINGS ATTENDED
Elizabeth Taylor	Chair	16 June 2020	5	5
Gunilla Burrowes	Director	12 November 2020	4	4
Catherine Ferrari	Director	12 November 2020	4	4
Stephen Harmer	Director	16 June 2020	5	5
Daniel Johnson	Director	16 June 2020; resigned 12 November 2020	1	1
Elizabeth Whitelaw	Director	12 November 2020	4	4
Peter Williamson	Director	12 November 2020	4	4

## BOARD MEETINGS

NUMBER	DATE	LOCATION
1	21 October 2020	Virtual
2	18 November 2020	Virtual
3	18 February 2021	CRC Innovation Hub, Level 1, 3 Innovation Road, Macquarie University, Macquarie Park, NSW and virtual
4	12 May 2021	CRC Innovation Hub, Level 1, 3 Innovation Road, Macquarie University, Macquarie Park, NSW and virtual
5	17 June 2021	Virtual

## AUDIT, RISK, PRIVACY AND FINANCE (ARPF) COMMITTEE

The ARPF Committee oversees on behalf of the Board the activity to achieve the CRC Program objectives (as per the Grant Agreement) and SmartCrete CRCs own objectives (as per its Constitution) through excellent corporate governance pertaining to audit, risk, privacy and financial matters.

In addition, the committee oversees the risk register, logs key risks grouped by importance and supports the development of risk mitigation strategies with the management team.

The ARPF Committee met three times during 2020-2021.

NAME	ROLE	KEY SKILLS	NUMBER OF MEETINGS HELD WHILE IN OFFICE	NUMBER OF MEETINGS ATTENDED
Catherine Ferrari	Director	See Board Description	3	3
Stephen Harmer	ARPF Committee Chair/Director	See Board Description	3	3
Elizabeth Whitelaw	Director	See Board Description	3	3

## RESEARCH COMMITTEE

The Research Committee is responsible for the review of activity proposals submitted by partners, to provide recommendations to the Board and strategic advice on the quality of the R&D.

The committee was formed in January 2020 and met on six occasions during 2020-2021.

The Board agreed to merge this Committee with the IP and Commercialisation Committee in June 2021. The Investment and Impact Committee was formally approved on 4 August 2021.

NAME	ROLE	KEY SKILLS
Matthew Cuthbertson	Chair	Applied research, industry development and technology innovation
Gunilla Burrowes	Director, Member	See Board description
Peter Williamson	Director, Member	See Board description

## IP & COMMERCIALISATION COMMITTEE

The IP and Commercialisation Committee includes invited subject matter experts to consider appropriate approaches to IP and commercialisation matters for the CRC and make recommendations to the Board, as well as consider and make recommendations to the Board regarding the appropriateness of the CEO's funding recommendations for research project applications.

The committee was formed in November 2020 and met on six occasions during 2020-2021.

The Board agreed to merge this Committee with the Research Committee in June 2021. The Investment and Impact Committee was formally approved on 4 August 2021.

NAME	ROLE	KEY SKILLS	NUMBER OF MEETINGS HELD WHILE IN OFFICE	NUMBER OF MEETINGS ATTENDED
Peter Williamson	Director, Chair	See Board description	6	6
Gunilla Burrowes	Director, Member	See Board description	6	6
Elizabeth Taylor	Director, Guest	See Board description		5
Warren South	CEO, SmartCrete CRC	See Our Team description		2
Cheryl Farago	COO, SmartCrete CRC	See Our Team description		2
Simon Clark*	Research Director, SmartCrete CRC	Professor, School of Engineering, Macquarie University		2
Matthew Cuthbertson	Guest	Applied research, industry development and technology innovation		4

\*Resigned 26 March 2021

## CULTURE & PEOPLE COMMITTEE

The Culture and People Committee is an advisory committee formed to assist the Board in achieving CRC Program objectives (as per the Grant Agreement) and SmartCrete CRCs own objectives (as per its Constitution) through governance and advice pertaining to matters relating to SmartCrete CRCs culture and people.

The committee was established at the first meeting of the full Board in November 2020 and met on one occasion in 2020-2021, being 11 May 2021.

NAME	ROLE	KEY SKILLS
Gunilla Burrowes	Director, Chair	See Board description
Elizabeth Taylor	Director, Member	See Board description
Catherine Ferrari	Director, Member	See Board description
Warren South	CEO, SmartCrete CRC	See Our Team description

## PARTNER & STAKEHOLDER COMMITTEE

The Partner and Stakeholder Committee is an advisory committee formed with members drawn from the CRC Board and management. The committee assists the Board in achieving SmartCrete CRCs objectives through governance and advice relating to the management of SmartCrete CRCs partners and stakeholders.

The Partner and Stakeholder Committee was formed in May 2021 and has met formally on one occasion during 2020-2021, being May 2021. Individual members of the committee have also worked with the CEO and staff to provide advice and expertise on a range of matters as the communication and engagement strategies and plans for the SmartCrete CRC were developed.

NAME	ROLE	KEY SKILLS
Catherine Ferrari	Director, Chair	See Board description
Stephen Harmer	Director, Member	See Board description
Elizabeth Taylor	Director, Guest	See Board description
Warren South	CEO, SmartCrete CRC	See Our Team description
Daksh Baweja	Industry Liaison, SmartCrete CRC	See Our Team description
Zoe Schmidt	Partnerships, SmartCrete CRC	See Our Team description

# Our Team



**Dr Warren South**

Chief Executive Officer

Dr Warren South has worked in the heavy construction materials industry for over 25 years. He started his working career in cement in 1985 with Blue Circle Southern Cement at Berrima as Assistant Works Chemist, later to become Works Chemist in 1989. During this time he worked on the development of cement and concretes specifically for high durability applications such as the immersed tube units for the Sydney Harbour Tunnel and other important infrastructure projects.

In 1996, he moved to New Zealand to become Technical Manager for Golden Bay Cement. During this time he led the development of cements specifically for use in the South Pacific, dealing with three different Standards regimes also lead the development of inorganic polymer binders for concrete.

Moving back to Australia, he gained his doctorate in Civil Engineering from the University of Wollongong in 2010, dealing with the performance of cements based on natural pozzolanic materials available in New Zealand, the outcomes of which are seeing commercial reality.

Warren was previously the Director – Research and Technology for the industry organisation -Cement Concrete and Aggregates Australia. He maintains an active focus on addressing sustainability and resilience in terms of the cement and concrete industry and is a strong advocate for the positive contributions that concrete can make to the durability of the built environment.

Warren is also an Associate Professor (Honorary) in Civil Engineering at the University of Wollongong, Adjunct Associate Professor, Faculty of Engineering and Information Technology at the University of Technology – Sydney, and a member of the National Council of the Concrete Institute of Australia.



**Cheryl Farago**

Chief Operating Officer

Cheryl is a highly accomplished Business, Finance and Project Manager with a proven track record of facilitating innovation through the establishment of robust business systems, effective stakeholder management and staff development. Prior to joining the SmartCrete CRC team, Cheryl held the position of Department Manager for Molecular Sciences at Macquarie University where she was responsible for the utilisation of financial and human resources to deliver improvements in the areas of research performance, student education experience and community engagement.

Cheryl has demonstrated the ability to improve efficiencies, increase transparencies and streamline processes in leadership positions in both the public and private sectors and across multiple industries including manufacturing, business consulting and retail. Some of Cheryl's previous roles included her position as the Budget Manager for the South African Parliament and the Senior Business Manager for the Biological and Environmental Sciences and Engineering Division at the King Abdullah University of Science & Technology.

Cheryl holds a Master of Science degree in Project Management and a Bachelor of Commerce degree (Honours). Cheryl is also a certified Project Management Professional.



### **Daksh Baweja**

Director – Industry Liaison

Daksh Baweja is Director – Materials for BG&E Consulting. This is a specialist group within a broader civil/structural consultancy that provides strategic advice in areas relating to civil engineering materials. Daksh is also Industry Fellow at the School of Civil and Environmental Engineering at the University of Technology in Sydney. He started his career with the Electricity Commission of NSW as a civil engineer and completed his Masters degree in civil engineering by research on durability of fly ash and other concretes. He then worked in research at the CSIRO Division of Building, Construction and Engineering where he completed his PhD in civil engineering on corrosion of steel reinforcement in concrete.

Following that, he worked with CSR, Readymix, Rinker and CEMEX Australia in various functional management roles prior to setting up his consultancy and commencing at UTS from 2009. Daksh is actively involved in knowledge management, marketing and commercial R&D and is the author of over 120 research papers into aspects relating to concrete materials, structural design, concrete durability and serviceability in major infrastructure. He is a Past President of the Concrete Institute of Australia, Fellow of Engineers Australia and received an award for outstanding contributions to concrete technology from the American Concrete Institute in 2007. He received Life Membership of the Concrete Institute of Australia in 2013 and became a Fellow of the American Concrete Institute in 2014. He was Chair of the Concrete Institute of Australia organising committee for the Concrete 2019 Biennial conference in Sydney, September 2019. In 2021, he became Director – Industry Liaison for the SmartCrete Cooperative Research Centre.



### **Zoe Schmidt**

Director – Partnerships

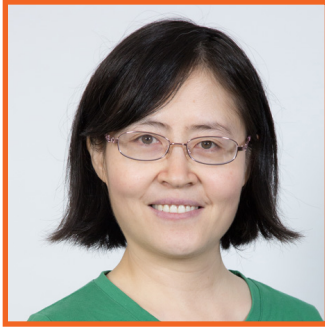
Zoe Schmidt is the Director – Partnerships for SmartCrete CRC. She previously ran her own Consultancy business where she supported the civil, materials and construction industries in all facets of concrete from material science to site investigations and support.

Zoe commenced her career in the cement industry working for Blue Circle Cement in Johannesburg, South Africa where her technical capabilities evolved in concrete laboratories. This led her to further her career to technical selling and commercial roles within concrete material science and practices.

She later relocated to Durban to fulfill a Regional Technical Management role with Alpha Stone and Readymix, owned by Holcim AG, Switzerland, where she later took a consultant role supporting the global Readymix concrete divisions within Holcim.

In 2009, Zoe accepted the position of National Technical Manager for Admixtures and Additives with Sika Australia, and later rejoined Holcim Australia as the Regional Technical Manager for NSW. Zoe has built a strong network of industry and academic contacts in all areas within the concrete and associated industries.

Zoe has a Masters Degree in Concrete Technology. Her passion is education and training, complex research solutions and collaborating with likeminded peers.



**Nancy Li**

Salesforce Business Analyst

Nancy is a highly experienced administrator with an extensive background in the delivery of high quality administration services with a wide-ranging proven skillset across program administration, systems administration, project management, compliance, data integration, reporting, funding administration, data analysis, and client service.

Nancy has been involved in designing and implementing new and improved systems across a diverse range of administrative functions. She has advanced problem-solving skills with a proven ability to deliver cost-effective solutions, project managing data integration projects, tracking record of using a variety of software and systems, typically with advanced Excel skills, Power BI, Microsoft Forms, Microsoft Automate, Powerapps, Salesforce. Nancy received a 2019 Staff Excellence Award from the Faculty of Science and Engineering at Macquarie University for her contribution to enhancing working efficiency and automating and standardising processes by utilising a variety of tools.

# Financial Management



The directors present their report, together with the financial statements, on the company for the period ended 30 June 2021.

### **Directors**

The following persons were directors of the company during the whole of the financial period and up to the date of this report, unless otherwise stated:

Em Prof Elizabeth Taylor AO	(Appointed 16 June 2020)
Dr Gunilla Burrowes	(Appointed 12 November 2020)
Catherine Ferrari	(Appointed 12 November 2020)
Stephen Harmer	(Appointed 16 June 2020)
Elizabeth Whitelaw	(Appointed 12 November 2020)
Peter Williamson	(Appointed 12 November 2020)
Prof. Dan Johnson	(Appointed 16 June 2020 / Resigned 12 November 2020)

### **Objectives**

The objectives of the company is to promote scientific and engineering research for the development of Australia's concrete industry, including without limitation, developments within the concrete supply chain and associated industries for the public benefit.

### **Principal activities**

The company was incorporated on the 16<sup>th</sup> of June 2020.

The principal activity of SmartCrete CRC during the financial period was to transition from the bid stage to the establishment phase of the Cooperative Research Centre and construct the operating and governance frameworks necessary to administer the research program.

By the end of the year, the first tranche of projects was approved and commenced.



**Information on directors**

**Name:** **Em Professor Elizabeth Taylor AO**  
**Title:** Director  
**Qualifications:** Em Professor, Hon.DEng (UNSW) BE LLB(Hons), HonFIEAust FTSE FAICD  
**Experience and expertise:** Elizabeth Taylor specialises in governance effectiveness and ecosystem analysis.

Following a career in industry as a design and construction engineer, Elizabeth moved into academe, finishing her academic career as Pro Vice-Chancellor and Executive Dean, Faculty of Sciences, Engineering and Health, CQUniversity. Since 2013 she undertaken numerous independent assurance reviews and smart buyer analysis of complex engineering projects.

Over her career Elizabeth has built extensive Board-level leadership in professional organisations and innovative technology entities. Currently she is Chair of SmartCrete Cooperative Research Centre (focused on concrete) and Chair, Washington Accord, and Deputy Chair, Governing Group, of the International Engineering Alliance, a suite of international agreements governing the recognition of engineering educational qualifications and professional competence.

Elizabeth has always engaged in diverse pro-bono work. Currently she is Chair of the Cambodian Children's Trust Australia. She recently retired as Chair of RedR Australia, an humanitarian response agency, standby partner to 14 UN agencies and manager of Australia Assists, the Australian Government's humanitarian civilian deployment program, She was Chair of RedR International until May 2021. She is recognised as one of Australia's 100 most influential engineers.

**Special responsibilities:** Board Chair  
Member of Culture and People Committee

**Name:** **Dr Gunilla Burrowes**  
**Title:** Director  
**Qualifications:** FTSE HonFIEAust GAICD  
**Experience and expertise:** An electrical engineer with a broad range of industry and academic experience, Gunilla is passionate about innovation, entrepreneurship, technology commercialisation and improving diversity and inclusion in the workplace.

In 2000, she founded an underwater tech company, BlueZone Group with her husband which now has two offices in Newcastle and Perth. Gunilla is also co-founder of a consultancy, Gender Matters that advises organisations on gender equity and has a unique approach to mitigating cognitive bias in decision-making.

Gunilla is the inaugural Chair of Eighteen04 (an inspirational co-working and incubator space for companies scaling in the clean tech and smart city area) and inaugural board member of Hunter iF project (an open consortium of leading organisations in the Hunter that supports the growing startup ecosystem in the region). She is a member of the Hunter Angels and has been an Angel Investor for over 10 years. Gunilla has graduated from the AICD Directors Course and is on numerous company boards including the Blue Economy CRC. She has been a National Vice President of Engineers Australia, awarded an Honorary Fellow of Engineers Australia in 2017 and invited as a Fellow of the Australian Academy of Technology and Engineering in 2019.

**Special responsibilities:** Chair of Culture and People Committee  
Member of Investment and Impact Committee  
Member of the former Research Committee  
Member of the former IP & Commercialisation Committee

**Name:** **Catherine Ferrari**  
**Title:** Director  
**Qualifications:** B.Bus, MLM, FCPA, GAICD  
**Experience and expertise:** Catherine has had an extensive career holding a range of senior executive roles as well as non-executive director roles. Most recently Catherine was the General Manager Customer and Community at the Water Corporation. Previous roles include CEO of the West Australian Symphony Orchestra and State Director of CPA Australia (Western Australia). Catherine is the Deputy Chair of the West Australian Opera, a Trustee of the Legal Contribution Trust, and a Director of Racing and Wagering Western Australia.

As an experienced senior management professional Catherine has a record of developing and growing organisational culture and vision and has extensive experience in the effective development and implementation of strategy, planning, policy, budgeting, reporting, marketing, advertising and all aspects of customer and public relations.

With 20+ years' experience of Board roles, in a diverse range of sectors and industries, and also of working with boards at senior executive level Catherine is well versed in governance principles and has experience in high level board decision making and advisory input.

**Special responsibilities:** Chair of Partner and Stakeholder Committee  
Member of Audit Risk Privacy & Finance (ARPF) Committee  
Member of Culture and People Committee

**Name:** **Stephen Harmer**  
**Title:** Director  
**Qualifications:** BComm (Marketing), GAICD  
**Experience and expertise:** Stephen brings over 40 years' experience in general management, strategy development, business development and marketing of fast-moving consumer goods, industrial, B2B and services markets and, significant supply chain and procurement network relationships across the construction and infrastructure sectors including directly applicable experience in the concrete market as Group Marketing Manager with CRS Readymix.

Stephen is the Director of Insight Business Strategy Advisory (InsightBSA) specialising in business strategy advisory and governance services to the corporate and government sectors, which creates value for clients through the delivery of sustainable strategies, achievable execution plans, leadership mentoring and governance.

Current Governance experience includes Not For Profit roles as a Board member / Treasurer/ Chair Finance, Risk and Audit Committee Sydney Drug Education & Counselling Centre (SDECC) which specialises in providing counselling and support for young people aged 12 -25 with problematic alcohol and other drugs (AOD) use, while Commercial experience includes recent Chair Advisory Board with Girvan Group a boutique Building Construction and Fit Out company, Chair Advisory Board LR&M Construction a civil contractor in SA and Interim Board member with SmartCrete CRC. Complimentary skills include qualifications as a Mental Health First Aid Officer and Infrastructure Sustainability Assessor.

**Special responsibilities:** Chair of Audit Risk Privacy & Finance (ARPF) Committee  
Member of Partner and Stakeholder Committee

**Name:** **Elizabeth Whitelaw**  
**Title:** Director  
**Qualifications:** BA LLB  
**Experience and expertise:** For 32 years Elizabeth was a lawyer specialising in property, commercial and construction transactions. As a senior partner in Australia's largest Tier One law firm, she was also a Canberra Chair of Partners and a member of the firm's International Partnership Board for many years. Both during and after private practice, Elizabeth established a strong reputation as a highly motivated and effective board member, performing both chair and non-executive director roles for government-owned corporations, commercial partnerships, advisory bodies and not-for-profit organisations.

Elizabeth was a director of the Space Environment Research Centre Limited (SERC), a Commonwealth Research Centre dedicated to clearing Earth's inner atmosphere of "space junk" that threatens satellites vital to global communications, from its inception in 2014 until its successful completion in 2021. With SERC, she performed strategic roles as Chair of its Risk Management Committee, the Contracts and Licences Committee, and as a member of its Committees for Nominations and Remunerations and Audit. As well as her managerial talents and expertise, Elizabeth brings to SmartCrete a shared commitment to the betterment of our environment, for the benefit of current and future generations.

**Special responsibilities:** Member of Audit Risk Privacy & Finance (ARPF) Committee

**Name:** **Peter Williamson**  
**Title:** Director  
**Qualifications:** BSc (Hons), MBA, MAUSIMM, GAICD  
**Experience and expertise:** Peter is a highly energetic company Director with proven international business experience in the global technology, engineering, and resource sectors. Peter offers a rare combination of outstanding operational, strategic, financial, and technical skills. He is passionate about science, innovation and the translation of new thinking and technology from creative idea through to real world impact and economic and social benefit.

Utilising his strong interpersonal skills and hands on capabilities, he has directed a range of mineral resource, resource-related technology companies and innovative manufacturing companies and initiatives from research and concept through grass roots organic growth to international commercialisation and profitability.

In the early part of his career, he was awarded the Boral Magna Carta Award for Innovation for leading Boral's Asia-focused initiative to complete late stage Australian concrete systems R&D and commercialise across the region.

Peter's current consulting focus is on innovation effectiveness in SME's, business scale up capabilities, and corporate governance. He chairs the Advisory Boards of an Australian resource-focused, globally operating environmental consultancy and a specialist agency supporting the financial services sector.

Peter is a Member of the Australasian Institute of Mining and Metallurgy (AUSIMM) and a Graduate Member of the Australian Institute of Company Directors.

**Special responsibilities:** Chair of Investment and Impact Committee  
Member of the former Research Committee  
Chair of the former IP & Commercialisation Committee

Name: **Prof. Dan Johnson**  
 Title: Director (Resigned 12 November 2020)  
 Qualifications: BSc (Hons), PhD, MBA  
 Experience and expertise: Dan is Pro Vice-Chancellor (Research Innovation) at Macquarie University Dan is Pro Vice-Chancellor (Research Innovation) at Macquarie University.

Dan has worked in research, development, technology transfer and innovation for nearly 20 years, primarily in the not-for-profit sector. Prior to joining Macquarie University Dan was Managing Director of The Australian Wine Research Institute (AWRI) from 2011 to 2020, and he retains an Honorary Fellowship with this organisation.

Dan has extensive experience as Chair, Director or member of numerous Boards and committees in the scientific and agricultural sectors. He is currently a member of the Centre for Nanoscale BioPhotonics Advisory Board and Chair of the Macquarie University Intellectual Property and Commercialisation Advisory Committee.

Special responsibilities: Initial Director until first Annual General Meeting of the company

### Meetings of directors

The number of meetings of the company's Board of Directors ('the Board') and the Board Committees held during the period ended 30 June 2021, and the number of meetings attended by each director were:

	Full Board		Culture and People Committee		Audit, Risk, Privacy and Finance Committee	
	Held	Attended	Held	Attended	Held	Attended
Em Prof Elizabeth Taylor AO	5	5	1	1		
Dr Gunilla Burrowes	4	4	1	1		
Catherine Ferrari	4	4	1	1	3	3
Stephen Harmer	5	5			3	3
Elizabeth Whitelaw	4	4			3	3
Peter Williamson	4	4				
Prof. Dan Johnson	1	1				

	Research Committee * #		IP & Commercialisation Committee * #		Partners and Stakeholders Committee *	
	Held	Attended	Held	Attended	Held	Attended
Em Prof Elizabeth Taylor AO				5 (as guest)	1	1 (as guest)
Dr Gunilla Burrowes	6	6	6	6		
Catherine Ferrari					1	1
Stephen Harmer					1	1
Elizabeth Whitelaw						
Peter Williamson	6	6	6	6		
Prof. Dan Johnson						

Held: represents the number of meetings held during the time the director held office.

\* Committee includes other non-Director members

# merged into the Investment and Impact Committee in June 2021

### Review of Operations

The company has generated a surplus of \$4,880,443 for the period from 16 June 2020 to 30 June 2021.

During its first year of operations, SmartCrete CRC recognised revenue from the Commonwealth, the Office of the NSW Chief Scientist and Engineer and SmartCrete CRC partner organisations.

The expenditure for the year relates predominantly to the establishment of the CRC including its legal and governance framework. Other major expenditure items are attributable to the implementation of the Turnkey program management system and employee remuneration.

The impact of Covid-19 on the operating environment resulted in a delay to the signing of partner agreements and consequently, delayed research expenditure.

#### **Events after the reporting period**

No other matter or circumstance has arisen since 30 June 2021 that has significantly affected, or may significantly affect the company's operations, the results of those operations, or the company's state of affairs in future financial years.

#### **Contributions on winding up**

In the event of the company being wound up, ordinary members are required to contribute a maximum of \$50 each.

The total amount that members of the company are liable to contribute if the company is wound up is \$500, based on 10 current ordinary members.

#### **Company Officers**

Sally Vardy has served as the Company Secretary since 16 June 2020.

#### **Details of Indemnity Insurance**

A premium of \$2,635 has been paid for the period 1 July 2020 to 30 June 2021 for a Business Protection Management Liability policy. Coverage extends to the areas of Directors and Officers liability, employment practices liability, statutory liability and company liability.

#### **Auditor's independence declaration**

A copy of the auditor's independence declaration as required under Division 60 of the Australian Charities and Not-for-Profits Commission Act 2012 is set out immediately after this directors' report.

This report is made in accordance with a resolution of directors.

On behalf of the directors



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Elizabeth Taylor  
Director



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Stephen Harmer  
Director

23 September 2021



**LBW & Partners**

Chartered Accountants & Business Advisors  
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**Partners**

Elias Y Bader

Rupa Dharmasiri

George P Rochios

Mark W Willock

**SmartCrete CRC Ltd**

**Auditor's Independence Declaration to the Directors of SmartCrete CRC Ltd**

In accordance with the requirements of section 60-40 of the Australian Charities and Not-for-profits Commission Act 2012, as auditor of SmartCrete CRC Ltd for the period from 16 June 2020 to 30 June 2021, I declare that, to the best of my knowledge and belief, there have been:

- (i) no contraventions of the auditor independence requirements as set out in the *Australian Charities and Not-for-profits Commission Act 2012* in relation to the audit; and
- (ii) no contraventions of any applicable code of professional conduct in relation to the audit.

Rupaninga Dharmasiri  
Partner

LBW & Partners  
Chartered Accountants  
Level 3, 845 Pacific Highway  
CHATSWOOD NSW 2067

Dated this 22nd day of September 2021

**SMARTCRETE CRC LTD****STATEMENT OF PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME  
FOR THE PERIOD ENDED 30 JUNE 2021**

	Note	16 June 2020 to 30 June 2021 \$
<b>Revenue</b>	4	9,655,920
<b>Expenses</b>		
Research and development expenses:		
- In-kind partner contributions		(2,758,420)
- Other		(52,500)
Employee benefits expense		(641,161)
Consulting expenses		(662,584)
Other expenses		(660,812)
Total expenses		<u>(4,775,477)</u>
<b>Surplus before income tax expense</b>		4,880,443
Income tax expense		<u>-</u>
<b>Surplus after income tax expense for the period</b>		4,880,443
Other comprehensive income for the period, net of tax		<u>-</u>
<b>Total comprehensive income for the period</b>		<u><u>4,880,443</u></u>

The above statement of profit or loss and other comprehensive income should be read in conjunction with the accompanying notes.

**SMARTCRETE CRC LTD**  
**STATEMENT OF FINANCIAL POSITION**  
 FOR THE PERIOD ENDED 30 JUNE 2021

	Note	2021 \$
<b>Assets</b>		
<b>Current assets</b>		
Cash and cash equivalents	6	5,054,736
Trade and other receivables	7	273,858
Prepayments		14,991
Total current assets		<u>5,343,585</u>
<b>Non-current assets</b>		
Property, plant and equipment	8	13,216
Total non-current assets		<u>13,216</u>
<b>Total assets</b>		<u>5,356,801</u>
<b>Liabilities</b>		
<b>Current liabilities</b>		
Trade and other payables	9	313,399
Partner contributions received in advance		129,417
Employee benefits	10	33,542
Total current liabilities		<u>476,358</u>
<b>Total liabilities</b>		<u>476,358</u>
<b>Net assets</b>		<u><u>4,880,443</u></u>
<b>Equity</b>		
Retained surpluses		<u>4,880,443</u>
<b>Total equity</b>		<u><u>4,880,443</u></u>

The above statement of financial position should be read in conjunction with the accompanying notes.



**SMARTCRETE CRC LTD****STATEMENT OF CHANGES IN EQUITY**  
FOR THE PERIOD ENDED 30 JUNE 2021

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	<b>Retained surpluses \$</b>	<b>Total equity \$</b>
Balance at 16 June 2020	-	-
Surplus after income tax expense for the period	4,880,443	4,880,443
Other comprehensive income for the period, net of tax	-	-
Total comprehensive income for the period	<u>4,880,443</u>	<u>4,880,443</u>
Balance at 30 June 2021	<u><u>4,880,443</u></u>	<u><u>4,880,443</u></u>

*The above statement of changes in equity should be read in conjunction with the accompanying notes.*

**SMARTCRETE CRC LTD**  
**STATEMENT OF CASH FLOWS**  
 FOR THE PERIOD ENDED 30 JUNE 2021

	Note	16 June 2020 to 30 June 2021 \$
<b>Cash flows from operating activities</b>		
Grant received from Commonwealth Government		4,565,000
Partner cash contributions received		2,569,824
Receipt from other sources		300,500
Payments to suppliers and employees		<u>(2,362,467)</u>
Net cash from operating activities		<u>5,072,857</u>
<b>Cash flows from investing activities</b>		
Payments for property, plant and equipment	8	<u>(18,121)</u>
Net cash used in investing activities		<u>(18,121)</u>
<b>Cash flows from financing activities</b>		
Proceeds from loan from related party		550,000
Repayment of loan to related party		<u>(550,000)</u>
Net cash from financing activities		<u>-</u>
Net increase in cash and cash equivalents		5,054,736
Cash and cash equivalents at the beginning of the financial period		<u>-</u>
Cash and cash equivalents at the end of the financial period	6	<u><u>5,054,736</u></u>

The above statement of cash flows should be read in conjunction with the accompanying notes.

### **Note 1. General information**

The financial statements cover SmartCrete CRC Ltd as an individual entity. The financial statements are presented in Australian dollars, which is SmartCrete CRC Ltd's functional and presentation currency.

SmartCrete CRC Limited is a not-for-profit unlisted public company limited by guarantee, incorporated and domiciled in Australia. It is registered as a charity with Australian Charities and Not-for-profits Commission.

The company was incorporated on 16 June 2020 and these financial statements cover the operations from the date of incorporation to 30 June 2021.

Its registered office and principal place of business are:

CRC Innovation Hub  
Level 1, 3 Innovation Road  
Macquarie University  
Macquarie Park, NSW 2113

A description of the nature of the company's operations and its principal activities are included in the directors' report, which is not part of the financial statements.

The financial statements were authorised for issue, in accordance with a resolution of directors, on 23 September 2021.

### **Note 2. Significant accounting policies**

The principal accounting policies adopted in the preparation of the financial statements are set out below.

#### **New or amended Accounting Standards and Interpretations adopted**

The company has adopted all of the new or amended Accounting Standards and Interpretations issued by the Australian Accounting Standards Board ('AASB') that are mandatory for the current reporting period.

The adoption of these Accounting Standards and Interpretations did not have any significant impact on the financial performance or position of the company.

The following Accounting Standard is most relevant to the company:

#### ***AASB 1060 General Purpose Financial Statements - Simplified Disclosures for For-Profit and Not-for-Profit Tier 2 Entities***

The company has early adopted AASB 1060 from 16 June 2020 as permitted by AASB 1053. AASB 1060 provides a new Tier 2 reporting framework with simplified disclosures that are based on the requirements of IFRS for SMEs.

#### **Basis of preparation**

These general purpose financial statements have been prepared in accordance with the Australian Accounting Standards - Simplified Disclosures issued by the Australian Accounting Standards Board ('AASB'), the Australian Charities and Not-for-profits Commission Act 2012 and associated regulations.

#### ***Historical cost convention***

The financial statements have been prepared under the historical cost convention.

#### ***Critical accounting estimates***

The preparation of the financial statements requires the use of certain critical accounting estimates. It also requires management to exercise its judgement in the process of applying the company's accounting policies. The areas involving a higher degree of judgement or complexity, or areas where assumptions and estimates are significant to the financial statements, are disclosed in note 3.

## **Note 2. Significant accounting policies (continued)**

### **Revenue recognition**

The company recognises revenue as follows:

#### *Revenue from contracts with customers*

Revenue is recognised at an amount that reflects the consideration to which the company is expected to be entitled in exchange for transferring goods or services to a customer. For each contract with a customer, the company: identifies the contract with a customer; identifies the performance obligations in the contract; determines the transaction price which takes into account estimates of variable consideration and the time value of money; allocates the transaction price to the separate performance obligations on the basis of the relative stand-alone selling price of each distinct good or service to be delivered; and recognises revenue when or as each performance obligation is satisfied in a manner that depicts the transfer to the customer of the goods or services promised.

#### *Revenue recognition policy for contracts which are either not enforceable or do not have sufficiently specific performance obligations (AASB1058)*

Income from grants or other sources that generally do not have sufficiently specific performance obligations are recognised at the fair value of the asset when such asset is received. The company considers whether there are any related liabilities or equity items associated with the asset – these are recognised in accordance with the relevant accounting standard and once the assets and liabilities have been recognised then income is recognised for any remaining asset value at the time that the asset is received.

Revenue recognition policy for specific revenue sources are as follows:

#### *Grants*

Where grant income arises from an agreement which is enforceable and contains sufficiently specific performance obligations then the revenue is recognised in accordance with AASB 15 when control of each performance obligations is satisfied. Where control is transferred over time, generally the input method being costs or time incurred is deemed to be the most appropriate methods to reflect the transfer of benefit.

For those grant contracts that are not enforceable or the performance obligations are not sufficiently specific, income is recognised upon receipt of the grant in line with AASB 1058.

#### *Partner cash contributions*

Partner cash contributions are recognised as revenue upon invoicing in line with the terms of the partnership agreement. Contributions relating to future periods received in advance are deferred and recognised as income in the related period.

#### *Partner in-kind contributions*

In-kind contributions comprise of staffing and other administrative costs and outgoings incurred by the partners in relation to the CRC program as per terms of the partnership agreements with the company. The contributions are recognised directly in the profit and loss as revenue and equal amount is recognised as research and development expenses in the profit and loss.

In-kind staff contributions are recognised based on calculations in accordance with Cooperative Research Centre (CRC) project guidelines. In-kind non-staff contributions are outgoings incurred by the partners in connection with the project activities.

#### *Rendering of services*

Revenue from a contract to provide services is recognised over time as the services are rendered based on either a fixed price or an hourly rate.

#### *Other revenue*

Other revenue is recognised when it is received or when the right to receive payment is established.

### **Income tax**

As the company is a charity in terms of subsection 50-5 of the Income Tax Assessment Act 1997, as amended, it is exempt from paying income tax.

## **Note 2. Significant accounting policies (continued)**

### **Cash and cash equivalents**

Cash and cash equivalents includes cash on hand, deposits held at call with financial institutions, other short-term, highly liquid investments with original maturities of three months or less that are readily convertible to known amounts of cash and which are subject to an insignificant risk of changes in value.

### **Trade and other receivables**

Trade receivables are initially recognised at fair value and subsequently measured at amortised cost using the effective interest method, less any allowance for expected credit losses. Trade receivables are generally due for settlement within 30 days.

The company has applied the simplified approach to measuring expected credit losses, which uses a lifetime expected loss allowance. To measure the expected credit losses, trade receivables have been grouped based on days overdue.

### **Property, plant and equipment**

Plant and equipment is stated at historical cost less accumulated depreciation and impairment. Historical cost includes expenditure that is directly attributable to the acquisition of the items.

Depreciation is calculated on a written down value basis to write off the net cost of each item of property, plant and equipment over their expected useful lives as follows:

Office equipment	3 years
------------------	---------

The residual values, useful lives and depreciation methods are reviewed, and adjusted if appropriate, at each reporting date.

An item of property, plant and equipment is derecognised upon disposal or when there is no future economic benefit to the company. Gains and losses between the carrying amount and the disposal proceeds are taken to profit or loss.

### **Trade and other payables**

These amounts represent liabilities for goods and services provided to the company prior to the end of the financial period and which are unpaid. Due to their short-term nature they are measured at amortised cost and are not discounted. The amounts are unsecured and are usually paid within 30 days of recognition.

### **Employee benefits**

#### *Short-term employee benefits*

Liabilities for wages and salaries, including non-monetary benefits, annual leave and long service leave expected to be settled wholly within 12 months of the reporting date are measured at the amounts expected to be paid when the liabilities are settled.

#### *Defined contribution superannuation expense*

Contributions to defined contribution superannuation plans are expensed in the period in which they are incurred.

### **Goods and Services Tax ('GST') and other similar taxes**

Revenues, expenses and assets are recognised net of the amount of associated GST, unless the GST incurred is not recoverable from the tax authority. In this case it is recognised as part of the cost of the acquisition of the asset or as part of the expense.

Receivables and payables are stated inclusive of the amount of GST receivable or payable. The net amount of GST recoverable from, or payable to, the tax authority is included in other receivables or other payables in the statement of financial position.

Cash flows are presented on a gross basis. The GST components of cash flows arising from investing or financing activities which are recoverable from, or payable to the tax authority, are presented as operating cash flows.

Commitments and contingencies are disclosed net of the amount of GST recoverable from, or payable to, the tax authority.

**Note 3. Critical accounting judgements, estimates and assumptions**

The preparation of the financial statements requires management to make judgements, estimates and assumptions that affect the reported amounts in the financial statements. Management continually evaluates its judgements and estimates in relation to assets, liabilities, contingent liabilities, revenue and expenses. Management bases its judgements, estimates and assumptions on historical experience and on other various factors, including expectations of future events, management believes to be reasonable under the circumstances. The resulting accounting judgements and estimates will seldom equal the related actual results. The judgements, estimates and assumptions that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities (refer to the respective notes) within the next financial year are discussed below.

*Coronavirus (COVID-19) pandemic*

Judgement has been exercised in considering the impacts that the Coronavirus (COVID-19) pandemic has had, or may have, on the company based on known information. This consideration extends to the nature of the activities, customers, suppliers, staffing and geographic regions in which the company operates. Other than as addressed in specific notes, there does not currently appear to be either any significant impact upon the financial statements or any significant uncertainties with respect to events or conditions which may impact the company unfavourably as at the reporting date or subsequently as a result of the Coronavirus (COVID-19) pandemic.

*Allowance for expected credit losses*

The allowance for expected credit losses assessment requires a degree of estimation and judgement. It is based on the lifetime expected credit loss, grouped based on days overdue, and makes assumptions to allocate an overall expected credit loss rate for each group. These assumptions include recent sales experience and historical collection rates.

*Grants income*

For the grants received, the determination of whether the contract includes sufficiently specific performance obligations was a significant judgement involving discussions with a number of parties at the company, review of the proposal documents prepared during the grant application phase and consideration of the terms and conditions.

Grants received by the company have been accounted for under both AASB 15 and AASB 1058 depending on the terms and conditions and decisions made. If this determination was changed then the revenue recognition pattern would be different from that recognised in these financial statements.

**Note 4. Revenue**

	<b>16 June 2020 to 30 June 2021 \$</b>
<i>Revenue from contracts with customers</i>	
Other grants	300,000
Membership fees	500
	<u>300,500</u>
<i>Other revenue</i>	
Commonwealth CRC grant	4,150,000
Project partners - cash contributions	2,447,000
Project partners - in-kind staff contributions	2,200,159
Project partners - in-kind non-staff contributions	558,261
	<u>9,355,420</u>
Revenue	<u><u>9,655,920</u></u>

**Note 4. Revenue (continued)**

**Disaggregation of revenue**

The disaggregation of revenue from contracts with customers is as follows:

	16 June 2020 to 30 June 2021 \$
<i>Timing of revenue recognition</i>	
Services transferred over time	<u>300,500</u>

**Additional disclosure on revenue from Government sources (including grants)**

The details of government revenue by level of government and department name is as follows:

<b>Commonwealth Government:</b>	
Department of Industry, Science, Energy and Resources	<u>4,150,000</u>
<b>State Government:</b>	
NSW Department of Planning, Industry and Environment	<u>300,000</u>
<b>Total</b>	<b><u>4,450,000</u></b>

**Note 5. Expenses**

	16 June 2020 to 30 June 2021 \$
Surplus before income tax includes the following specific expenses:	
<i>Depreciation on property, plant and equipment</i>	
Office equipment	<u>4,905</u>
<i>Superannuation expense</i>	
Defined contribution superannuation expense	<u>45,812</u>
<i>Expected credit losses</i>	
Allowance for expected credit losses	<u>78,375</u>

**Note 6. Cash and cash equivalents**

	2021 \$
<i>Current assets</i>	
Cash at bank	<u>5,054,736</u>

**Note 7. Trade and other receivables**

	<b>2021</b>
	<b>\$</b>
<i>Current assets</i>	
Trade receivables	352,233
Less: Allowance for expected credit losses	<u>(78,375)</u>
	<u><u>273,858</u></u>

**Note 8. Property, plant and equipment**

	<b>2021</b>
	<b>\$</b>
<i>Non-current assets</i>	
Office equipment - at cost	18,121
Less: Accumulated depreciation	<u>(4,905)</u>
	<u><u>13,216</u></u>

*Reconciliations*

Reconciliations of the written down values at the beginning and end of the current financial period are set out below:

	Office equipment - at cost \$	Total \$
Balance at 16 June 2020	-	-
Additions	18,121	18,121
Depreciation expense	<u>(4,905)</u>	<u>(4,905)</u>
Balance at 30 June 2021	<u><u>13,216</u></u>	<u><u>13,216</u></u>

**Note 9. Trade and other payables**

	<b>2021</b>
	<b>\$</b>
<i>Current liabilities</i>	
Trade payables	48,267
Accrued expenses	85,047
BAS payable	156,984
Other payables	<u>23,101</u>
	<u><u>313,399</u></u>

**Note 10. Employee benefits**

	<b>2021</b>
	<b>\$</b>
<i>Current liabilities</i>	
Annual leave	<u><u>33,542</u></u>



**Note 11. Key management personnel disclosures**

*Compensation*

The aggregate compensation made to directors and other members of key management personnel of the company is set out below:

	<b>16 June 2020 to 30 June 2021 \$</b>
Aggregate compensation	<u><u>372,070</u></u>

**Note 12. Remuneration of auditors**

During the financial period the following fees were paid or payable for services provided by , the auditor of the company:

	<b>16 June 2020 to 30 June 2021 \$</b>
<i>Audit services -</i> Audit of the financial statements	<u>10,000</u>
<i>Other services -</i> Preparation of financial statements	<u>1,500</u>
	<u><u>11,500</u></u>

**Note 13. Related party transactions**

*Parent entity*

SmartCrete CRC Ltd is the parent entity.

*Key management personnel*

Disclosures relating to key management personnel are set out in note 11.

*Transactions with related parties*

The following transactions occurred with related parties:

	<b>16 June 2020 to 30 June 2021 \$</b>
Membership fee income received from members	500
Cash Contribution from members as project partners	1,515,000
In-kind staff contributions from members as project partners	558,261
In-kind non-staff contributions from members as project partners	1,207,109
Payment for goods and services:	
Payment for services from key management personnel	11,125
Payment for services from director related entities	256,833
Payment for services from member entities	343,000
Other transactions:	
Loan from member	550,000
Loan repaid to member	550,000

**Note 13. Related party transactions (continued)**

*Receivable from and payable to related parties*

The following balances are outstanding at the reporting date in relation to transactions with related parties:

	<b>2021</b>
	<b>\$</b>
Current receivables:	
Trade receivables from members	78,375
Allowance for expected credit losses	78,375
Current payables:	
Fees payable to key management personnel	17,580

*Loans to/from related parties*

There were no loans to or from related parties at the reporting date.

*Terms and conditions*

All transactions were made on normal commercial terms and conditions and at market rates except for the loan extended by the members which was interest free.

**Note 14. Contingent liabilities**

The company had no contingent liabilities as at 30 June 2021.

**Note 15. Economic dependency**

The company is dependent on government grants and contributions from its partners as its source of revenue. At the date of this report the directors have no reason to believe the government grants and support from partners will not continue.

**Note 16. Events after the reporting period**

No matter or circumstance has arisen since 30 June 2021 that has significantly affected, or may significantly affect the company's operations, the results of those operations, or the company's state of affairs in future financial years.

In the directors' opinion:

- the attached financial statements and notes comply with the Australian Charities and Not-for-profits Commission Act 2012, the Australian Accounting Standards - Simplified Disclosures and other mandatory professional reporting requirements;
- the attached financial statements and notes give a true and fair view of the company's financial position as at 30 June 2021 and of its performance for the financial period ended on that date; and
- there are reasonable grounds to believe that the company will be able to pay its debts as and when they become due and payable.

This declaration is signed in accordance with subs 60.15(2) of the Australian Charities and Not-for-profits Commission Regulation 2013.

On behalf of the directors



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Elizabeth Taylor  
Director



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Stephen Harmer  
Director

23 September 2021

**LBW & Partners**

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**Partners**

Elias Y Bader

Rupa Dharmasiri

George P Rochlios

Mark W Willock

**SmartCrete CRC Ltd****Independent Auditor's Report to the Members of SmartCrete CRC Ltd****Opinion**

We have audited the accompanying financial statements of SmartCrete CRC Ltd ('the Company'), which comprises the statement of financial position as at 30 June 2021, the statement of profit or loss and other comprehensive income, the statement of changes in equity and the statement of cash flows for the period from 16 June 2020 to 30 June 2021, and notes to the financial statements, including a summary of significant accounting policies, and the directors' declaration.

In our opinion, the accompanying financial statements of SmartCrete CRC Ltd have been prepared in accordance with the *Division 60 of the Australian Charities and Not-for-profits Commission Act 2012*, including:

- (i) giving a true and fair view of the Company's financial position as at 30 June 2021 and of its financial performance for the period from 16 June 2020 to 30 June 2021; and
- (ii) complying with *Australian Accounting Standards - Simplified Disclosures* and Division 60 of the *Australian Charities and Not-for-profits Commission Regulation 2013*.

**Basis for Opinion**

We conducted our audit in accordance with Australian Auditing Standards. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Report* section of our report. We are independent of the Company in accordance with the ethical requirements of the Accounting Professional and Ethical Standards Board's APES 110 *Code of Ethics for Professional Accountants (including independence standards)* (the Code) that are relevant to our audit of the financial report in Australia. We have also fulfilled our other ethical responsibilities in accordance with the Code.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

**Responsibilities of Directors for the Financial Report**

The directors of the Company are responsible for the preparation of the financial statements that gives a true and fair view in accordance with *Australian Accounting Standards – Simplified Disclosures* and the *Australian Charities and Not-for-profits Commission Act 2012* and for such internal control as the directors determine is necessary to enable the preparation of the financial statements that gives a true and fair view and is free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the directors are responsible for assessing the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the directors either intend to liquidate the entity or to cease operations, or have no realistic alternative but to do so.

The directors are responsible for overseeing the Company's financial reporting process.



SmartCrete CRC Ltd

## Independent Auditor's Report to the Members of SmartCrete CRC Ltd

### Auditor's Responsibilities for the Audit of the Financial Report

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole is free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Australian Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the financial statements.

A further description of our responsibilities for the audit of the financial report is located at the Auditing and Assurance Standards Board website at: <http://www.auasb.gov.au/Home.aspx>. This description forms part of our auditor's report.

A handwritten signature in blue ink, appearing to read 'Rupaninga Dharmasiri', is positioned above the printed name.

Rupaninga Dharmasiri  
Partner

LBW & Partners  
Chartered Accountants  
Level 3, 845 Pacific Highway  
CHATSWOOD NSW 2067

Dated this 23rd day of September 2021

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