



FINAL REPORT



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CONFIDENTIAL:

☐ Yes ☒ No

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Industry Partners

- Holmesglen Institute
- AG Coombs
- Lendlease Digital
- Sumitomo Forestry Australia
- Building and Plumbing Commission
- Master Builders Association Victoria
- Fleetwood

Research Partners

- B40CRC
- Monash University
- University Of Melbourne

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1. EXECUTIVE SUMMARY

Project #66, *Future of Construction Education*, is a comprehensive initiative designed to transform construction training and higher education by addressing critical industry skills gaps. Central to the project is the development of a new three-year **Bachelor of Digital Construction and Management** at Holmesglen Institute (Melbourne), equipping graduates with advanced digital, sustainable, and industrialised construction capabilities.

The detailed project methodology outlined herein includes context benchmarking, degree mechanics, and the establishment of a broader educational framework aimed at evolving the Australian construction and design workforce for readiness in “Industry 4.0” building work. This research examines market competition, educational pathways, and accreditation processes including alignment to the Australian Qualifications Framework Level 7 (AQF7) and the Tertiary Education Quality and Standards Agency (TEQSA) national accrediting body. The course content was informed by international insights, industry partnerships, and contemporary pedagogical approaches. The research project proposes the development of future microcredentials that can be leveraged from the bachelor’s degree, and outlines plans for ongoing research and further work of sector relevance.

The project seeks to close the gap between emerging capabilities, skills, and approaches needed to successfully deliver Modern Methods of Construction (MMC) in education across construction management, building surveying, design, and skilled trades.

Critical Issues address

Project #66 addresses several critical challenges currently confronting the construction industry. Foremost is a significant skills gap in emerging technologies such as digital modelling, data analysis, automation, and sustainability. The slow adoption of prefabrication, digitalisation, and automation in Australia is further hindered by gaps in training, certification, regulation, manufacturing, supply chain management, and accreditation. There is an urgent need for new programs and educational approaches that can resolve these shortages and support the transition to a technology-based industry characterised by greater diversity and flexibility. At present, education in construction management, building surveying, design, and the skilled trades lag behind the demands of new technologies and paradigms. Addressing these issues through innovative education programs is essential to closing the skills gap and ensuring the sector remains competitive and future-ready.

Key Findings and Outcomes

The key findings and outcomes of this project include:

- Development of a new **Bachelor of Digital Construction and Management** degree program. This 3-year full-time degree, developed in collaboration with Holmesglen Institute, is designed to close the gap at the Australian Qualifications Framework (AQF) Level 7. It offers innovative education that integrates applied learning, knowledge management, and industry-relevant applications. This degree is a first-of-its-kind for Australia, and commenced enrolments in April 2026.
- The program's structure is designed for flexibility and adaptability, offering six clusters focused on high-demand technical skills not currently provided as a single course by competitors. Industry partners will be actively involved in course delivery through authentic assessments and guest lectures.
- The curriculum is collaboratively crafted with industry leaders to align with current sector demands, highlighting digitalisation, Industry 4.0 principles, and innovation in product development. It features applied learning experiences, including industry-specific challenges, projects, and simulations.
- Graduates of the degree will possess a comprehensive skill set, encompassing technical proficiency in digital technologies and industrialised construction, alongside vital soft skills such as critical thinking, problem-solving, innovation, resilience, and ethical judgment. This blend prepares them for immediate employment and leadership.
- The delivery approach ensures maximum access and flexibility through a hybrid model, accommodating full-time and part-time students, with on-campus, remote, and mixed delivery options supported by an online learning platform.
- The course name, *Bachelor of Digital Construction and Management*, was chosen to align with recruitment strategies, emphasise digital skills, and clearly define career and employment opportunities.
- Specific subject modules *Introduction to Design and Construction in the Digital Age* and *Fundamentals of Building Information Modelling (BIM)* were expanded and delivered.
- The project delivered a design studio in the Master of Architecture program at Monash University Faculty of Art, Architecture, and Design (MADA) to test future of work scenarios.
- The project findings have fed into future Building 4.0 CRC projects, including Project #95 The Homes NSW MMC Program, #102 Skills and Training Implications of MMC, #111 VET Qualifications System and Training Framework for MMC, and #120 MMC Microcredentials.
- An actionable framework for education transformation in construction and higher education was developed to guide future education initiatives.

Recommendations

This report outlines several key recommendations and future steps to advance construction education in Australia.

- Launching the new Bachelor of Digital Construction and Management degree, with commencement in Semester 1 (2027) having received TEQSA approval.
- Further research to investigate skills gaps, microcredentials development, and industry-educational sector connectivity. The program is positioned to offer microcredentials based on its subject streams, addressing immediate industry needs.
- Implementing a broader program development and framework that provides a vision and roadmap for education transformation. This framework titled, *The Future of Construction Education Network Map*, emphasises educational journey mapped with multiple entry and exit points, strong pathways to industry, multi-modal flexible learning and postgraduate alternatives.
- Key strategies within this framework include developing a lifelong learning industry pathway that includes a stackable curriculum, establishing clear established career pathways, embedding work placements and industry collaboration.
- Developing policy briefings for dissemination through various industry channels to maintain relevance and broaden the project's impact.

Project #66 The Future of Construction Education aims to build a future-ready workforce for the Australian construction sector, proactively addressing current skill shortages and adapting to emerging technologies and evolving industry demands.

2. PROJECT OVERVIEW

Project Agenda: To close the gap between capabilities, skills, and approaches in Modern Methods of Construction (MMC) education across construction management, building surveying, design and skilled trades.

PROJECT #66	
FUTURE OF CONSTRUCTION EDUCATION	
Objectives	Deliverables
1. Develop and gain approval for a new bachelor's degree program in Future of Construction at Holmesglen Institute 2. Develop a framework for education that contextualises the bachelor's as a 'foundation' within a schema from Diploma level through to post-professional masters 3. Establish the gaps in knowledge and education for Australia with benchmarking against global best practice	1. New Degree Program. Develop a comprehensive degree program developed as per requirements of TEQSA to the level of approval for delivery as a commercial viable degree program at <u>Holmesglen Institute</u>. 2. Subject Matter Modules. Design and introduce pilot modules that delve into specific subject matters 3. Framework Document/Guidelines. Formulate a clear and actionable framework document that provides a vision and roadmap for education transformation in the Australian construction sector and higher education landscape. 4. Scholarly Outputs and Dissemination. Produce scholarly and conference papers, detailing the research process, findings, and recommendations.

Introduction

As new paradigms and technologies continue to transform building design and delivery, a widening gap is emerging between the capabilities, skills and educational approaches in construction management and the skilled trades. Research underscores a growing demand for competencies in digital modelling, data analysis, and automation implementation.

Additionally, as the construction industry shifts towards greater adoption of industrialised prefabricated housing solutions and Modern Methods of Construction (MMC), it faces a shortage of skilled workers. There are limited educational opportunities for workforce upskilling in MMC. Compared to international standards, Australia's MMC industry is still maturing and remains susceptible to inertia due to limited access to digitally skilled professionals in construction management.

Background

BuildSkills Australia reports that the Australian construction industry faces a severe structural labour shortage, requiring an additional 116,770 residential construction workers by 2029 to meet the National Housing Accord target of 1.2 million homes. (BuildSkills Australia. 2025b). By 2028, the overall sector workforce gap is projected to reach 22% (BuildSkills Australia. 2025a). To ease these workforce pressures, BuildSkills emphasises that the adoption of Modern Methods of

Construction (MMC) and digital technologies is vital, noting that a 5% boost in productivity through innovation is equivalent to adding 30,000 workers to the residential sector (Productivity Commission, 2025).

A lack of capability and educational frameworks that fail to teach digital fluency, prefabrication and systems integration is restricting progress. Persistent skills gaps remain in areas critical to MMC adoption, such as digital engineering and automation, BIM, robotics, advanced materials and industrialised approaches to construction. Holmesglen Institute's Bachelor of Digital Construction and Management directly targets these documented workforce shortages by preparing job-ready graduates skilled in Industry 4.0 principles, digital workflows and advanced offsite construction methods. Core subjects including DfMA and Prefabrication Techniques (BDCM202), BIM Management and Processes (BDCM205) and Optimised Production and Assembly in Construction (BDCM206) qualify graduates for critical emerging roles such as prefabrication construction specialists, BIM coordinators and construction technologists. The course will develop the digital and construction management talent required for scaling MMC and lifting national construction productivity.

In Australia, a range of emerging construction industry players are delivering projects using prefabrication, digitalisation and automation (Master Builders Australia, 2023). Traditional trade skills are increasingly being complemented by new capabilities in manufacturing processes and digital technologies (prefabAUS, 2023). At the tertiary level, competencies in construction technology, collaboration and technological integration are becoming essential. While skills, knowledge, and competency in emerging technical areas are in high demand, recognised education pathways at all levels have yet to be established (Victorian Skills Authority, 2022).

Additionally, rapid career progression without adequate training, experience, coaching and mentoring poses a significant risk to the construction industry. As the sector continues to evolve towards adopting MMC, the gap between initial training, formal education and continuing education is widening, further exacerbating the shortage of skilled professionals, both now and into the future. This growing knowledge gap extends to key areas such as certification, regulation, manufacturing, supply chain management and accreditation (Correia et al., 2023). To address these challenges and mitigate the skills shortage, innovative educational approaches and programs are urgently required (Assaad et al., 2022). Higher education has the potential to support a technology-based industry by adding diversity and offering great flexibility.

Growth Areas

There is a significant and emerging growth in demand for professionals skilled in digital technologies, including Building Information Modelling (BIM), automation and industrialisation in construction processes and sustainable construction practices (Australian Constructors Association, 2023). These skills are crucial for advancing green building practices and delivering affordable housing. The future construction industry will require professionals who are not only technically proficient but also capable of managing complex projects that integrate sustainability and digital innovation. Future industry leaders will need the knowledge and capacity to adapt to evolving technologies and work processes.

Project #66 and Holmesglen Institute

Building 4.0 CRC, Monash University and the University of Melbourne in collaboration with Holmesglen Institute formed the research team for Project #66 aimed at developing a new digital, forward-focus bachelor's degree. This initiative seeks to address a recognised gap in the construction industry's academic pathway. The creation of this new degree is one of the project's primary outcomes.

Methodology

Structure

This study investigates the future of the construction industry through three streams:

- Stream 1: Context Benchmarking and Content
- Stream 2: Degree Mechanics
- Stream 3: Broader Program Development / Framework.

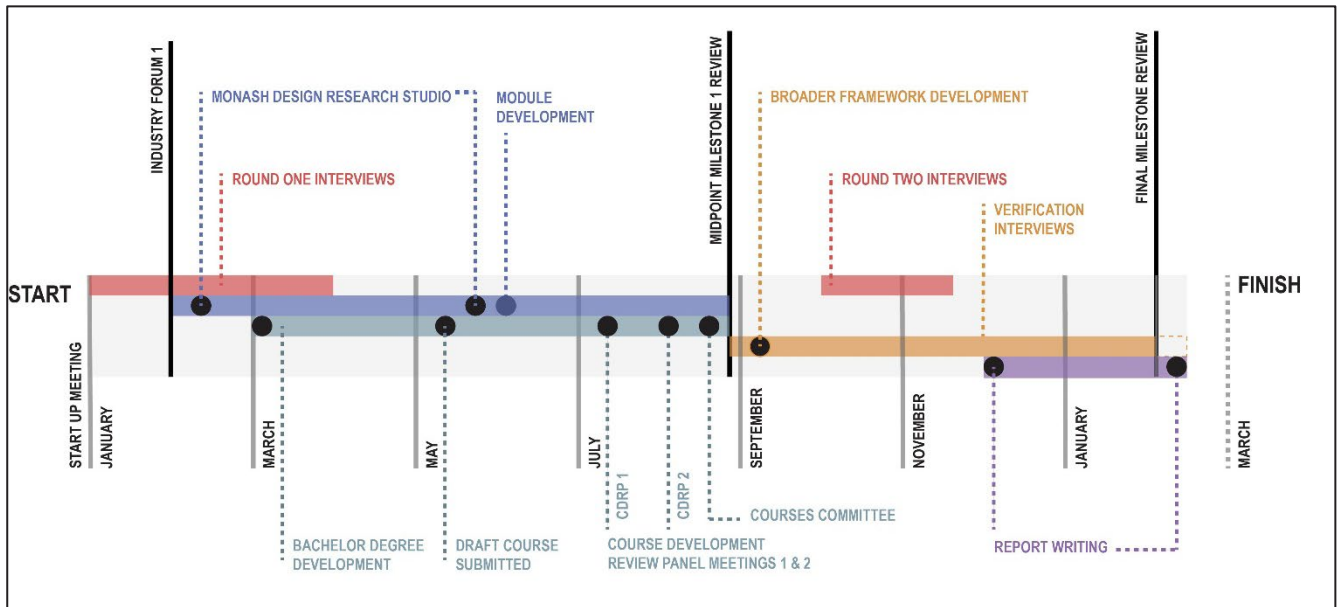


Figure 1. Interaction of three streams in Project #66

Research Methodology: Stream 1

The approach of Stream 1 was to establish the background context and analyse the gaps in digital literacy education and Modern Methods of Construction (MMC) within the construction industry. The research focused on forecasting skills and job demands over the coming decade to ensure a proactive, rather than reactive, approach to addressing skills gaps. The methodology of Stream 1 involved conducting the following research:

Stakeholder Engagement and Market Analysis: Conduct semi-structured interviews, host industry partner forums, engage with Holmesglen Institute to establish their requirements, survey current workforce participants and analyse Australian construction management course offerings.

Pedagogical Approaches: Explore teaching strategies that cultivate agility and adaptability, with an emphasis on preparing students for emerging skills and industry challenges. Investigate existing models that promote flexible learning and adaptability.

International Benchmarking: Integrate international perspectives, drawing inspiration from international courses and the expertise of thought leaders such as Dr Jerker Lessing.

Data-Driven Insights: Provide insights on recruiting trends and role specifications. Consult government data and labour market lists highlighting in-demand occupations.

Future-Proofing the Construction Professional: Identify emerging technologies, competencies and practices relevant to the field. Understand and preserve the foundational essence, or "the anchor", of traditional construction, while strategically integrating it with

contemporary methodologies. Design a degree program that accommodates both traditional and future construction paradigms.

Integration with CRC Research Outcomes: Incorporate findings from Building 4.0 CRC research projects to ensure a holistic and informed approach to curriculum development.

Degree Methodology: Stream 2

The bachelor's degree developed in Stream 2 addresses the educational needs at the Australian Qualifications Framework Level 7 (AQF Level 7). Graduates at this level are expected to possess broad and coherent knowledge and skills for professional practices or further learning.

Stream 1's research laid the foundation for the development of the new future-focused bachelor's degree, which is the central objective of Stream 2. By identifying critical skills and referencing international course benchmarks, several study areas were selected to shape the structure of the program. These study areas, organised into thematic "Clusters" that form vertical streams within the course, include:

- Construction and Technology
- Industrialisation
- Materials and Sustainability
- Project Management and Building Information Management (BIM)
- Legal, Financial and Safety
- Specialised Advanced Topics.

Additionally, a range of skills and subjects were identified and incorporated as matrix elements within each stream.

- Sustainability
- Industrial relations
- Design Logic
- Interpersonal skills
- Industry connection
- Ethics.

Framework Methodology: Stream 3

After identifying gaps in MMC and digital knowledge at all educational levels, it is acknowledged that additional educational options and pathways are urgently needed to support industry change. The Framework or Network Map established in Stream 3 contextualises the system's complexity and pinpoints where new educational resources are required. It serves as a guide to the connections and pathways into and beyond the bachelor's degree. Filling in these gaps and connecting the educational pathways by developing educational opportunities in industrialisation and digital construction is critical to efficiently supporting the supply chain necessary to address the current housing affordability crisis.

3. STREAM 1: CONTEXT, BENCHMARKING AND CONTENT

Establish the gaps in knowledge and education for Australia with benchmarking against global best practice.

Introduction

Stream 1 established the project's foundation through stakeholder engagement and market analysis. It researched the background context and identified gaps in digital literacy and MMC education within the construction industry. It adopted a forward-looking approach by forecasting skills and workforce demands over the next decade to proactively address emerging gaps. T

Overview of literature review

The literature review provides global and national insights into the future of construction education and workforce needs.

Global Insights

Global Insights were gained from the World Economic Forum's *The Future of Jobs Report* (2023), which provided a global perspective on future job projections. The report is based on a survey of 803 companies employing over 11.3 million workers across 27 industry clusters and 45 economies. The report outlines:

- **Net job creation** will be driven in part by investments facilitating green business transitions and strengthened by the broader application of ESG (Environmental, Social and Governance) standards.
- **Technological advancements** will drive the increased adoption of emerging technologies and digital accessibility, driving job growth in more than half of the surveyed companies. Additionally, big data, cloud computing and AI are expected to be adopted by more than 75% of companies within the next five years.
- **Analytical and creative thinking** remain essential skills for workers in 2023 and beyond. These abilities are essential for problem-solving, innovation, and adapting to evolving workplace demands.
- **Dependability and attention to detail** were rank sixth among important skills, while **technological literacy** remains essential. Additionally, **empathy, active listening, leadership, and social influence** are key, with **quality control** recognised as a significant skill.
- **Manual dexterity, endurance, and precision** are skills of declining importance for future workers.

Between 2023 and 2027, skills training priorities will focus on enhancing critical competencies in response to evolving workplace demands. Analytical thinking ranks as the highest priority, representing 10% of upskilling initiatives. Following closely, creative thinking ranks second, with 8% of training efforts dedicated to strengthening innovation skills. In addition, training in artificial intelligence and big data has emerged as a strategic area, with 42% of surveyed companies planning to emphasise these technological advancements in their workforce development strategies.

UK Construction Industry Insights

The CITB *Skills and Training in the Construction Industry 2021* Research Report provides an in-depth analysis of the skill needs and training practices in UK Construction industry. The study was conducted across 1,218 respondents including 1,092 employers and 126 self-employed individuals. Over a third of the employers reported skills gaps with the most common deficiencies in job specific trade skills and National Vocational Qualifications (NVQ). The most significant drivers of new skills and knowledge was identified as increasing competitive pressure, followed by new legislation or regulatory requirements. A new factor introduced in the 2021 report was the growing use of Modern Methods of Construction (MMC).

National Digital Skills Insights

The Australian Government's National Skills Commission report, *The Digital Skills in the Australian and International Economies* (2020-2021) outlines that digital skills are among the fastest growing in the Australian economy and are expected to increase by up to 5% over the next five years from 2021. This expected growth is wide ranging across occupations and not limited to ICT roles. The rising demand for digital skills is leading to the creation of new occupations such as data scientists and data engineers, which were not previously classified in the Australian occupational system. Additionally, digital skills such as data analysis are becoming essential across all occupations and are no longer confined to the IT sector.

National Prefabrication Insights

PrefabAUS' publication, *A Prefabrication Industry Roadmap 2023-2033* and the Australian Productivity Commission's *Nailing Construction Productivity* provide further insights into the challenges facing the Australian construction industry. Traditional trade skills will be augmented with new capabilities in manufacturing processes and digital technologies. As distinct trades increasingly overlap, a more versatile workforce will emerge, capable of performing tasks previously restricted to specific trades. Emerging prefabrication technologies will enhance, rather than diminish, the role of existing trades by integrating digital skills. It is envisioned that digitally enabled workers will carry out basic electrical and plumbing tasks necessary for production continuity, while fully accredited tradespeople will continue to ensure quality assurance. As technology drives productivity improvements, new job families will emerge. Employers will expect the future workforce to be equipped to operate in a data rich environment. Future construction jobs are more likely to require skill sets that emphasise cognitive and digital capabilities rather than physical attributes such as strength, endurance, and coordination.

National Workforce Insights

Master Builders Victoria's *Future Proofing Construction: A Workforce Blueprint*. (2023) outlines workforce needs. The Australian construction industry requires approximately half a million workers by November 2026, primarily to replace those exiting the industry annually. Critical shortages exist across many construction occupations, with significant demand for roles such as construction managers, carpenters, plumbers, and labourers. Construction work is increasingly specialising, integrating technology, and navigating complex regulatory requirements. This shift necessitates flexible and future training and education systems to equip workers with the necessary skills. The report outlines policy priorities for attracting, recruiting, and retaining workers, with a focus on improving gender diversity, enhancing career education, leveraging migration, and reforming vocational education and training (VET) systems. Additionally, the report emphasises the importance of apprenticeships, highlighting recruitment challenges and the need for improved careers paths and pathways to further education.

National Skills Building and Construction Industry Insights

The Victorian Skills Authority's *Victoria Skills Plan: Construction Industry Insights* (2022) highlights the need to strengthen industry pathways from apprentices to supervisors and through to management. Additionally, it identifies gaps in pathways for developing technical expertise in high

demand areas. Rapid career progression without adequate experience, coaching or mentoring is cited as concern. Expanding opportunities for prospective entrants requires a broader range of pathways. In 2020, VET-level enrolments were heavily concentrated in just seven courses, underscoring the challenge of attracting a skilled workforce across diverse trades. Strengthening collaboration between industry and education providers is essential to enhancing student experiences and increasing apprenticeship completion rates. The report emphasises the importance of fostering a more inclusive construction industry, particularly for women and individuals from diverse cultural backgrounds.

Table 6 | Emerging occupations in the construction industry⁸³

Emerging occupations	
• Energy auditors	• Energy efficiency engineers
• Hazardous materials labourers	• Regulatory affairs specialists
• Risks analysts	• Solar installers
• Tunnelers	• Wind turbine technicians

Table 8 | Skill shortages facing the construction industry^{109,110}

Skill shortages	
• Customer service	• Business management and/or financial management skills ¹¹¹
• Commercial management ¹¹²	• Design and estimation ¹¹³
• Digital skills (e.g., working with digital devices, communication applications and networks)	• Emerging renewable construction (hydro, digital, electricians)
• Fault fixing capability	• Foundation skills (e.g., language, literacy and numeracy skills)
• Initiative	• Innovation
• Management and supervision skills	• Problem-solving
• Procurement management ¹¹⁴	• Teamwork

Figure 2. Emerging occupations and skills shortages in construction

Source: Victorian Skills Authority (2022). [Victorian Skills Plan](#), Extract Table 6 and Table 8.

Offsite Construction Related Skills

Offsite Construction Related Skills included design and engineering, construction and fabrication, administrative, fabrication package creation and detailing, manufacturing and factory knowledge, offsite construction philosophy, systems thinking and integration, process streamlining, and personal information systems.

OFFSITE CONSTRUCTION RELATED SKILLS		
....to be included in training programs		
1. Design and Engineering	2. Construction and Fabrication	3. Administrative
• Fabrication package creation and detailing • Stability and constructability of components and modules • Supply chain and procurement • Logistics and transportation • Offsite construction philosophy • Design for manufacturing and assembly (DfMA) • Design freeze • Offsite typologies	• Automation, robotics, and computer-automated technologies • Placement, assembly, and installation • Manufacturing and fabrication processes • Operation management and process planning • Good manufacturing practices (GMP) • Integration of onsite and offsite activities • Offsite construction philosophy	• Manufacturing and factory knowledge • Offsite construction philosophy • Systems thinking and integration • Process streamlining • Personnel information systems

Figure 3. Summary of Offsite Construction Related Skills

Source: Assaad, et al. (2022). "[The impact of offsite construction on the workforce: Required skillset and prioritization of training needs.](#)" *Journal of Construction Engineering and Management*. 148(7): 04022056.

Stakeholder Engagement and Market Analysis

Stakeholder engagement included a series of semi-structured interviews (Attachment 1), industry partner forums and collaboration with Holmesglen Institute to establish their requirements. Additionally, a survey was conducted among current workforce participants, and a market analysis of Australian construction management courses was undertaken. (Attachment 2)

Semi-Structured Interviews

As part of this research project, 45-minute interviews were conducted with key stakeholders operating in the Architecture, Engineering, and Construction (AEC) Industry value chain and the ACE education sector. Interviews were used to uncover the specific industry needs and educational deficiencies that a new bachelor's degree program in the 'Future of Construction' must address. Interviewers were chosen as their body of work represents a case for illustrating the change from traditional work approaches to modern design and construction methods. Semi-structured interviews were carried out across various interviewee categories, including Industry Professionals, Academics, Industry Peak Bodies, Technology Innovators, Sustainability Professionals, Labour Representatives, Clients, and Thought Leaders, outlined as:

Industry Professionals included Construction Managers, Structural Engineers, Architects, BIM managers and Quantity Surveyors who provided practical perspectives on what skills and knowledge are required.

Academics and researchers who offered insights into the latest trends, technologies and academic findings relevant to MMC and the construction industry

Industry Peak Bodies for insights into future regulatory changes, codes and standards that will impact construction

Technology Innovators such as construction tech start-ups, founders and DfMA in construction experts. As the construction industry incorporates MMC technology, these innovators can provide insights into the future of construction technology.

Sustainability, Circular, Supply Chain Professionals who provided insights into green building techniques, materials and certifications.

Labour Representatives from MBAV and construction trades who provided insights into worker needs, training requirements and trends in the workforce.

Clients and developers, including those who commission construction projects who provided a viewpoint on construction teams, emphasising interpersonal skills and knowledge areas.

Thought Leaders whose experience in breakthrough innovation in the industry can guide the pedagogical aspect of the new course structure, ensuring its engaging and effective.

Interview Analysis

A copy of the semi- structured interview questions is included in Attachment 1. The Interview Summary highlighted several key areas for curriculum development:

- **Curriculum Integration:** Emphasising a holistic approach, a dedicated sustainability stream, proficiency in digital tools (AI, BIM), and interdisciplinary collaboration through co-design projects.
- **Industry Partnerships and Practical Experience:** Partnering with leading firms for course design, guest lectures, structured internships, and real-world projects focused on sustainability and innovative construction.
- **Specialisation and Flexibility:** Offering specialised streams (digital construction, project management, sustainability, DFMA) and flexible pathways including apprenticeships and certifications.
- **Interpersonal Skills and Leadership:** Developing soft skills like leadership, communication, decision-making, and effective stakeholder management.
- **Continuous Learning and Adaptation:** Designing a curriculum that adapts to emerging trends, appointing a faculty lead for currency, and implementing an iterative course design.
- **Evaluation and Feedback:** Regularly seeking feedback from industry and students and embedding modules on ethical practices and sustainability metrics.
- **Technological Integration:** Covering emerging technologies such as 3D printing, bio-based materials, and prefabrication methods, using case studies to illustrate practical application

Table 1. Summary of Semi-formal interviews

<i>Interview Summary</i>			
Curriculum Integration			
Holistic Approach	Sustainability Stream	Digital Skills	Interdisciplinary Collaboration
Integrate traditional construction management with emerging trends like sustainability, digital tools, and modern construction techniques.	Include a dedicated sustainability stream with modules on embodied carbon, low-carbon materials, climate resilience, and sustainable procurement.	Ensure proficiency in digital tools, AI applications, and BIM, emphasising practical applications and problem-solving skills.	Promote co-design projects with engineers, planners, and other stakeholders to foster interdisciplinary learning and collaboration.
Industry Partnerships and Practical Experience			
Industry Collaboration	Guest Lectures and Workshops	Internships and Co-op Programs	Real-World Projects
Partner with leading construction firms, manufacturers, and industry bodies to design and deliver courses.	Incorporate regular guest lectures and workshops by industry professionals to keep the curriculum relevant and up-to-date.	Offer structured internships and co-op programs to provide hands-on experience and bridge the gap between theory and practice.	Integrate practical projects and case studies based on real-world challenges, focusing on sustainability, innovative construction methods, and stakeholder engagement.
Specialisation and Flexibility		Interpersonal Skills and Leadership	
Specialised Streams	Flexible Pathways	Human Behavioural Skills	Stakeholder Management
Offer specialised streams within the construction management degree, such as digital construction, project management, sustainability, and DfMA.	Provide flexible pathways for students to tailor their education according to their interests and career goals, including options for apprenticeships and certifications.	Emphasise the development of soft skills, including leadership, communication, and decision-making abilities.	Teach effective stakeholder management and community engagement, highlighting the importance of aligning with community expectations and regulatory requirements.
Continuous Learning and Adaptation			
Ongoing Relevance	Champion for Future Trends	Iterative Course Design	
Design the curriculum to adapt continuously to emerging trends and technologies, ensuring that graduates are prepared for both current and future industry demands.	Appoint a dedicated faculty lead to stay abreast of industry trends, engage with industry bodies, and ensure the curriculum remains cutting-edge.	Implement an iterative approach to course design, allowing for adjustments based on feedback from industry partners and technological advancements.	
Evaluation and Feedback		Sustainability and Ethics	
Industry Feedback	Student Feedback	Ethical Practices	Sustainability Metrics
Regularly seek feedback from industry partners on the curriculum and student performance to ensure alignment with industry needs.	Collect and incorporate student feedback to improve the learning experience and address any gaps in the curriculum.	Embed modules on modern slavery, ethical sourcing, and regulatory compliance within the curriculum.	Teach students how to measure and manage sustainability metrics, including carbon accounting and lifecycle assessment of materials.
Technological Integration			
Emerging Technologies	Case Studies		
Cover emerging technologies such as 3D printing, bio-based materials, and prefabrication methods.	Use case studies of innovative projects (e.g., Atlassian Tower, Kete Quarter Tower) to illustrate the practical application of these technologies.		

Survey Analysis: Construction Career Pathways and Educational Needs

Six senior professionals from industry, academia, and regulatory bodies participated in a comprehensive survey exploring career trajectories, skill development, technology adoption, and future workforce needs. Participants reported between three and 31 years of experience (mean 16.3 years) and held qualifications in fields such as architecture, engineering, environmental science, and professional learning and development.

Three core themes emerged: (1) convergence on experiential learning models with career-stage differentiation; (2) technology trifecta integrating prefabrication, sustainability, and digitalisation; and (3) a collaboration paradox whereby industry and academia strongly value partnerships while regulators and innovation specialists remain neutral.

Strategic imperatives include rebalancing workforce supply between trades and professional roles, embedding work-integrated learning throughout curricula, and anticipating demographic shifts affecting labour supply and housing demand. Educational transformation requires modular credentials, tiered learning pathways, experiential hubs, and formalised cross-sector collaboration.

To support survey participants in reflecting on their own professional journeys, the research team developed and shared four illustrative career exemplars. These examples were designed to prompt consideration of diverse pathways within the construction sector, spanning both traditional and emerging roles. The examples included: (1) Traditional Pathway: Project Management, (2) Alternative Pathway: Construction Labourer to Digital Construction Manager, (3) Digital Construction Specialist, and (4) Architecture to Sustainability Specialist. Each scenario demonstrated how evolving technologies, sustainability imperatives, and interdisciplinary skills are reshaping professional identities and opportunities across the built environment.



Figure 4. Four illustrative career exemplars developed by the project team to illustrate career protectories

Research Context

The construction industry faces transformational pressures from digitalisation, sustainability mandates, and demographic shifts. To inform educational program design and workforce strategy, this survey engaged six senior professionals across industry organisations, academic institutions, and regulatory agencies. Participants provided insights into career development strategies, learning preferences, technology priorities, collaboration attitudes, and future trends.

This report presents a comprehensive analysis of survey responses, synthesises core themes and workforce insights, and proposes a strategic roadmap for construction education aligned with modern methods of construction (MMC), sustainability imperatives, and digital innovation.

Survey Analysis

Demographics

Respondents occupy diverse senior roles: a national business development manager, an associate professor, a principal adviser, a technical adviser in sustainable environments, a head of innovation and design, and an L&D business partner. Two work at a major construction manufacturer; others represent an industry association, a timber construction company, a research-intensive university, and a state building regulator.

Experience spans from three years to over thirty years, and educational backgrounds include architecture, mechanical engineering, environmental science, and learning development. All are based in Victoria.

Career Development Pathways

All respondents identified gaining experience through various roles as fundamental to career progression. Five of six pursued advanced education, assumed leadership responsibilities, and engaged in innovative projects. Networking and industry connections shaped the careers of four respondents, while relocation for career opportunities featured prominently for those transitioning between sectors or advancing into senior positions.

One respondent explicitly noted that the Global Financial Crisis prompted an industry shift from hospitality and media into construction design management, illustrating how external economic disruptions can catalyse career pivots. Another traced a trajectory from manufacturing engineering through client-side construction involvement into academic research, demonstrating cross-industry knowledge transfer pathways.

Educational Credentials and Continuous Learning

University degree programs remain universally valued, with all respondents crediting formal qualifications as career foundations. Half also relied on vocational education and training, on-the-job learning, professional certifications, and continuing professional development. Mentorship and coaching supported career advancement for four respondents, particularly during transitions into leadership or specialist advisory roles.

When asked about ongoing adaptation, respondents reported active engagement with modular credentials: four confirmed that microcredential models could have accelerated career progression, while two indicated uncertainty. This reflects growing recognition that targeted, stackable qualifications can complement traditional degrees by addressing specific skill gaps in emerging technologies and methodologies.

Technology and Education Priorities

Prefabrication and modular construction attracted the strongest interest (five of six respondents), signalling industry momentum toward off-site manufacturing. Sustainable and green building techniques, off-site and panelised construction, and smart building technologies each drew five respondents, underscoring convergence between environmental imperatives and digital innovation.

Building Information Modelling (BIM) engaged three respondents—those in digital leadership, academic, and regulatory roles—reflecting BIM's maturation from emerging tool to established practice requiring specialist expertise. Rapid construction techniques and modular housing solutions each interested four respondents, particularly those focused on residential development and scalable delivery models.

3D printing in construction and advanced materials drew interest from two respondents, suggesting these remain niche specialisations rather than mainstream priorities. Similarly, construction robotics and automation appealed to two, indicating cautious exploration rather than widespread adoption readiness.

Four respondents reported that technology improved project management and scheduling, enhanced communication and collaboration, and increased BIM adoption. Two noted impacts from prefabrication and modular construction methods, efficiency gains, and facilitation of remote work. These patterns reflect a dual technology trajectory: widespread digital coordination tools alongside selective adoption of physical automation.

Industry Collaboration

Three respondents rated industry collaboration (internships, work placements, partnerships) as "very important" for education, while three expressed neutrality. Significantly, all industry and academic respondents strongly endorsed collaboration, whereas regulatory and innovation-focused specialists held neutral views.

This divergence likely reflects differing organisational priorities: industry employers and universities directly benefit from work-integrated learning pipelines, while regulators focus on compliance competency and innovation leads emphasise internal capability development. One respondent explicitly stated that construction education must be experiential—"you learn by doing and experiencing"—underscoring practitioner conviction that classroom instruction alone inadequately prepares graduates.

Career Challenges and Achievements

Challenges

Three respondents identified navigating regulatory compliance, addressing workforce shortages, and overcoming safety and health issues as major challenges. Two faced technological adaptation hurdles. Regulatory compliance challenges emerged across industry, academic, and regulatory roles, indicating systemic complexity in keeping pace with evolving codes and standards.

Workforce shortages concerned those in large-scale project delivery and organisational development roles. One senior manager noted a disproportionate workforce supply favouring consulting and engineering over trades, advocating for modern methods of construction (MMC) capacity expansion while maintaining traditional training pathways to meet projected demand.

Achievements

Four respondents took pride in implementing innovative solutions or technologies, while three highlighted leadership in major projects or initiatives and contributions to sustainability and green building practices. Innovation achievements spanned digital tool adoption, sustainable material specifications, and process optimisations reflecting productivity gains.

Leadership achievements centred on guiding organisational transformations, managing cross-functional teams, and delivering complex infrastructure or housing projects. Sustainability contributions ranged from environmental management planning to embedding circular economy principles in construction operations.

Emerging Trends Shaping Future Careers

Four respondents identified digitalisation and technology (AI, machine learning, BIM, digital twins, IoT, robotics) as the dominant trend. Three selected sustainability and environmental practices (sustainable materials, waste reduction, circular economy, energy efficiency) and people, culture, and work practices (diversity, safety, change management, future of work).

Two respondents each emphasised innovative construction methods (prefabrication, modular construction, advanced manufacturing), business and market dynamics (business model innovation, risk management, contracts, finance), and policy, regulation, and compliance (regulatory change, environmental regulations).

One respondent specifically highlighted the "nexus and interaction between perceived infrastructure demand, ageing and declining population," pointing to demographic pressures reshaping workforce planning and housing typology requirements.

Three Core Themes

Insights

Supply-Demand Misalignment

One senior manager identified "disproportionate supply toward consulting and engineering relative to trades," advocating MMC capacity expansion while preserving traditional training. This signals:

- Immediate challenge: Trade workforce shortages constraining project delivery
- Strategic response: Scale MMC education to create new specialist roles (off-site manufacturing, modular coordination, digital fabrication)
- Risk management: Maintain traditional construction training to avoid over-correction and preserve on-site craft expertise

Demographic Pressures

One innovation leader highlighted "nexus between infrastructure demand, ageing/declining population," indicating:

- Labour supply constraints from population ageing
- Housing demand shifts requiring new typologies
- Infrastructure investment competing with workforce availability

Educational Transformation Roadmap

Immediate Priorities (0–2 years)

Modular Credentials: Deploy stackable microcredentials in prefabrication and DfMA, BIM and digital twins, embodied carbon and lifecycle assessment, and smart building systems.

Industry Partnerships: Formalise placements and co-teaching with construction employers (on-site and off-site facilities), academic institutions (research applications), and regulatory bodies (compliance integration).

Medium-Term Development (2–5 years)

Experiential Hubs: Establish off-site construction laboratories and pilot projects where students engage directly with modular manufacturing systems, digital fabrication technologies, and sustainability assessment tools.

Tiered Pathways: Design career-stage-appropriate formats: intensive apprenticeships and work-based learning (early-career) and hybrid executive education (mid-to-senior professionals).

Strategic Positioning (5+ years)

MMC Leadership: Position construction education as MMC capability driver, addressing workforce rebalancing (trades vs. professional roles), technology adoption acceleration, and sustainability transition enablement.

Cross-Sector Integration: Embed regulatory and policy perspectives throughout curricula via joint advisory panels, co-developed compliance modules, and placement schemes in regulatory bodies.

Three Strategic Imperatives

Rebalance Workforce Supply: Expand MMC-focused education creating new specialist roles, maintain traditional construction training preserving craft expertise, and develop dual-competency programs bridging conventional and MMC contexts.

Embed Experiential Learning: Design all programs around work-integrated learning core, co-locate educational facilities with industry partners, and structure assessments requiring real-world application.

Anticipate Demographic Shifts: Align curriculum with productivity-enhancing technologies (automation, prefabrication), address emerging typologies (aged care, accessible housing, urban intensification), and prepare workforce for smaller project teams leveraging digital tools.

Survey Recommendations

Modular and Stacked Credentials

Develop microcredentials, certificates, and diplomas in prefabrication, BIM, sustainable construction, and smart building technologies. Enable stacking into higher qualifications to support both early-career entrants and mid-career professionals seeking targeted upskilling.

Tiered Learning Pathways

Design intensive work-based learning and apprenticeships for early-career cohorts emphasising hands-on competency development. Offer hybrid executive education programs combining workshops, online modules, and classroom seminars for senior professionals focused on leadership, strategy, and regulatory insight.

Experiential Learning Hubs

Establish dedicated off-site construction laboratories, prefabrication facilities, and pilot project partnerships where students engage directly with modular systems, digital fabrication technologies, and sustainability assessment tools. Co-locate these hubs with industry partners to facilitate mentorship and real-world problem-solving.

Cross-Sector Collaboration Mechanisms

Formalise industry-academia-regulator partnerships through joint curriculum advisory panels ensuring alignment with industry needs and regulatory standards, co-teaching arrangements pairing practitioners, academics, and compliance specialists, placement schemes embedding students in regulatory bodies to develop policy fluency alongside technical skills, and collaborative research projects addressing workforce shortages, MMC adoption, and sustainability transitions.

Technology-Focused Curriculum Streams

Prioritise content in prefabrication and modular construction (comprehensive coverage of off-site manufacturing, design for manufacture and assembly, and supply chain integration), sustainable construction (embodied carbon, lifecycle assessment, circular economy principles, and green building rating tools), digital construction (BIM, digital twins, IoT, and project management platforms across all program levels), and smart building technologies (automation, sensor integration, and data-driven facility management).

Workforce Pipeline and Trades Balance

Address workforce supply imbalances by expanding MMC education to create new specialist roles in off-site manufacturing, modular systems coordination, and digital fabrication; maintaining robust traditional construction training pathways to preserve on-site craft expertise; developing dual-competency programs enabling individuals to operate across conventional and MMC contexts; and partnering with industry on targeted recruitment initiatives addressing identified shortages.

Survey Conclusion

This cohort of mid-to-senior construction professionals demonstrates strong alignment on core career development strategies (varied experience, advanced education, leadership, networking) and universal endorsement of formal qualifications complemented by modular credentials. Prefabrication, sustainability, and digital technologies dominate educational interests, reflecting industry transformation toward off-site manufacturing, environmental responsibility, and data-driven delivery.

Divergent perspectives on collaboration importance—with industry and academia strongly supportive while regulators and specialists remain neutral—highlight opportunities to deepen cross-sector partnerships through structured mechanisms that embed regulatory, policy, and compliance perspectives into educational programs.

Respondents' closing insights underscore three strategic imperatives: rebalancing workforce supply between trades and professional roles through MMC education, embedding experiential learning throughout curricula, and anticipating demographic shifts reshaping labour and infrastructure demand. Addressing these priorities through modular credentials, tiered learning pathways, experiential hubs, and formalised cross-sector collaboration will position construction education to prepare a future-ready workforce capable of navigating technological, environmental, and demographic transformations.

Detailed Case Study Exemplar

An anonymised case study illustrating emerging construction roles is provided below. This exemplar demonstrates how cross-industry experience (automotive to construction) informs new professional pathways in digital construction, modular systems, and sustainability.

Case Study: Cross-Industry Professional Transition

A senior industry professional's career illustrates emerging construction roles shaped by digital, modular, and sustainability imperatives. Early in their career they transitioned from hand-drawn automotive design to leading a shift toward 3D modelling and virtual testing—skills now critical for construction's digital transformation.

Five role archetypes emerge:

1. Digital Construction Engineer / BIM Specialist

Leverage 3D modelling, virtual prototyping, and data integration to optimise design coordination and project management workflows. Champion adoption of BIM platforms and digital-twin technologies to reduce rework and enhance collaboration across stakeholders.

2. Preconstruction Engineer / Modular Construction & DfMA Specialist

Apply Design for Manufacture and Assembly principles to streamline prefabrication, panelised systems, and modular housing production. Integrate manufacturing efficiencies into early design stages, reducing onsite labour and accelerating delivery timelines.

3. Technology Integration Manager / Construction Innovation Officer

Identify, pilot, and institutionalise emerging technologies (3D printing, AI, robotics) to maintain competitiveness. Oversee innovation roadmaps, fostering partnerships with tech vendors and R&D centres to embed digital tools and processes.

4. Virtual Design and Construction (VDC) Manager

Utilise virtual prototyping and simulation to detect constructability issues pre-construction, minimising risk and cost overruns. Coordinate cross-disciplinary teams within digital environments, ensuring seamless data handoffs from design to execution.

5. Sustainable Construction Manager / Energy Performance Consultant

Translate automotive efficiency methodologies into building projects, focusing on embodied carbon reduction, energy modelling, and lifecycle assessment. Develop and implement sustainability metrics, green procurement strategies, and performance reporting to meet evolving regulatory and client expectations.

Collectively, these roles reflect the fusion of digital innovation, prefabrication, and environmental stewardship shaping the future construction workforce.

Pedagogical Approaches

A review of pedagogical approaches sought to explore strategies for equipping students with agility and adaptability, ensuring they are well-prepared for emerging skills and challenges. It reviewed existing educational models that promote adaptability and responsiveness to evolving industry demands. Consideration was given to frameworks such as IMAC (Illustration, Manipulation, Application, Collaboration) and Kolb's Experiential Learning Theory; however, Bloom's Taxonomy, which integrates technical and interpersonal skills, hands-on experience, and a range of cognitive abilities, was adopted for the new degree due to it being the framework established at Holmesglen Institute.

IMAC Framework

IMAC is a framework integrating construction management and digital technology functions, developed to support construction management-specific digital technologies. Standing for Illustration, Manipulation, Application, and Collaboration, IMAC is designed to cultivate both

technical skills, such as IT and discipline-specific expertise, and interpersonal skills, including collaboration and teamwork.

Illustration	Manipulation	Application	Collaboration
The first stage of IMAC emphasises demonstrating and illustrating key concepts and techniques, providing students with a strong foundation for learning	In this stage, students actively engage with the tools and concepts introduced in the Illustration stage, applying them in practical scenarios	In the application stage, students put their knowledge into practice by applying what they've learned to real-world or simulated scenarios	The final stage involves students working together collaboratively, often in multidisciplinary teams, to achieve common goals.
In the context of AEC education, this could involve showing how BIM software works or illustrating the principles of integrated project delivery (IPD).	For instance, students might start using BIM software to manipulate simple models or modify existing designs.	In an AEC context, this could mean using BIM software to design a full project or collaborating on an IPD-based assignment.	In AEC education, this might involve different groups of students (e.g., architects, engineers, construction managers) collaborating on a comprehensive project using BIM tools.
This stage is critical for setting a foundational understanding upon which students can build. It's about exposing students to new ideas and tools in a straightforward and accessible manner.	The goal here is to provide a hands-on experience, allowing students to experiment with the tools and techniques they have just learned about. This stage is crucial for deepening understanding and fostering skills development.	The Application stage evaluates students' ability to apply their skills in practical, often complex scenarios, effectively bridging the gap between theoretical knowledge and real-world application	This stage is crucial for equipping students with the interpersonal skills essential for modern construction projects, including teamwork, communication, and problem-solving in a collaborative environment.

Kolb's Experimental Learning Theory.

Kolb's Experiential Learning Theory (ELT) is a widely recognised educational theory that emphasises the central role of experience in the learning process

Concrete Experience	Reflective Observation	Abstract Conceptualisation	Active Experimentation
The first stage emphasises demonstrating and illustrating key concepts and techniques to students, providing a strong foundation for student learning	At the next level, learners reflect on experiences, analysing what the student did, how they approached it, and the outcomes of their actions.	At this stage, learners use their reflections to generate new ideas or refine existing concepts	In the final stage, learners put their new ideas into practice, applying them to real-world scenarios to observe and evaluate the outcomes.
In a construction management bachelor's program, students can gain hands-on experience through on-site visits, internships, and workshops, allowing them to engage directly with real-world construction tasks.	In construction management, students could engage in discussions about their on-site experiences, challenges encountered, and lessons learned, either through group dialogues or reflective essays	In a construction management program, students could analyse case studies to refine construction strategies or apply theoretical knowledge to address real-world challenges	For construction management students, this could involve implementing capstone projects that allow them to apply their knowledge in a comprehensive, practical manner—whether through a small-scale project, the use of construction management software, or the development of a project plan based on their newly acquired expertise.

Bloom's Taxonomy

Bloom's Taxonomy categorises cognitive skills into six levels, ranging from basic recall to complex creation. With examples provided in a construction context, this can be summarised in the following table.

Remember	Understand	Apply	Analyse	Evaluate	Create
Recall facts, definitions, codes, or processes used in construction projects	Explain processes, principles, or concepts in construction and project management	Use learned knowledge in actual construction-related tasks	Break down complex construction scenarios; compare systems or project outcomes	Assess quality, make judgments, and support decisions with criteria or data	Design or build new systems, models, or management plans
List stages in a project lifecycle; Identify key roles in a construction project.	Explain how a Gantt chart shows project scheduling; Describe types of construction contracts.	Use estimating software to calculate material costs; Apply WHS regulations to a site plan	Analyse project delays using critical path analysis; Compare two procurement strategies.	Evaluate subcontractor bids for a project; Justify a choice of building materials based on lifecycle cost.	Design a site logistics plan; Develop a project management workflow using BIM or scheduling tools.

International Benchmarking

International courses were reviewed and benchmarked, with 42 detailed studies out of 1450 identified worldwide. These included master's programs, postgraduate courses, and short courses with titles such as "Certificate of Modern Methods of Construction" and "Master of Science: Sustainable BIM Management". Over 80% were full-time and predominantly on-campus, with less than 5% being blended learning. Most bachelor's degrees were based on foundational subject streams such as structural engineering, construction management, and architectural technology. Searched course titles include:

- Certificate of Modern Methods of Construction
- Master of Science: Sustainable BIM Management
- Masters: Construction Management (Offsite Construction)
- Diploma of offsite construction
- MSC in project management with offsite construction.



Figure 5. Summary of International Course Benchmarking

Course Example 1

The Construction Management and Technology, Bachelor of Science, Arizona State University Ira A. Fulton Schools of Engineering,

The Construction Management and Technology program at Arizona State University, offered by the Ira A. Fulton Schools of Engineering, is a comprehensive undergraduate course. It encompasses a diverse curriculum focusing on construction methods, materials, project management, and technology integration. Subjects include:

- Construction and Culture - a Built Environment
- Management and Strategy
- Business Law and Ethics for Managers
- Principles of Leadership for Project Managers
- Marketing for Construction.



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Construction Management and Technology, BS

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2023 - 2024 Major Map

Construction Management and Technology, BS

Degree: **BS**
College/School: **Ira A. Fulton Schools of Engineering**

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Source: Arizona State University (2024). [Construction Management and Technology, BS](#). Arizona State University, Tempe.

A feature of the Arizona State University, Construction Management and Technology course was its vertically integrated Building Information and Modelling curriculum.

A comprehensive approach to integrating Building Information Modeling (BIM) into construction management education at Arizona State University.			
1. Vertical Integration	2. Site Logistics Assignment	3. Outcomes	4. Improvements
- This approach involved pairing upper-division students in the CON453 Project Management + BIM lab course with lower-division students in the CON252 Building Materials and Methods course. This aimed to enhance retention of BIM knowledge and improve students' understanding of the practical application of BIM in construction projects.	- A key component of this approach was a "site logistics" assignment based on a real construction project. Students from both courses participated in site visits and collaborated to develop solutions for site logistics, combining their knowledge of building materials, methods, and BIM tools.	- It was anticipated that lower-division students would gain a better appreciation for their coursework's importance and relevance to future CM courses and the field. Upper-division students were expected to appreciate the importance of collaboration and understand BIM as a collaborative information management process rather than just a 3D model.	Surveys conducted after the pilot helped identify areas for improvement. Changes implemented in the next run included providing a risk identification matrix for structure, physically co-locating students for discussions, and expanding the BIM toolbox.

Source: Ghosh A., Parrish K. and Chasey A.D. (2015). "Implementing a vertically integrated BIM curriculum in an undergraduate construction management program." *International Journal of Construction Education and Research*, 11(2): 121–139.

Course Example 2

The University of Virginia's Civil and Environmental Engineering department offers an Undergraduate CEM (Construction Engineering and Management) Concentration.

The screenshot displays the University of Virginia's Civil and Environmental Engineering department website. At the top, the university's logo and the word 'ENGINEERING' are visible. Below this, the main heading reads 'CIVIL AND ENVIRONMENTAL ENGINEERING'. A navigation bar includes links for 'ACADEMICS', 'RESEARCH', 'PEOPLE', 'NEWS', 'GIVE', and a search icon. A breadcrumb trail indicates the path: 'DEPARTMENTS / CIVIL AND ENVIRONMENTAL ENGINEERING / ACADEMICS / GRADUATE DEGREES / CIVIL ENGINEERING ME / CONSTRUCTION ENGINEERING AND MANAGEMENT CONCENTRATION / UNDERGRADUATE CEM CONCENTRATION'. The main content area features a blue box labeled 'Undergraduate CEM Track' and a large heading 'Undergraduate CEM Concentration'. To the left, a contact information box for Diana Franco Duran, Assistant Professor, is shown, including her office location (Olsson Hall 113A), phone number (434-243-8765), email (dmf8a@virginia.edu), and a link to her Faculty Page. The main text describes the CEM track as a dynamic pathway within Civil Engineering undergraduate studies, designed to cultivate the next generation of construction professionals. It highlights the track's focus on a practical and skills-oriented education, combining theoretical knowledge with hands-on experiences in Construction Engineering and Management (CEM). Key highlights of the CEM Track are listed: 1. Within the CEM track, Civil Engineering students delve into immersive experiential learning that extends beyond conventional classroom boundaries. This approach imparts theoretical knowledge and exposes students to tangible on-site CEM experiences. As a result, they step into their roles as new project or field engineers with a distinctive edge, ready to excel from the very start. 2. Students opting for a Real Estate minor uncover the intricate interplay between construction projects and real estate. This interdisciplinary approach equips students with fundamental insights into navigating both sectors, effectively bridging the gap between the construction and real estate industries.

Source: University of Virginia (2024). [Undergraduate CEM Concentration](#). University of Virginia, Charlottesville.

This program is tailored to cultivate future construction professionals, blending engineering and business fundamentals. It features immersive experiential learning, interdisciplinary studies with a Real Estate minor. Subjects include:

- Project Business Planning
- Virtual Design and Construction (VDC) Coordination and Control
- Sustainability and Systems in the Built Environment
- Business and Technical Leadership in Engineering
- Introduction to Lean Enterprise and Six Sigma
- Land Development Engineering

Summary

Future Proofing the Construction Professional

Stream 1: *Context, Benchmarking, and Content* identified significant gaps in construction knowledge and education in Australia by benchmarking against global best practices. It established the project's foundational context through stakeholder engagement and market analysis, with research focused on forecasting skills and job demands over the coming decade to ensure a proactive response to industry change. A ten-year horizon was adopted, with the first intake into the bachelor's degree program projected for 2026 and the inaugural cohort graduating in 2029. A seven-year accreditation cycle was also proposed, with formal accreditation to be sought from an industry or professional body seven years after course commencement.

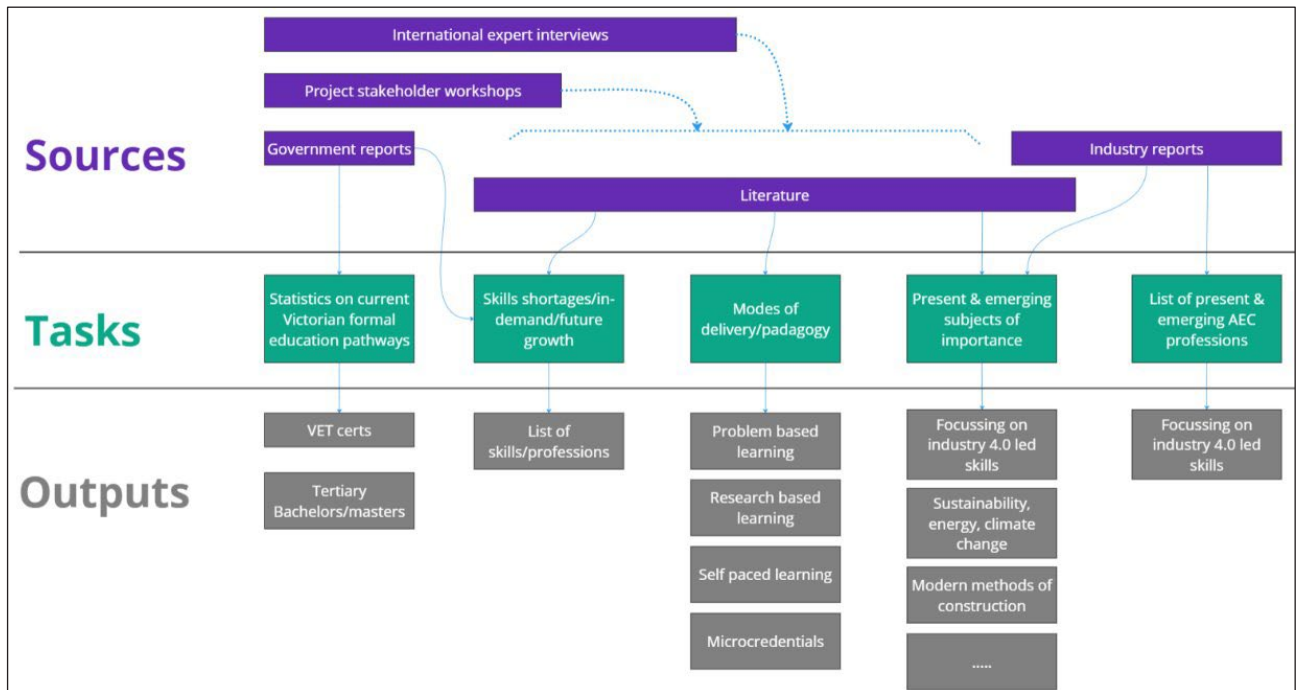


Figure 6. Overview of Research in Stream 1: Context, Benchmarking, and Content

4. “BUILDING” 2050

Designing the future construction hub typologies for Melbourne in 2050.

To complement and extend the benchmarking work outlined previously, a design studio in the Master of Architecture program at Monash University faculty of Art, Architecture, and Design (MADA) was undertaken from February to June 2024. The studio was used as a platform to investigate and prototype the disruptive technologies that will characterise the future of work in construction and the future of the workplace when it shifts from predominantly on-site to off-site construction practices.

This speculative design exercise was undertaken by 18 students enrolled in the Master of Architecture degree program at Monash and was led by Chris Knapp (Adjunct Professor, Monash University and Research Director, Building 4.0 CRC) and Jean-Paul Rollo (Senior Lecturer, Monash University). The studio imagined the Fisherman’s Bend section of Melbourne as a context for urban renewal, built upon a post-industrial landscape and co-located with future investment by the City of Melbourne to create an innovation precinct. Students were tasked with a major design exercise to propose a ‘construction hub’.



Figure 7. Studio model from the “Building” 2050 Monash Design Studio

MADA Masters Level Design Studio

Studio Overview

The 'Building' 2050 studio aimed to address the critical challenges faced by the building industry today, notably its significant contribution to climate change, as it accounts for approximately 39% of global carbon emissions. The construction sector is also grappling with various issues, including a shortage of skilled labour, rising housing costs, and corporate instability. These challenges have led to a crisis in the industry, emphasising the urgent need for transformative solutions. The studio conducted various speculative studies focusing on the state of Melbourne's Fisherman's Bend in the year 2050, during which carbon levels are projected to reach 685 ppm, and the city's population may soar to 8 million. Students were tasked with designing a new building model called Construction Through Advanced Manufacturing Precincts (C.A.M.P.) and developing the associated social, technical, and economic infrastructure necessary to support this vision. Additionally, the studio explored how housing production methods might evolve over the next 25 years and how this will, therefore, need to include a comprehensive investigation into the future construction workforce.

Studio Approach

The 'Building' 2050 studio was linked to the activities and approach of Building 4.0 CRC, aiming to expedite the construction industry's transformation into a more sustainable and technologically advanced and efficient domain. The 'four-point zero' concept aligns with the broader Industry 4.0 movement within the studio, highlighting the transformative impact of digital technologies on production processes and industry culture. Among the various research, this studio specifically ties to Project #66: Future of Construction Education. This initiative includes collaboration with Holmesglen Institute, alongside other academic institutions and industry stakeholders such as Lendlease and the Victorian Building Authority. The goal is to prototype the workforce and workplace of the future, leading to the development of a Bachelor of Future Construction program aimed at enrolling students by 2025.

Studio Focus

The studio invited the students to immerse themselves in a conceptual future state of the building industry, stimulating discussions around the evolution of architectural practice. The dual focus of the studio included not only the creation of a spatial proposal for a manufacturing complex but also the examination and representation of the future construction workforce. This approach of prefabrication, which has been a topic of architectural interest for nearly a century but has seen limited adoption, is being revitalised as a potential solution to contemporary challenges, such as housing shortages and escalating costs. The studio developed proposals for C.A.M.P, envisioned as essential infrastructure and community resources equipped with flexible programming options. An integral aspect of this initiative was understanding the future workforce, where approximately 300,000 construction jobs exist in Victoria today, but demand is expected to exceed supply. The current workforce is notably imbalanced, with only 11% female participation compared to 47% in other sectors. Furthermore, the rise of digital technologies necessitated a re-evaluation of the skills and profiles needed in the construction field. Students speculated on how emerging technologies might transform roles, challenge existing hierarchies, and create entirely new professional pathways within the industry.

Studio Outcomes

The Building 2050 studio generated outputs by students including a physical model of the CAMP precinct, research reports of various digital and manufacturing technologies, videos that futurecast scenario of living and working in 2050, and drawings/images that depict the future worker and work environment. These outputs are found in the Appendices of this report at Attachment 3.

5. STREAM 2: DEGREE MECHANICS

Future-proofing Australia's construction industry through innovative education and partnerships.

Introduction

A review of Australian construction courses (Attachment 2) revealed critical gaps in future-focused study options across all educational levels, including microcredentials, short courses, certificates, Vocational Education and Training (VET) courses, and bachelor and master degrees. Pathways between industry and education were also found to be poorly defined. Recruitment for digital skills and construction management roles frequently occurs outside the sector, drawing talent from industries such as automotive and aeronautical engineering. As technologies continue to evolve, future leaders must be equipped to navigate and drive industry change. Construction managers will need to adapt to new processes and technologies, with emerging roles reshaping the profession. The new program is designed to produce graduates capable of leading the adoption of these technologies.

The new bachelor's degree, developed in Stream 2, was created to address these critical gaps in knowledge, skills, and educational pathways aligned with the future needs of the construction industry. Developed in collaboration with Holmesglen Institute, the degree represents the main output of this research project. Holmesglen's entry into the market responds to an identified shortfall in the design and delivery of higher education offerings. This program is designed to bridge vocational training and university level education, bringing greater diversity and flexibility to the sector. It will provide a new approach that incorporates applied learning, knowledge management and industry relevant applications, providing a distinct pathway for future construction leaders.

The degree program was developed in accordance with mandatory accreditation requirements, including Holmesglen Institute's internal approval process, including review by Holmesglen's Course Advisory Review Panel (CDRP). It underwent external accreditation through the Australian Government's Tertiary Education Quality Standards Agency (TEQSA).

As part of the project, opportunities for alignment with existing competency frameworks were explored, with particular emphasis on future integration with standards set by peak bodies such as the Australian Institute of Building (AIB). The project adopted a ten-year time horizon, commencing with the first student intake in the bachelor's degree in 2026 and culminating in the inaugural cohort's graduation in 2029. A seven-year accreditation cycle was proposed, with the first formal accreditation to be sought from an industry or professional body seven years after course commencement.

Market Competition

An extensive benchmarking and desktop audit of relevant providers and programs across the various Australian Qualifications Framework (AQF) levels was conducted in January 2024, as detailed in Attachment 2. *Local Course Literature Review*. The audit encompassed a wide range of construction management courses with a focus on MMC related course content. It examined direct competitors, including local courses in Victoria as well as programs across Australia accessible to students via online delivery. Courses reviewed included those in construction management, advanced manufacturing and technology, and building design and construction.

The market competition review focused on four areas: i.) Construction management courses, ii.) Online delivered construction courses, iii.) Industry 4.0 Advanced manufacturing and technology courses, and iv.) Intensive, Short Courses and Microcredentials focused on MMC.

(i) Construction Management Courses (Direct Competitors)

Multiple universities across Australia offer programs in Construction Management including:

- Bachelor of Construction Management (Honours), RMIT University
- Bachelor of Construction Management (Honours), Victoria University
- Bachelor of Construction Management (Honours), Deakin University.

Additionally, it was noted that, candidates with degrees in disciplines such as property or architectural design often move into Construction Management roles. Specific course completion is not a formal prerequisite for employment in construction or project management positions.

(ii) Online Delivery Models:

It is proposed that the degree incorporate online mechanisms into its delivery, enriching the learning experience for students attending face-to-face classes while also supporting those who prefer or require remote access. The Australian Online Education industry is projected to grow steadily over the next five years, with revenue expected to rise by 8.7% from \$9.5 billion between 2023 and 2028.¹ Platform development has accelerated in response to the COVID-19 pandemic, with Australian universities adopting online course offerings at a higher rate than their international counterparts. Online education providers are now enhancing their platforms to regain international student enrolments, attract rural and remote learners and expand into markets unconstrained by geography.

Online courses in the program field include:

- Construction Project Management (Single Unit), University of Tasmania /OUA
- Diploma of Construction Management, University of Tasmania /OUA
- Bachelor of Applied Science (Construction Management) Curtin University /OUA
- Bachelor of Construction Management (Honours), University of South Australia /OUA
- Bachelor of Construction Management (Building), University of Newcastle / OUA
- Bachelor of Construction (Honours) (Construction Management), University of Southern Queensland / OUA.

Market Share of Online Educational Providers, Australia

Table 2. Market Share of Online Educational Providers, Australia.

Company	Market Share (%) 2023	Revenue (\$m)2023
Charles Sturt University	4.0	381.8
Swinburne University	1.0	95.5
Kaplan Education Pty Limited	0.5	47.7

Source: [IBISWorld \(2023\)](#).

(iii) Industry 4.0: Advanced manufacturing and technology courses

There are relatively few competitors actively developing or offering programs focused on Industry 4.0. Advanced technology subjects are commonly offered as electives within traditional courses rather than as core program components. Notable exceptions include:

Swinburne University of Technology's Associate Degree in Applied Technologies, developed in partnership with industry, offers three specialisations to choose from, including: advanced manufacturing, civil infrastructure or building information modelling. The advanced manufacturing stream specifically targets digitalisation and Industry 4.0 concepts. It is currently offered in person despite Swinburne's significant investment in online platform development.

The University of Technology Sydney (UTS), which offers postgraduate programs in sustainable leadership and sustainable technologies with subjects that emphasise technology and innovation management.

Bond University, which became the first Australian university in 2019 to offer a Master of Building Information Modelling and Integrated Project Delivery. The program holds accreditation from Building SMART, an internationally recognised peak body for BIM standards and education.

Local Industry 4.0 Advanced Manufacturing and Technology Courses (Extract from Attachment 2)

Table 3. Local Industry 4.0 Advanced Manufacturing and Technology Courses

Institution / Organisation	Swinburne University of Technology	The University of Technology Sydney (UTS Online)	Bond University
Program Title	Associate Degree in Applied Technologies, majoring in Advanced Manufacturing; Building Information Modelling; or Civil Infrastructure	Grad Cert in Sustainable Leadership Grad Cert in Sustainable Energy Technologies Grad Cert in Sustainable Practice Masters in Sustainable Leadership	Master of Building Information Modelling and Integrated Project Delivery
Degree type / Code	Associate degree AB-APPTec	Graduate Certificate Masters	Masters SD-93039
Location	Hawthorn, Victoria	Sydney, NSW	Gold Coast, Queensland
Delivery Mode	On Campus	Online	On Campus
Duration	Full-Time 2 years	Full-Time 8 months (Grad Cert) Full-Time 2 years (Masters)	Full-Time 2 years
Structure	16 Subjects (3CU + 12-13MU)	4 Subjects (GC) 27 Subjects (9CU + 18 ES) (M)	27 Subjects (9CU + 18 ES)
Fees	\$17,896.00	\$15,850.00 (Grad Cert) \$47,550.00 (Masters)	\$47,550.00
Overseas/domestic learners	Domestic Only	Domestic and International	Domestic and International
Industry endorsement	Not Specified	Not Specified	buildingSMART Australasia. Capstone Project can be taken as Work Placement

Project #66: Future of Construction Education

Subjects /Strands	Working in Industry 4.0 (CU), Cyber-Physical Systems Integration (CU), Innovation for Industry 4.0 (CU), Artificial Intelligence for Industry 4.0 (MU), CAD/CAM and Engineering Materials (MU), Industrial Networking and Cloud Computing(MU), Object Oriented Programming: Industrial Control Systems (MU), Digital Control Systems Engineering and Electrical Skills for Industry (MU), Software Tools for Industry 4.0 (MU), Advanced Digital Control Systems (MU), Advanced Electrical Machines (MU), Predictive Engineering Analytics (MU), Robotics and Digital Twin(MU), Cyber Security and Cloud Services (MU), Distributed Control in a Smart Factory (MU) * CU= Core Unit, MU= Major Unit	Shaping Policies for the Future (CU), Sustainable Practices in Industry (CU), Science of Climate Change for Leaders (CU), Science and Big Data (CU), Clean Energy Technology (CU), Sustainable Energy: Sources and Systems (CU), Innovation in Energy (CU), Science of Climate Change for Leaders (CU), Sustainable Energy: Sources and Systems (CU), Sustainable Practices in Industry (CU),	Foundations of Intelligent Construction (OpenBIM), Intellectual Property Rights (Data Exchange), (Modelling for Data and Visualisation) 4D-BIM (Schedule Optimisation), 5D-BIM (Cost Modelling), BIM for Environment Sustainability Assessment, BIM for Asset and Facilities Management,, BIM and BIG DATA (Geographical Information Systems (GIS)), Process Evaluation and Change Management in BIM, Continuous Process Improvement (Quality and Safety Standards), Productivity and Off-site Fabrication (Minimising Waste), Managing Complexity in Construction (Maximising Value), BIM/IPD Capstone (Project), BIM/IPD Capstone (Work Placement
What they say:	The Advanced Manufacturing Major is an engineering and digital technologies course that equips you with essential professional and technical skills in Advanced Manufacturing with a focus on digitalisation and Industry 4.0. In this program, you'll learn the principles of smart 3D modelling and associated tools such as virtual reality, photogrammetry, laser scanning and more. You'll receive training that turns you into a technical expert within the engineering and technology sector. You can study on campus at Swinburne, while also spending time with an industry partner to ensure you receive state-of-the-art coaching. Our Associate Degree in Applied Technologies is an engineering and digital technologies course developed in conjunction with our industry partners.	Evaluate emerging technologies, communicate scientific concepts, and make informed decisions to solve complex problems in sustainable energy. Gain multidisciplinary expertise in technical and economic analysis, social and community impact, and technology integration for sustainable energy management. Integrate technological advancements and gain skills to influence policy and drive innovation. You'll receive training that turns you into a technical expert within the engineering and technology sector. You can study on campus at Swinburne, while also spending time with an industry partner to ensure you receive state-of-the-art coaching. Our Associate Degree in Applied Technologies is an engineering and digital technologies course developed in conjunction with our industry partners.	Building Information Modelling (BIM) and Integrated Project Delivery represent the future of the construction industry. Developed in response to the challenge of lost productivity, budget blow-outs, time over-runs and waste that plagued major construction projects, IPD is a way of managing projects so that every member of the building team – owner, architect, contractors, engineers, fabricators, and subcontractors – work collaboratively throughout the construction process. Bond's Master of Building Information Modelling and Integrated Project Delivery is a cutting edge program which has been designed in close collaboration with industry to prepare graduates for leadership roles in consultancies, client organisations and contracting organisations
Online link:	Associate Degree of Applied Technologies majoring in Advanced Manufacturing Swinburne	https://studyonline.uts.edu.au/ppc/graduate-certificate-sustainable-leadership	Master of Building Information Modelling and Integrated Project Delivery Gold Coast (bond.edu.au)

Source: Extract from Attachment 2.

(iv) Intensive, Short Courses and Microcredentials: The microcredential market is expected to experience strong growth, driven by increasing demand for short, specialised certifications addressing the skills gap and rising industry requirements for Continuing Professional Development (CPD) offerings. Once established, the Bachelor of Digital Construction and Management will be well placed to offer microcredentials based on its subject streams. These microcredentials may be developed from modularised, assessed components of the bachelor's curriculum or individual subjects. (Australian Government, 2021)

Currently available short courses offered in MMC are in the field of prefabrication and modular design, primarily targeting local Continuing Professional Development (CPD) participants.

- **Structural Design of Prefab and Modular Building Construction**, University of Melbourne, 6 Weeks 12 Hours. Online Short Course
- **Introduction to Prefab Modular Design and Construction**, Swinburne University of Technology, 6 Weeks 15 Hours. Online Short Course.

Local Industry 4.0 Advanced Manufacturing Short Courses

Table 4. Local Industry 4.0 Advanced Manufacturing and Technology Short Courses

Institution / Organisation	University of Melbourne	Swinburne University of Technology
Program Title	Structural Design of Prefab and Modular Building Construction	Introduction to Prefab Modular Design and Construction
Degree type / Code	Undergraduate Short Course	Undergraduate Short Course
Location	Parkville, Melbourne	Hawthorn, Victoria
Delivery Mode	Online	Online
Duration	6 Weeks 12 Hours	6 Weeks 15 Hours
Structure		5 Sessions
Fees	\$750.00	\$500.00
Overseas/domestic learners	Domestic	Domestic
Industry endorsement	Continued Professional Development	Continued Professional Development
What they say:	Gain the specialist skills sought by employers in the construction sector for designing prefab buildings. Be introduced to the principles of prefab and modular building construction and its structural design. With the aid of industry-recognised software, you will analyse practical case studies to enhance your understanding of crucial concepts, including conceptual design, hinge assembly DfMA design, and integrated design of timber and steel prefab structural systems. Learn basic concepts behind the assessment of	This is the first short course in a three-part series. The following two courses will be more advanced and build on the knowledge gained in this introductory course. Introduction to prefab modular construction, Tutorial: Basic concept of modular design, Precast structures and the importance of AS3850, Use of precast elements and joints in prefab modular, Tutorial: Precast lifting/joint design, Use of timber elements in prefab construction, Introduction to lifting, transportation and placement,

	loads and support conditions that apply to prefabricated units during their transportation, lifting and handling. Apply these concepts to practical scenarios to ensure minimum damage to prefabricated units during all stages of manufacturing and installation	Tutorial: Lifting and transportation and placement, Case Studies: Steel and timber prefabricated buildings, Case Studies: Precast Prefabricated Buildings, Future of prefabricated modular design and construction, Case Study: Timber modular building, Research work on prefabricated modular construction
Online link:	Structural Design of Prefab and Modular Building Construction - Short Course (unimelb.edu.au)	Introduction to Prefab Modular Design and Construction Swinburne

Source: Extract from Attachment 2.

Target Market

The new bachelor's degree has been developed to engage industry participants, diploma graduates, and VCE students seeking to advance their careers in the construction sector. This industry-based, applied program is designed to strengthen employment outcomes by facilitating direct engagement with the industry, thereby offering applied learning opportunities that integrate theoretical knowledge with practical application. Its distinctive value lies in connecting students with industry practitioners, providing access to invaluable networking and project based learning grounded in real world scenarios.

Enrolments are expected to grow gradually over the first three years, starting with an initial cohort of 18 students, expanding to 40 students in the second year and reaching 60 students by the third. This projected growth is expected to be fuelled by a multifaceted promotional strategy, including internal promotion, leveraging the network of alumni, and listing in the VTAC Handbook. A concerted effort to highlight the program's industry and profession-focused seminars, along with engaging publicity materials and forming strategic partnerships with industry leaders for the provision of education and training programs, will further support student recruitment. These projections are informed by intake patterns of a previous degree program, reinforcing the demand for relevant industry-aligned education in the contemporary construction landscape.

Point of Difference

Structure: The program's structure is designed to offer flexibility and adaptability, responding dynamically to changes in industry demands and technological advancements. It provides six clusters targeted to emerging high demand technical skills that are not currently offered as a single course by competitors. Many of the competitors highlighted in *Attachment 2* are 4-year honours degree courses. This distinction underscores the benefit of the 3-year degree program, allowing students to complete their qualifications earlier and enter the workforce more quickly, offering a significant advantage in career progression. Moreover, the degree is not merely endorsed by industry partners; it will actively involve them in the course delivery in various capacities, such as authentic, industry-based assessment and guest lecturers, ensuring that the curriculum is closely aligned with current industry practices and innovations. Lastly, the structured cluster approach within the program is designed to cultivate well-rounded professionals, equipping them with the essential knowledge, skills, and capabilities to work in their professional capacity with minimal supervision, thus preparing them for immediate and effective industry engagement.

Content: The curriculum, crafted in collaboration with industry leaders, aligns closely with the most current demands of the sector, spotlighting areas such as digitalisation, the principles of Industry 4.0, and innovation in product development. This alignment ensures that the content stays at the cutting edge of technological progress. The course is enriched with applied learning experiences, encompassing industry-specific challenges, projects, and simulations, offering students genuine, hands-on learning interactions. These elements facilitate direct engagement with industry professionals, who enrich the educational experience through guest lectures, site visits, and

contributions to formulating industry-relevant problems. This aspect of the program is particularly compelling, as it fosters vital networking opportunities and provides students with experiential learning that mirrors real-world industry situations.

Graduate Outcomes: Graduates of the program will emerge with a comprehensive skill set that combines technical expertise in digital technologies, advanced processes, and industrialised construction with essential interpersonal capabilities such as critical thinking, problem-solving, innovation, resilience, and ethical judgment. This integrated blend of skills ensures graduates are workforce-ready from the outset, equipped to excel in their roles while also being prepared for continuous learning and progression into leadership across their chosen professions.

Delivery Approach: The course is designed for maximum access and flexibility, supporting various delivery modes including full-time and part-time study options, on campus and remote/mixed delivery. The program facilitates seamless transferability between modes of delivery, supported by an online learning platform that enables communication and collaboration among students across different delivery modes. The innovative use of a custom online support platform enhances the delivery by enabling effective student-tutor interaction and access to learning resources and administrative functions, ensuring a supportive and interactive learning environment. A key point of difference for this program is its flexibility and accessibility, facilitated by a hybrid delivery model that caters to both full-time and part-time students, blending on campus instruction with remote and mixed delivery options.

Course pathways

Internal articulation to the course

Potential pathways into the course are provided by the following VET qualifications currently offered by Holmesglen Institute:

- Certificate IV in Building and Construction (Building)
- Diploma of Building and Construction (Building)
- Advanced Diploma of Building Design (Architectural).

Additional internal pathways into the course may become available from new programs planned for introduction within Holmesglen Institute's VET Building and Construction department, within the next 2-3 years. These include:

- Short courses in REVIT
- Diploma of Interior Design.

Internal Pathways from other Holmesglen Institute Programs

- Graduate diplomas (once developed)

External articulation to the course

External pathways into the course are projected to come via the following routes:

- Industry partners
- Special Tertiary Admissions Test (STAT)
- Year 12 (Australian secondary school certificate) or equivalent
- Vocational qualification (AQF Level 4)
- Higher Education qualification
- Demonstrated work-life experience
- Certificate IV Diploma and higher qualifications.

External Pathways from the program: Industry Employment

Both traditional

- BIM Manager
- Construction Manager
- Design Manager
- Project Manager
- Sustainability Manager
- Project Coordinator
- Chartered builder
- Value Engineer
- Building Technologist

External Pathways from the program: Further Education

- Graduate certificate
- Master's degree
- Industry body development course

Projected Learner Enrolments 2026-2028

Table 5. Projected Learner Enrolments 2026–2028

	Commencement Year 2026 enrolment	Second Year 2027 enrolment	Third Year 2028 enrolment
Domestic	18	32	50
International	0	8	10
Domestic EFTSL	18	32	50
International EFSTL	0	8	10
TOTAL EFTSL	18 EFTSL	40 EFTSL	60 EFTSL

Course Overview

Program Name

The bachelor's degree has been titled Bachelor of Digital Construction and Management, following internal discussions at Holmesglen. This name was chosen to align closely with our strategic goals for student recruitment, while emphasising the program's relevance to industry transformation. The inclusion of "Digital" enhances its appeal to the student cohort we aim to attract and reflects our commitment to preparing graduates for the evolving demands of the construction sector.

There are several justifications for this preference:

Alignment with Recruitment Strategy - We have determined that this name would better resonate with our target student demographic, making the program more attractive and relevant to their aspirations. This alignment is crucial for enhancing our recruitment efforts and ensuring the program's success.

Emphasis on Digital Skills - The term 'Digital' in the program's title underscores our focus on niche markets and the imperative for future Holmesglen graduates to possess advanced digital skills. This is particularly relevant as the industry continues to evolve, with digital competencies becoming increasingly critical. The inclusion of this term signals our commitment to equipping students with the skills necessary to excel in a digitally transformed sector.

Clarity in Career and Employment Opportunities - By specifying 'Digital Construction and Management' in the name, we provide clarity for both students and employers about the career and employment possibilities associated with this qualification. It clearly indicates the program's focus and the potential pathways it opens for graduates, thus enhancing its attractiveness and relevance to industry needs.

Program Duration

Following extensive industry discussions and consultations with Holmesglen Institute, we collectively agreed to advocate for a three-year duration for the degree program. This decision reflects the need of industry participants for a concise, well-structured pathway to qualification. A three year degree will be more attractive to prospective students and align with the aspirations of those eager to enter the industry as quickly as possible. If delivered in trimester mode (currently under consideration), students could potentially complete the qualification within two calendar years, further enhancing its appeal.

Subject Clusters and Core Competencies

A comprehensive degree program was developed to align with the identified needs, forecasts, and benchmarks established through the research. Industry interviews informed the positioning and focus of the course, ensuring relevance to sector priorities. Building on the findings from Stream 1, the program incorporates a framework of vertically integrated knowledge streams and core competencies that provide a strong foundation for future learning and professional practice.

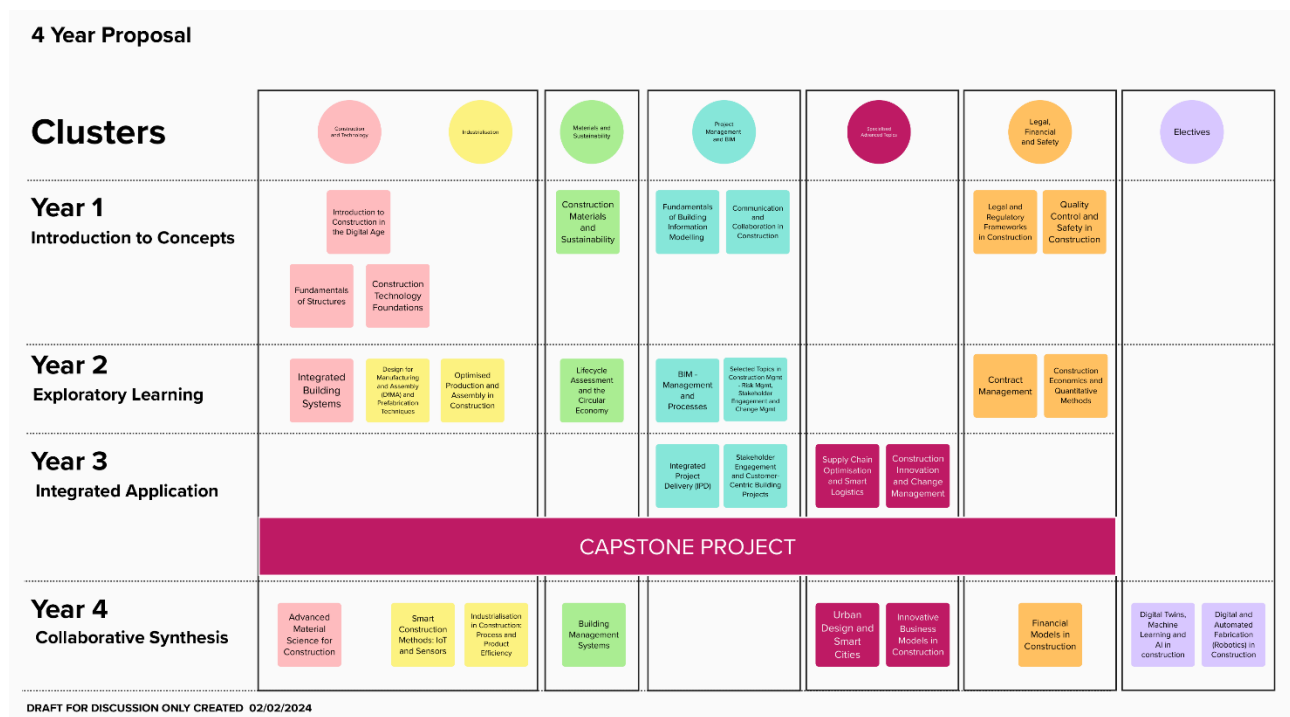


Figure 8. Course Structure 4-year degree proposal

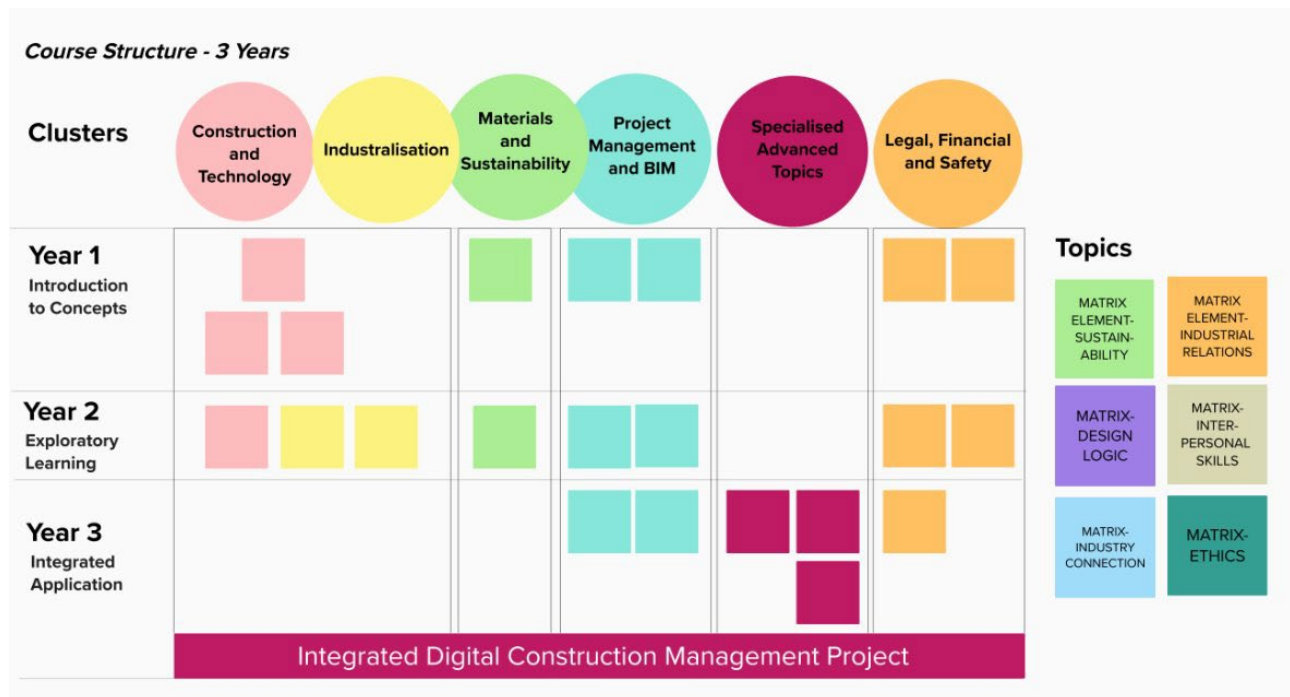


Figure 9. Adopted Course Structure 3 years duration

Course Structure

The following program rules were adopted for the course:

- To be eligible for the award of the Bachelor of Digital Construction and Management, students must complete 144 credit points comprised of:
 - 132 credit points of 22 core subjects (6cp each)
 - 12 credit points of 1 Capstone project (12cp)
- Course duration: Full-time: 3 years Part-time: 6 years
- Delivery mode: Face-to-face integrated with mixed / blended delivery.

Learning Outcomes

Curriculum Map and Subject Learning outcomes

Bachelor of Digital Construction and Management (BDCM) curriculum map (*Appendix 3*) details a three-year program. It itemises core subjects for each year, providing subject objectives that focus on integrating digital technologies, sustainability and modern construction methods. The curriculum map also specifies learning outcomes for each subject, alongside average weekly contact and independent learning hours. It details the assessment methods and their respective weightings, ensuring a comprehensive understanding of the course structure.

Course Learning Outcomes

Bachelor of Digital Construction and Management is designed to produce graduates who:

- Can effectively manage and oversee construction projects from inception to completion, ensuring they are delivered on time, within budget, and to the required quality standards
- Are adept in utilising digital workflows to enhance construction planning, execution, and management

3. Are skilled in the principles and applications of Design for Manufacture and Assembly (DfMA) and modular construction, required for modern construction projects that demand efficiency through integrated building systems
4. Promote sustainability in the construction industry through knowledge of embodied and operational carbon, sustainable materials, energy-efficient construction methods, and the principles of the circular economy
5. Have knowledge of existing and emerging legal and regulatory frameworks specific to the construction industry, ensuring compliance, effective risk management, and ethical practices
6. Possess the knowledge and skills to apply automation technologies in construction, improving productivity, safety, and quality control
7. Can effectively communicate and collaborate with a wide range of stakeholders, utilising interpersonal skills and modern communication tools to facilitate successful project outcomes. Integral to this outcome is interdisciplinary team building and collaboration to address complex problems and explore new perspectives
8. Are contemporary, innovative, ethical, future independent critical decision makers committed to personal and professional development.

Graduate Outcomes

1. Master Modular Construction Techniques

Students will gain expertise in the principles and applications of Design for Manufacture and Assembly (DfMA) and modular construction, preparing them for roles in modern construction projects that demand efficiency through integrated building systems.

2. Leverage Digital Technologies for Construction Management

Graduates will be adept in utilising digital workflows, including BIM, to enhance construction planning, execution, and management, aligning with the industry's shift towards digitalisation.

3. Understand Sustainable Construction Practices

Students will learn about sustainable materials, energy-efficient construction methods, and the principles of the circular economy to promote sustainability in the construction industry.

4. Navigate Legal and Regulatory Frameworks

Graduates will have a comprehensive understanding of the legal and regulatory environment affecting the construction industry, ensuring compliance and effective risk management.

5. Implement Automation in Construction Processes

The program will equip students with the knowledge and skills to apply automation technologies in construction, improving productivity, safety, and quality control.

6. Engage in Cross-disciplinary Communication and Collaboration

The program will prepare graduates to effectively communicate and collaborate with a wide range of stakeholders, utilising interpersonal skills and modern communication tools to facilitate successful project outcomes. The fact that the industry works in teams across projects will be integral to this outcome.

Digital Competency

The Digital Construction and Management course is designed to thoroughly integrate Building Information Modelling (BIM) and digital processes into all construction workflows, highlighting the critical role these technologies play in modern construction projects. Given the course's focus on advanced digital practices, it necessitates the procurement of specific software licenses. These tools, including Autodesk Revit, Autodesk Advanced Steel, Autodesk Navisworks, Autodesk Build, Bluebeam Revu Basics, and Microsoft Project, are essential for students to gain hands-on

experience with industry-standard technologies, enabling them to manage and contribute to digital construction projects effectively.

Australian Qualifications Framework (AQF)

The Australian Qualifications Framework (AQF) is the national policy for regulated Australian education and training qualifications. At the bachelor's level (AQF 7), students will gain the skills and knowledge needed for many professional, high-level or management jobs. They will be able to work autonomously, provide specialist advice and functions, and have well developed judgement and problem solving abilities. The learning outcomes and assessments of the course were written to align with AQF skills and knowledge outcomes.

Accreditation of the Higher Education Program

The following steps were undertaken to obtain approval of the bachelor program through the sub approval from the Courses Committee (CC,) the Course Development Reference Panel (CDRP) and the Course Development and Council of Education and Applied Research (CEAR) at Holmesglen Institute with the final submission for accreditation of the course being sent externally to the Education Quality and Standards Agency (TEQSA) Australia's independent national quality

Internal Course Approval Process

Holmesglen Institute's internal course approval process undergoes the following steps and milestones

Appropriate accrediting authority guidelines and format were accessed and discussed
Establish Course Development Reference Panel (CDRP)
Prepare information for the first CDRP meeting -Course rationale, including body of knowledge -Curriculum map -Course structure and sequence
Identify and prepare the course development team as required
Conduct the first CDRP meeting
Develop subject outlines and complete draft TEQSA Application for Accreditation
Conduct the second CDRP Meeting
Complete TEQSA Application for Accreditation / Re-accreditation form
Complete TEQSA Application Form 'Adding One or More Courses of Study on CRICOS Application'
Council of Education and Applied Research or nominee approval to submit to TEQSA
Submission to TEQSA
Respond to TEQSA requests for additional information as required

External Course Approval Process

Mechanics of the TEQSA Approval Process

The mechanics of the TEQSA (Tertiary Education Quality and Standards Agency) approval process are designed to ensure that higher education providers in Australia meet the standards set out in the *Higher Education Standards Framework (Threshold Standards) 2021*. The following steps outline the Core Mechanics of the TEQSA Approval Process.

Application Submission

Education Provider, in this Holmesglen Institute, submits a formal application under Section 46 of the TEQSA Act 2011. The application must include detailed documentation covering course design, staffing, learning outcomes, assessment methods, and alignment with AQF levels.

Assessment Scope

TEQSA assesses the application against relevant Threshold Standards, including:

- Admission (1.1.1)
- Learning Outcomes & Assessment (1.4.1–1.4.4)
- Course Design (3.1.1–3.1.5)
- Staffing & Resources (3.2.1–3.3.1)
- Course Approval & Accreditation (5.1.2–5.1.3).

Additional standards apply if the course includes research or third-party delivery.

Risk-Based Evaluation

TEQSA uses a regulatory risk framework to identify potential risks to course quality. If risks are found, TEQSA may expand the scope of assessment and request further information before making a decision.

Consultation and Feedback

Providers are given opportunities to respond to concerns or provide additional evidence.

Decision and Notification

TEQSA either approves or rejects the application. Approved courses are listed on the National Register of Higher Education Providers.

Ongoing Monitoring

Providers must notify TEQSA of any material changes (e.g., curriculum updates, staffing shifts) that could affect compliance. TEQSA may conduct audits or request reviews to ensure continued alignment with standards.

Integration with CRC Projects

The project findings from previous and developing CRC research projects show a holistic and informed approach to curriculum development. Current and future CRC research publications have been included in course recommended readings throughout 10 of the 23 subjects in the course. A mapping of CRC touchpoints in the project is illustrated in Figure 10, Including reference to this current, Australian based research as a method of maintaining relevance in the course content.

Year 1				
Subject Stream	Introduction to Design and Construction in the Digital Age	Construction Materials and Sustainability	Quality Control and Safety in Construction	Legal and Regulatory Frameworks in Construction
Building 4.0 #CRC Project Cross over	Building 4.0 CRC #17 The Implications of Industry 4.0 for the Building Industry. Towards a Roadmap.	Building 4.0 CRC Project #48 Scoping Study for Building the Future – Circular Economy	Building 4.0 CRC Project #29 Real-time EH&S Intervention to Improve Site Safety	Building 4.0 CRC Project #21 Regulatory Reform for Industrialised Construction.

Year 2	
Subject Stream	Emerging Trends in Construction Management
Building 4.0 #CRC Project Cross over	Building 4.0 CRC Project #40 Business Model Innovation: Platform Ecosystems.

Year 3				
Subject Stream	Integrated Project Delivery	Construction Innovation and Change Management	Smart Contracts in Construction	Innovative Business Models in Construction
Building 4.0 #CRC Project Cross over	Building 4.0 CRC Project #38 Victorian Government Digital Build: Translating Theory into Practice	Building 4.0 CRC Project #49 Implication of Industry 4.0 Technologies on Work Practices	Building 4.0 CRC Project #55 Smart Contracts and Smart Finance	Building 4.0 CRC Project #3 Projects to Platforms. Building 4.0 CRC Project #40 Business Model Innovation: Platform Ecosystems.

Guide to Subject Stream

Construction and Technology	Materials and Sustainability	Project Management and BIM	Legal, Financial and Safety	Specialised Advanced Topics
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Figure 10. Building 4.0 CRC Projects Mapped against Course Subjects

Closing the Gap- Future Mirco credentials

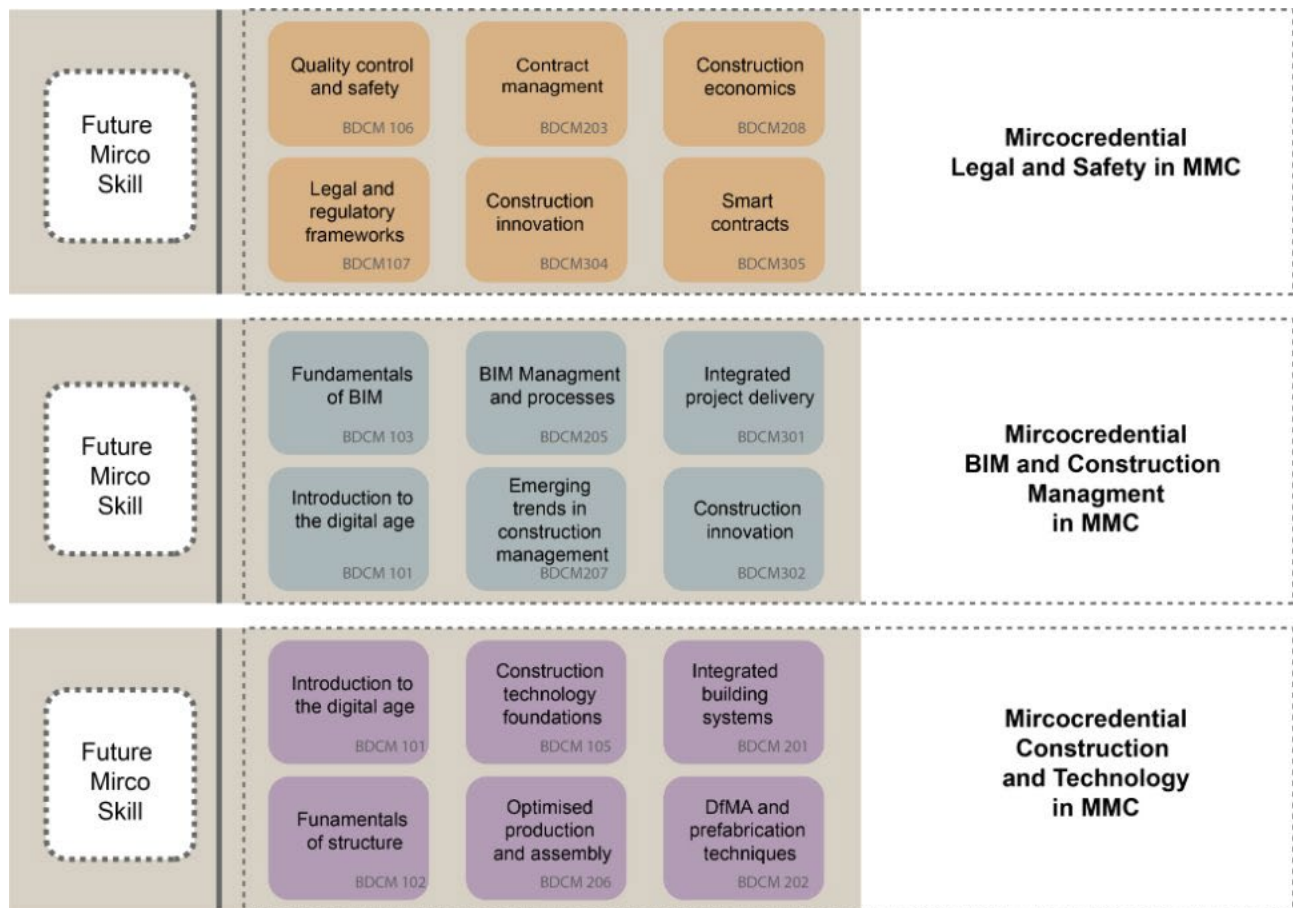
A curriculum mapping exercise was undertaken to explore future micro-skill and microcredential pathways into the bachelor program. These learning blocks were integrated into the existing structure of the bachelor's degree and designed to be delivered in a condensed timeframe to support flexible learning.

Introductory micro-skills were identified as potential scaffolding tools to orient learners toward the microcredentials and the broader bachelor qualification. Microcredentials also offer an optional exit point for students who elect not to complete the full three-year degree, supporting diverse learner needs and progression pathways.

The proposed microcredential suite comprises four existing accredited subjects, with scope to develop a lead-in micro-skill as a future enhancement.

Microcredentials offer in the following streams:

- Legal and safety in MMC
- BIM and construction management in MMC
- Construction and technology in MMC.



Guide to Subject Stream



Figure 11. Microcredentials and Subject Streams building into the Bachelor of Digital Construction and Management

Professional and Industry Recognition

Professional and industry recognition are not required for course graduates to be employed in the construction field; however, they can increase the program's value to future learners and graduates. Potential Industry recognition and / or accreditation that could be sought, based on course content, include:

- Building Smart Australasia (BIM Specialisation Accreditation)
- The Australian Institute of Project Management (AIPM), Australian Institute of Quantity Surveyors (AIQS)
- Royal Institution of Chartered Surveyors (RICS).

Recognition of the Course is subject to each industry's requirements and would require further investigation. In addition to the required education standards (curriculum requirements), practice standards (complete periods of practical experience) and professional standards (continuing professional development) may be applicable to meet membership or accreditation requirements.

Alternative pathways to accreditation or membership are offered by most professional bodies. Student or graduate membership may be offered by some industry bodies. Building Smart Australasia is considered a BIM 'peak body' for BIM Specialised Courses. Bond University received an accreditation for their Master of BIM/IPD from this organisation.

Traditional and Future Focus Topics

The development of the degree embeds construction management fundamentals while also anticipating future industry developments. The course integrates both traditional and future focused subjects ensuring a balance between established construction knowledge and emerging practices. A solid base of current construction understanding was instilled so students are immediately employable on graduation. Approximately 40% of subjects of subjects focus on core competencies and traditional subjects, with the remaining subjects emphasise future orientated building approaches such as Design for Manufacture and Assembly (DfMA) and MMC procurement methods. Emerging technologies, skills, and practices relevant to the field of construction management were incorporated. Notably 15% of the 98 learning outcomes explicitly address interpersonal skills, including collaboration, communication, stakeholder management, roles and responsibilities and integration.

Analysis of Degree Topics

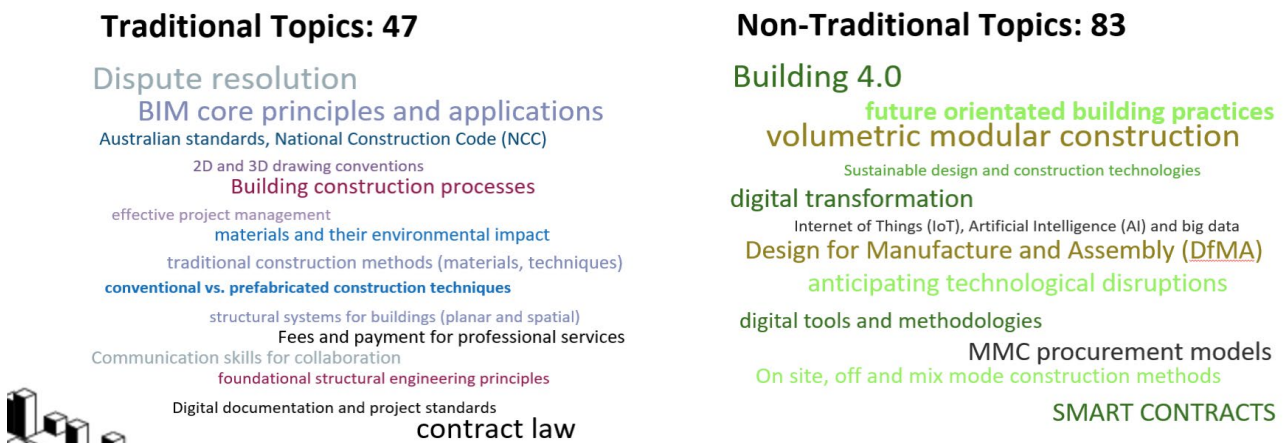


Figure 12. Core Competencies vs Future Focused Construction Methods

6. SUBJECT MATTER MODULES

Design and introduction of pilot modules that delve into specific subject matters.

Two subjects within the bachelor program were fully developed for delivery and submitted to TESQA as part of the course approval process. Introduction to Design and Construction in the Digital Age and Fundamentals of Building Information Modelling (BIM) were expanded to include:

- Detailed Subject Topics
- Weekly teaching outlines
- Lecture materials
- Workshops
- Materials
- Subject guides
- Assessments
- Assessment Guides.
- Assessment Rubrics.

Introduction to Design and Construction in the Digital Age explores the broader context of Industry 4.0, including its historical significance, impact on productivity, and an introduction to digital technologies such as the Internet of Things (IoT) and Artificial Intelligence (AI). It also introduces contemporary procurement and construction approaches, including Design for Manufacture and Assembly (DfMA).

Fundamentals of Building Information Modelling (BIM) focus is on BIM principles and their application across the construction lifecycle. The subject covers model creation, data analysis, and integration with complementary digital tools to support innovation and project delivery. It emphasises the role of BIM in driving digital transformation and equipping learners with skills for technology-enabled construction practices.

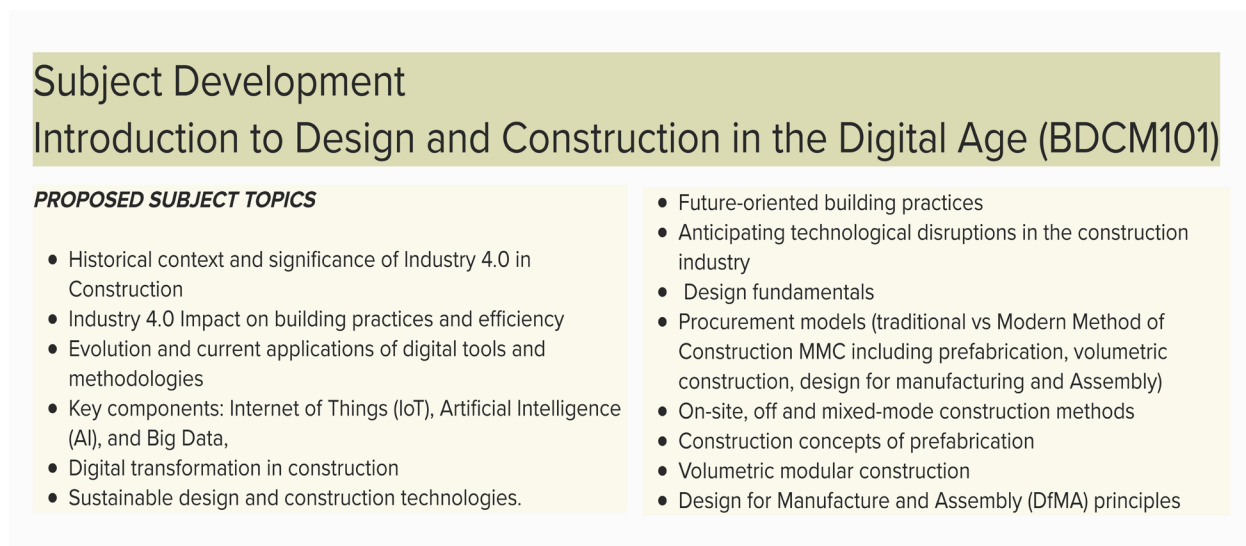


Figure 13. Overview of subject development – Introduction to Design and Construction in the Digital Age

Subject Development

Fundamentals of Building Information Modelling (BDCM103)

PROPOSED SUBJECT TOPICS

- Fundamentals of Building Information Modelling (BIM)
- Model Creation and Manipulation
- Construction lifecycle and decision-making
- BIM core principles and applications
- BIM governance (policies, project standards and ISO16739)
- Project Control
- Digital documentation and project standards
- Simulation and visualisation tools
- Analysis and data extraction
- BIM integration for project management
- BIM software skills
- BIM for decision- making
- Bim and Digital transformation
- 3D BIM model creation and review
- Leveraging technology for innovation
- BIM integration with digital tools (Design automation, parametric design, CAD software)

Figure 14. Overview of subject development – Fundamentals of Building Information Modelling

7. STREAM 3: BROADER FRAMEWORK

Actionable framework document that provides a vision and roadmap for education transformation in the Australian construction sector and higher education landscape.

Broader Program Development/ Framework

This framework aims to provide a clear vision and actionable roadmap for transforming education in the Australian construction sector and higher education landscape. It contextualises the bachelor's degree as a foundational qualification within a comprehensive educational journey spanning from certificate and diploma levels through to postgraduate studies.

Framework Overview

- **Educational Journey Mapping**
The framework maps an overarching educational pathway beginning with certificates and diplomas, progressing through bachelor's degrees, and extending to various master's degree alternatives. This pathway supports multiple entry and exit points, facilitating flexible student transitions between study levels and into industry roles.
- **Pathways and Industry Integration**
The framework emphasizes strong pathways connecting education to industry, ensuring students can move fluidly between academic study and work placement. Work placements are mandatory in many vocational education and training (VET) courses, reinforcing employability and practical skills development.
- **Multi-modal and Flexible Learning**
To accommodate diverse student needs and evolving industry demands, the framework supports multi-modal delivery modes, including online learning and module stacking. Module stacking allows students to accumulate credits progressively, building qualifications over time in a flexible manner.
- **Postgraduate Alternatives**
The framework explores alternatives for postgraduate education, including post-professional master's degrees that build on the bachelor's foundation. These alternatives aim to broaden skills and knowledge relevant to advanced construction roles and leadership positions.

Analytical Steps and Justification

- The framework is built on extensive review of current national qualifications frameworks (AQF), industry competency standards, and senior secondary education reforms that promote flexible, lifelong learning pathways.
- Key decisions are underpinned by evidence-based policy recommendations emphasizing student engagement, equity of access, and responsiveness to future industry needs. This includes integrating work-based learning, supporting disadvantaged students, and using data-driven insights to refine education pathways.
- Framework diagrams illustrate the educational journey, showing how students can enter at various levels (certificate, diploma, bachelor's) and progress through stacking modules toward advanced qualifications, with clear linkages to industry requirements and employment outcomes.

Practical Recommendations and Strategies

- **Develop a Modular Curriculum** aligned with industry competency standards and flexible delivery modes (online, blended, face-to-face) to support diverse learner needs and enable stacking of subject modules toward qualifications.
- **Establish Clear Pathways** from vocational certificates and diplomas to bachelor's degrees and postgraduate qualifications, with multiple entry and exit points to accommodate different student backgrounds and career goals.
- **Embed Work Placements and Industry Collaboration** as mandatory components to ensure practical skills and employability, supported by partnerships with construction industry stakeholders.
- **Implement an Education Passport System** to document and communicate students' skills, qualifications, and experiences across education and employment transitions, enhancing lifelong learning and career mobility.
- **Manage Intellectual Property (IP) and Content Sustainability** by developing open-access resources and clear IP policies to enable broad dissemination and ongoing content updates, ensuring the program remains responsive and sustainable.
- **Define Reporting Metrics** such as student progression rates, employment outcomes, industry satisfaction, and program responsiveness to emerging construction technologies and standards.

This actionable framework provides a comprehensive, flexible, and future-proof approach to construction education in Australia. It integrates national qualifications, industry standards, and innovative learning modalities to support student success and sector growth. By embedding clear pathways, work-integrated learning, and sustainable content management, the framework ensures the new program is responsive, equitable, and broadly disseminated.

This report includes detailed analytical justification and practical recommendations to guide the transformation of construction education, ensuring alignment with industry needs and higher education standards in Australia. Framework diagrams and pathway maps will visually represent these concepts for clarity and implementation planning.

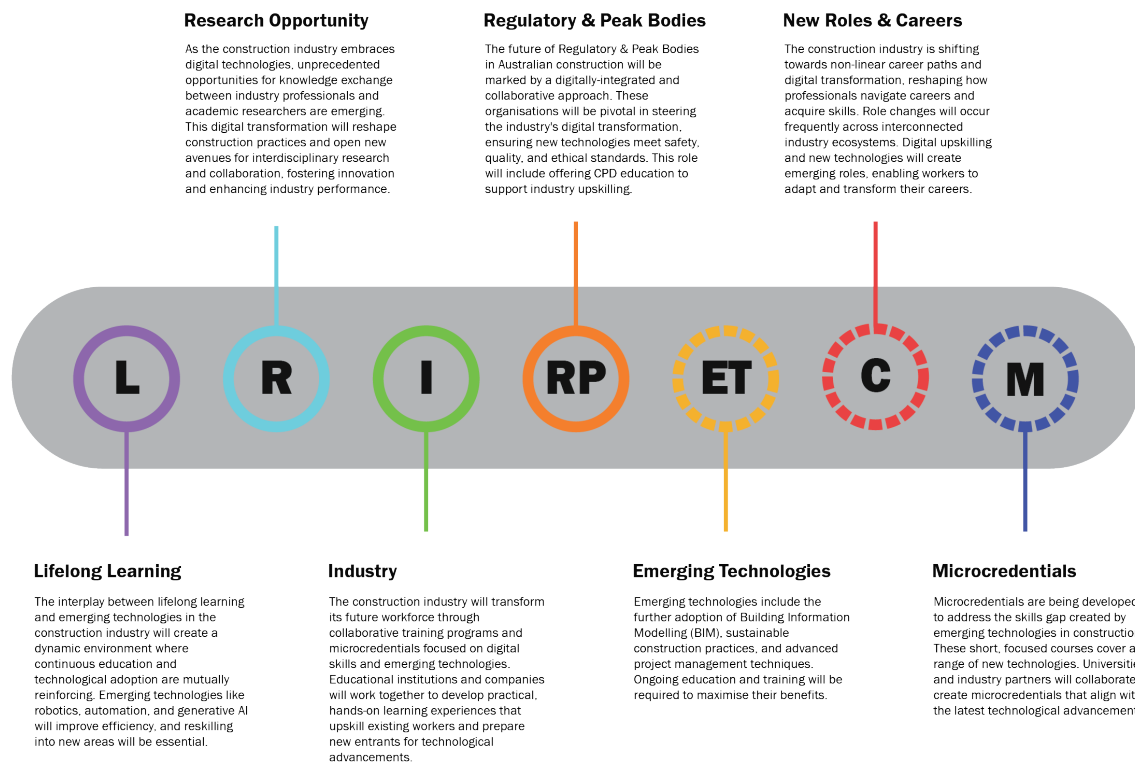


Figure 15. Interpreting the Future of Construction Education Network Map

The **Future of Construction Education Network Map** visually represents the evolving educational and career landscape in the Australian construction sector. Using the familiar analogy of a metro network, the map illustrates how learners and professionals can navigate diverse pathways, transition between roles, and upskill in response to industry change. Each "line" on the map represents a key theme or pathway in the future education ecosystem.

Future of Construction Education Network Map



Figure 16. Future of Construction Education Network Map, current conditions

Key Lines and Their Significance

1. Lifelong Learning Line (L)

- **Description:** This line represents the continuous journey of learning, from foundational skills to advanced expertise, supporting professionals at every career stage.
- **Implication:** Encourages a culture where ongoing education is the norm, not the exception, enabling adaptability in a rapidly changing industry.

Future of Construction Education Network Map



Figure 17. Future of Construction Education Network Map, emerging employment and research

2. Research Opportunity Line (R)

- **Description:** Connects students and professionals to research pathways, including honours, postgraduate research degrees, and industry-led innovation projects.
- **Implication:** Fosters innovation and critical thinking, ensuring the sector remains at the forefront of global best practice.

3. Industry-Integrated Loop (I)

- **Description:** Highlights programs and modules co-designed with industry partners, including work placements, apprenticeships, and real-world project experience.
- **Implication:** Bridges the gap between theory and practice, enhancing employability and ensuring graduates are job-ready.

4. Regulatory & Professional Bodies Line (RP)

- **Description:** Tracks the requirements for professional accreditation, licensing, and compliance with industry standards.
- **Implication:** Ensures education aligns with current regulations and professional expectations, supporting seamless credential recognition.

Future of Construction Education Network Map



Figure 18. Future of Construction Education Network Map, emerging technologies

5. Emerging Technologies Line (ET)

- **Description:** Focuses on integrating cutting-edge technologies-such as BIM, digital twins, AI, robotics, and sustainable construction practices-into curricula.
- **Implication:** Prepares learners for the digital transformation of construction, making them proficient in tools and systems shaping the industry's future.



- **Description:** Maps pathways for upskilling, reskilling, and transitioning into new or evolving roles, such as sustainability consultants, digital construction managers, and data analysts.
- **Implication:** Supports workforce mobility and adaptability, helping professionals pivot as new opportunities and roles emerge within the sector.

- **Description:** Represents a flexible, modular system of short courses and stackable credentials offered by universities, TAFEs, industry associations, and private providers.
- **Implication:** Enables targeted skill development, rapid upskilling, and recognition of prior learning, making education more accessible and responsive to industry needs.

Future of Construction Education Network Map



Figure 20. Future of Construction Education Network Map, microcredential ecosystem

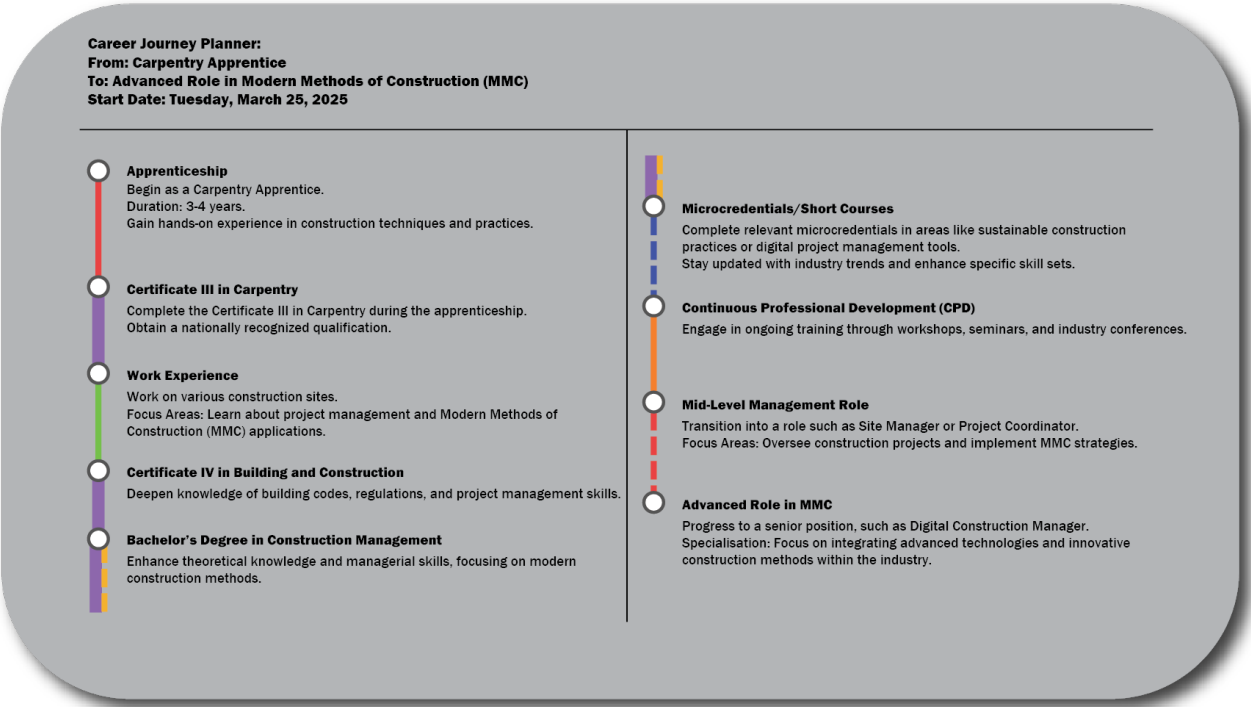


Figure 21. Career Journey Planner

Supporting the Map: Practical Recommendations

New Roles & Career Transition:

Develop clear, modular pathways that allow workers to transition smoothly between traditional and emerging roles. For example, a site supervisor could upskill in digital project management via targeted microcredentials, then transition to a digital construction manager role.

- **Integration of Emerging Technologies:**
Embed technology-focused modules (e.g., BIM, AI, robotics) across all qualification levels. Partner with tech providers and industry leaders to ensure content remains current and practical.
- **Microcredentials Ecosystem:**
Establish a national framework for microcredentials, ensuring portability and recognition across institutions and employers. Promote collaboration between education providers and industry to co-design microcredentials that address real workforce needs.

How to Use the Map

- **For Students:**
Identify entry points (e.g., diploma, certificate, or bachelor's) and plan a journey that incorporates industry experience, emerging tech skills, and opportunities for career advancement or transition.
- **For Professionals:**
Use the map to explore upskilling options, career pivots, or research opportunities. Follow the Microcredentials Ecosystem line for rapid, targeted learning that aligns with your career goals.
- **For Institutions & Industry:**
Collaborate to ensure educational offerings are interconnected, flexible, and aligned with industry needs. Use the map as a strategic tool for curriculum planning and workforce development.

The **Future of Construction Education Network Map** is more than a visual guide—it's a strategic framework for lifelong learning, career mobility, and industry innovation. By supporting new roles, integrating emerging technologies, and fostering a dynamic microcredential ecosystem, the Australian construction sector can build a future-ready workforce.

8. PROJECT FINDINGS AND OUTCOMES

"A unique, innovative and much needed course in Australia."

Project #66 was initiated in response to significant gaps in MMC education within the construction sector. Its key outcomes include the development of the Bachelor of Digital Construction and Management degree and the creation of strategic pathways for future educational transformation, as outlined in the Network Map.

Realised Impact

Holmesglen's new degree, the Bachelor of Digital Construction and Management, will commence in Semester 1 (2027) having received TEQSA approval. This course closes the gap at level 7 of the Australian Qualifications Framework (AQF). In doing so, it provides a Linchpin for program development above and below AQF 7, including a platform from which to build microcredentials.

Potential Impact

The potential impact of Project #66, the Future of Construction Education, is the ability to transform construction education in Australia to create a future-ready workforce. This includes supply chain readiness, addressing of skills shortages and increased industry capacity. The impact can be categorised into three main areas: closing the immediate skills gap at the bachelor level, promoting long-term systemic educational reform and informing future research.

1. Impact of the New Bachelor of Digital Construction and Management Degree

The development of the three-year Bachelor of Digital Construction and Management degree at Holmesglen Institute is the central, tangible outcome of Project #66. The degree is specifically designed to close the industry skills gap at the Australian Qualifications Framework (AQF) Level 7 by:

- **Focusing on High-Demand Skills:** The program offers six clusters focused on high-demand technical skills that are generally not currently provided as a single course by competitors. The curriculum highlights digitalisation, Industry 4.0 principles and innovation in product development.
- **Promoting Digital Competency:** Graduates are to be adept in utilising digital workflows to order to enhance construction planning, execution, and management, thoroughly integrating Building Information Modelling (BIM) and digital processes. The inclusion of 'Digital' in the title signals a commitment to preparing graduates for a digital transformation in the construction sector.
- **Industrialised Construction:** The course will equip students with expertise in the principles and applications of Modern methods of construction (MMC), Design for Manufacture and Assembly (DfMA) and off-site construction.
- **Sustainability and Ethics:** The program ensures graduates promote sustainability through knowledge of embodied and operational carbon, sustainable materials, and the principles of the circular economy.

Creating Job-Ready Graduates

The degree is designed to ensure graduates are prepared for immediate and effective industry engagement. Graduates will possess a comprehensive skill set blending technical proficiency (in

digital technologies and industrialised construction) with vital interpersonal skills (critical thinking, problem-solving, innovation, resilience, and ethical judgment).

Platform for Future Learning

The Bachelor of Digital Construction and Management course will act as a linchpin for program development above and below AQF 7. The program is strategically positioned to offer future microcredentials based on its subject streams. Once developed, these can address immediate industry needs and support modular/stackable credentials for existing workers seeking upskilling. The title, 'Bachelor of Digital Construction and Management, provides clarity for both students and employers about the career and employment pathways after graduation.

2. Impact of Project #66's Broader Educational Framework

Beyond the new degree, Project #66 established a transformative strategy designed to reform construction education landscape in Australia. By providing an actionable roadmap for transformation the project delivers a broader program development and framework that provides a vision and actionable pathway for education transformation in the construction and higher education sectors.

This educational journey framework maps an overarching educational pathway that supports multiple entry and exit points. This allows for fluid student transitions between certificates, diplomas, bachelor's degrees and postgraduate alternatives.

The framework includes practical recommendations to formalise industry, academia and regulator partnerships. This is intended to embed regulatory, policy, and compliance perspectives into educational programs through mechanisms like joint curriculum advisory panels.

The framework supports the development of clear, modular pathways (the New Roles & Career Transition Line) that allow workers to transition smoothly between traditional and emerging roles, such as upskilling a site supervisor into a digital construction manager via targeted microcredentials.

3. Policy and Future Research Impact

The project's findings provide foundational context and strategic direction for ongoing research and policy influence. Project #66's findings have the potential to feed into future Building 4.0 CRC projects. This includes upcoming initiatives focused on:

- MMC education frameworks for government providers.
- Analysing the workforce implications and training needs for widespread MMC adoption across the value chain (Project #102).
- Creating a purpose-driven VET qualification framework focused on MMC (Project #111).

Recommendations include Policy briefings for dissemination through various industry channels to maintain relevance and broaden the project's impact. Future research plans include further investigation of the skills gap, microcredentials development, and greater industry and educational connectivity are outlined in Chapter 9.

Gaps and Opportunities

The Bachelor of Digital Construction and Management aims to address clear knowledge, skills, and educational pathway gaps in the industry, the degree itself has several identified future needs, particularly regarding recognition and operational details

Accreditation and Recognition

The program is currently undergoing final development through Holmesglen's internal processes and is seeking external accreditation from the Tertiary Education Quality Standards Agency (TEQSA). Formal professional and industry recognition is not required for graduates to be employed in construction management or related roles, however seeking this recognition is a future step that would increase the program's value. The first formal accreditation from an industry or professional body (such as Building Smart Australasia, AIPM, AIQS, or RICS) is proposed to be sought seven years after the course commencement.

Structural and Pedagogical Details

Work Integrated Learning

Work Integrated Learning (WIL) is recognised as a vital component of the course. The research recommends embedding work placements and industry collaboration to strengthen practical skills and enhance employability. While the current structure incorporates WIL through the Year 3 Capstone unit, additional opportunities, such as local case studies, site visits, and work placements, can be introduced as the course becomes established.

Adaptation to Emerging Technologies

It is recommended that the course curriculum be adapted continuously to emerging trends and technologies. Maintaining close ties with external academics and industry partners is recommended for maintaining course relevance and content updates. Learning outcomes and assessment tasks will need to be flexibly designed to manage future industry and technological developments. Ongoing review and inclusion of new digital assets and emerging virtual design workflows are recommended to ensure the course keeps pace with emerging technologies. Continuous course evolution and maintenance will be informed by ongoing engagement with industry and future student alumni. This is recommended to maintain the currency of the program content and its marketing potential.

Development of complementary educational resources

Strengthening pathways to and from the bachelor course is essential. This will include maintaining an oversight of emerging VET qualifications that serve as pathways into the course. Linking into new MMC courses up and down the Learning Lifeline will embed the course in the new schema of digital and industrialised construction education resources.

Future Educational Offerings

The creation of future microcredentials is recognised as a key step in "Closing the Gap" and represents a significant opportunity for future growth. While this work sits outside the scope of this current project, the course structure has been intentionally designed with micro-credentials pathways in mind and embedded across the subject streams. Future research, as outlined in Chapter 9, will further investigate identified skills gap.

Enhance industry and educational connectiveness

While the project successfully identified and addressed a critical market gap at the graduate level (AQF 7), it currently remains a stand-alone MMC resource. To complete the overarching educational framework, complementary resources at additional AQF levels will be required. There is the potential to broadening the dissemination of the project materials to other providers, subject to appropriate management of Intellectual Property (IP). Further development of new educational offerings will enhance industry and strengthen educational connectiveness

9. FUTURE RESEARCH PLANS

Future research projects, educational pathways, research dissemination and broadening the projects impact.

Future Building 4.0 CRC Research Projects

Project 66 has the potential to contribute to the research and development of several Building 4.0 project proposals currently in various stages of development: an MMC education framework for government providers, the productivity of off-site manufacturing versus on-site construction (Project #102) and #111 MMC Competency Framework for VET Sector.

Project #95 The Homes NSW MMC Project

The aim of the project is to develop strategies and methods to utilise modern methods of construction (MMC) in Homes NSW projects. The intent of the program is to deliver more social housing with increased benefits for Homes NSW and their tenants. Stream 3: Change Management and Housing Delivery will provide educational initiatives to ensure the industry can understand how to grow and adapt, and skills and training initiatives to upskill the workforce who will deliver new housing.

Project #102 Skills and Training Implications of Modern Methods of Construction: Across Design, Manufacture, and Assembly (with BuildSkills Australia)

The global construction industry has faced a persistent productivity crisis. To address this challenge, the industry is moving towards Industrialised Construction (IC), also known as Modern Methods of Construction (MMC). While the technical and commercial aspects of MMC have been well studied, there is still a significant gap in understanding the required workforce transformation to effectively implement these methods. Project #102 aims to address this gap by analysing the workforce implications, training needs, and skill development essential for widespread MMC adoption across the Australian built environment value chain.

Project #111 VET Qualifications System and Training Framework for Modern Methods of Construction

The imperative to transform the construction industry through digitalisation and modern methods of construction (MMC) is widely acknowledged in industry and policy discourse, aiming to achieve higher productivity. However, their adoption remains limited, with 'traditional' site-built construction practices still prevalent. Current industry practices often lack the integrated and collaborative approaches vital for effective MMC implementation. This challenge mirrors the situation within the Vocational Education and Training (VET) sector. Current VET programs often provide generic training, lacking specific content related to MMC and its application across the value chain. This project will explore the suitability of current VET training programs in relation to MMC and ascertain whether new training directions are needed to bridge gaps in skills and training at the trades and para-professional levels. Ultimately, the goal of this project is to create a purpose-driven VET qualification framework focused on MMC.

Project #117 Graduate Certificate in Sustainable Construction

Addressing sustainability challenges in the building and construction industry requires a fundamental transformation in how buildings are conceived, designed, and constructed. This transformation depends on a workforce equipped with the knowledge, skills, and capabilities needed to navigate a climate-affected world and build long-term resilience through targeted education and training. In response, Project #117 aims to develop a Graduate Certificate for Holmesglen Institute that supports the shift to sustainable construction.

Project Proposals

Nationally Coordinated Approach

The network map underscores the need for a nationally coordinated approach to the development and delivery of MMC courses and upskilling initiatives. Currently, numerous organisations across TAFEs, universities, and government bodies are independently developing similar MMC related training materials and microcredentials. This fragmented approach risks the duplication of effort, inefficient use of resources, and missed opportunities for alignment. A working group led by Building 4.0 CRC was established in September 2025 to support the development of a unified framework for MMC workforce capability, fostering collaboration across education, industry, and government sectors. This working group includes membership from TAFEs, universities, peak bodies, and government, meeting quarterly.

Research Dissemination

The research has been disseminated through subsequent research projects in Building 4.0 CRC listed on page 63 of this report.

The MMC education framework has been presented in numerous public presentations, including online webinars for peak bodies and industry groups, including Sydney Build Expo 2025, the Property Council of Australia Constructonomics Conference 2025, and the AIA CPD series 2026, among others.

The outcomes of Project 66 were featured as part of a CRC Knowledge Share event held on 25/3/2025 at Holmesglen Institute with panellists including BuildSkills Australia and AG Coombs. Additionally, the work was shared as a masterclass convened for Infrastructure NSW in November 2025.

Project Proposals

Speculative research opportunities for further investigation of the skills gap, microcredentials development and industry-educational sector connectivity including:

- Building on #66 to further investigate Skills Gap
- Future Skills and training continuation as an important focus area for CRC
- Research targeting Micro-skills and Microcredential development
- Research into greater industry and educational connectiveness.

Project Publications

A paper was submitted and published in the proceedings of the World Sustainable Built Environment conference 2026 (WSBE 2026) titled 'Mapping the Modern Methods of Construction (MMC) Educational Skills Gap in Australia.' Jean-Paul Rollo presented at this conference in June 2026.

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ATTACHMENT 1: SEMI-STRUCTURED QUESTIONNAIRE

Background

- Could you briefly describe your role and experience in the field of construction and / or education?
- How do you perceive the current state of construction education at both the diploma and degree levels in Australia/Your country?

Understanding the Need for a New Program

- In your opinion, what are the key skills and knowledge areas missing in current construction education programs?
- Can you provide examples of emerging trends in the construction industry that should be integrated into the new program?

Benchmarking Against Global Standards

- Are you familiar with any international construction education programs that could serve as a benchmark for our new program?
- What aspects of these international programs should be adapted or adopted to fit the Australian context?

Framework Development

- What are your thoughts on creating an educational pathway from a diploma level through to a post-professional master's degree in construction?
- What key components should be included in the curriculum to ensure a robust and comprehensive education in construction?

Industry Relevance and Future-Proofing

- How can we ensure that the program remains relevant to the evolving needs of the construction industry?
- What are your recommendations for incorporating industry partnerships, internships, or practical projects into the program?
- How can we prepare students for future challenges and technological advancements in construction?
- How would you profile a graduate ready for the future Construction Industry? (Beyond the current typical role of architects, construction managers, fabricators, other construction professionals and construction workers)

Challenges

- What challenges do you foresee in developing and implementing this new program?

Closing Questions

- Are there any other suggestions or insights you would like to offer regarding the development of a Future of Construction program?
- Who else would you recommend we speak with to gain further insights into the development of a Future of Construction program?

Note:

- This is intended to be a Semi-structured interview. The questions are designed to encourage detailed responses and allow the interviewee to share insights and perspectives; the interviewer will be flexible during the interviews and follow up on interesting points raised by the interviewees.

ATTACHMENT 2: DESKTOP REVIEW OF LOCAL COURSES

Attachment 2.0 Desktop Review Local Courses

Revised: 09/05/2024

Institution/ organisation	RMIT University	University of Tasmania_ Open Universities Australia (OUA)*	Curtin University_OUA *	Victoria University _ Footscray Park	Deakin University	University of Melbourne	Swinburne University of Technology	Torrens University_OUA*
Program Title	Bachelor of Construction Management (Honours). Minor: Smart Construction	Construction Project Management (Single Unit) Construction Project Management (Diploma of Construction Management)	Bachelor of Applied Science (Construction Management)	Bachelor of Construction Management (Honours)	Bachelor of Construction Management (Honours)	Structural Design of Prefab and Modular Building Construction	Introduction to Prefab Modular Design and Construction	Bachelor of Architectural Technology
Program Code	Undergraduate BH114	Undergraduate TAS-ZAX106 2024	Undergraduate CUR_BAS_DEG	Undergraduate NHCM	Undergraduate	Undergraduate Short Course	Undergraduate Short Course	Undergraduate TUA-ART-DEG
Location	Undergraduate BH114P24 Melbourne City	Undergraduate TAS-CMG-DIP-2024			Geelong: Waterfront In Person	Parkville, Melbourne Online	Hawthorn, Victoria Online	Sydney, Melbourne, Brisbane, Online, On Campus, Blended
Delivery Mode	On Campus				Full-Time 4 years, accelerated option	6 Weeks 12 Hours	6 Weeks 15 Hours 5 Sessions	Full-Time 3 years 24 Subjects (20CU+4 ES)
Duration	Full-Time 4 years				32 Subjects			
Delivery Structure	32 Subjects							
Fees			\$28,558.00		\$9,011 for 1 yr. full-time - Commonwealth Supported Place (HECS)	\$750.00	\$500.00	\$84,840.00
Overseas/ Domestic	Domestic International		Domestic International		Domestic International	Domestic	Domestic	Domestic/ International
Work Integrated Learning					Industry placement as an elective	CPD		
Industry endorsement	Accredited by professional bodies including Royal Institution of Chartered Surveyors (RICS), Chartered Institute of Building (CIOB), The Australian Institute of Quantity Surveyors (AIQS) and Australian Institute of Building (AIB)			Building Compliance Minor OR Quantity Surveying Minor	Australian Institute of Building (AIB), the Australian Institute of Quantity Surveyors (AIQS), the Chartered Institute of Building (CIOB) and the Royal Institution of Chartered Surveyors (RICS)			
Subjects/ Modules	Introduction to Buildings, Introduction to Property, Project Management Concepts, Communications for Built Environment Professionals, Introduction to Construction Processes, Property and Capital Markets, Techniques for Project Planning and Management, Managing for Sustainability, Building Measurement and Estimating, Building Science, Construction Technology 1, Production Planning and Management, Introduction to Built Environment Law, Building Services, Construction Contract Law, Cost Planning and Tendering, Integrated Building Information Modelling, Construction Contract Administration, Construction Technology 2, Research Methods for the Built Environment. <i>Minor: Smart Construction Subjects</i> Building Information Modelling, Structural Optimization and 3D Printing, Digital Transformation for Sustainable Construction, Introduction to Modular Design and Construction	Complete your construction management studies with a course on project management. You'll learn the tools and processes used in the industry. Write up a construction project delivery plan as part of your assessments.	See: CUR_BAS_DEG SUBJECTS: Plus: Low rise construction, Building Surveying, Construction contracts and law, Introduction to Management in Construction, High rise construction.	Maths for builders, Basic Structure mechanics, Structural Principles in Construction, Fundamentals of Building Construction, Building Science, Measurement and estimating, Built Environment Communications and skills, building documentation., During development and compliance., Building Contract documentation, and construction, surveying., High rise development and compliance., Construction site operations. Instruction economics, Professional estimating. Project management practice. Construction law. Research principles and practices. Procurement management, Cost planning and control, Construction management, Built Environment Project 1, construction., Note Environment Project 2, Building compliance, Quantity surveying.	Construction Finance, Building Safety, Building Materials Science, Construction Projects 1, Safety Induction Program, Academic Integrity Module, Career Tools for Employability, Building Economics, Introduction to Building Information Modelling., Construction and Structures 1, Construction Projects 2, Building Measurement, Contract Administration 1, Project Management 1, Construction and Structures 2, Building Cost Planning, Contract Administration 2, Building Environmental Studies, Construction and Structures 3, Project Planning and Scheduling, Project Management 3, Quantity Surveying Practice, Contract Administration 3, Contract Administration 3, Professional Practice, Introduction to Construction Research, Building Development Appraisal, Building Development Appraisal, Construction Research Thesis, Built Environment Integrated Research	Subject List not available online	Introduction to prefab modular construction, Tutorial: Basic concept of modular design, Precast structures and the importance of AS3850, Use of precast elements and joints in prefab modular, Tutorial: Precast lifting/joint design, Use of timber elements in prefab construction, Introduction to lifting, transportation and placement, Tutorial: Lifting and transportation and placement, Case Studies: Steel and timber prefab buildings, Case Studies: Precast Prefab Buildings, Future of prefab modular design and construction, Case Study: Timber modular building, Research work on prefab modular construction	Design context. Design drawing. Digital environments and human scale, History of Architecture, Interior design, and decoration. Principals of structure., Architecture Studio 1, Immersive digital experience, Material Science and Sustainability. Theories of space and place. Systems and documentation 2 commercial, Computational architecture., Problem-based learning Studio, The building as an Organism. Architecture Studio 2, Social, Enterprise. BIM: Sustainable Building light cycles, Work integrated, learning, Systems and Documentation 3, Architectural Capstone part A. Architectural Capstone Part B.
Program purpose/ marketing description	Help construct our world. Learn to manage contractors, budgets and stakeholders, understand urban planning, and work in commercial and residential sectors. Construction management is not just about building sites: It's about the bigger picture. Develop the skills to manage people and resources to ensure the safe delivery of buildings. Throughout your learning, you will critically evaluate and apply construction management concepts and methodologies, extending your knowledge in key areas such as building design, building services, construction methods and processes, procurement and supply chains, sustainability, economics and resource management.	Complete your construction management studies with a course on project management. You'll learn the tools and processes used in the industry. Write up a construction project delivery plan as part of your assessments.		Build your skills and confidence to take a leading role in large-scale building and civil-engineering projects with a Bachelor of Construction Management (Honours) at Victoria University. Get job-ready to manage residential, commercial and industrial construction projects with this construction management degree that's closely connected to real-world industry. You'll gain valuable expertise to take on roles overseeing the building process, from design to development, construction and operation	Dreaming of running diverse building projects with a professionally recognised qualification? Develop an in-depth understanding of the business of construction, from economics and law to technology. Deakin's Bachelor of Construction Management (Honours) equips you with market-ready skills for construction management, quantity surveying and property development. Work confidently across projects large and small, with a strong focus on practical learning, you will develop the initiative and ability to hit the ground running.	Gain the specialist skills sought by employers in the construction sector for designing prefabricated buildings. Be introduced to the principles of prefabricated and modular building construction and its structural design. With the aid of industry-recognised software, you will analyse practical case studies to enhance your understanding of crucial concepts, including conceptual design, hinge assembly, DfMA design, and integrated design of timber and steel prefabricated structural systems. Learn basic concepts behind the assessment of loads and support conditions that apply to prefabricated units during their transportation, lifting and handling. Apply these concepts to practical scenarios to ensure minimum damage to prefabricated units during all stages of manufacturing and installation	Introduction to prefabricated modular construction, Tutorial: Basic concept of modular design, Precast structures and the importance of AS3850, Use of precast elements and joints in prefabricated modular, Tutorial: Precast lifting/joint design, Use of timber elements in prefabricated construction, introduction to lifting, transportation and placement, Tutorial: Lifting and transportation and placement, Case Studies: Steel and timber prefabricated buildings, Case Studies: Precast Prefab Buildings, Future of prefabricated modular design and construction, Case Study: Timber modular building, Research work on prefabricated modular construction	A Bachelor of Architectural Technology prepares you to design and document innovative buildings using new and emerging digital technologies. The first course of its kind in Australia, you will gain expertise in computer-aided design (CAD) and building information modelling (BIM), giving you the skills required for a successful career in the built environment industry. The course will teach you the architectural fundamentals required to design high performing buildings, including concept development, digital modelling and construction documentation. Throughout the course, you will learn the core digital, material and structural principles applied to designing and documenting buildings to industry specification.
Weblink: (Accessed 13/01/24)	https://www.rmit.edu.au/study-with-us/building/construction-management	Construction Project Management at University of Tasmania Open Universities Australia	Bachelor of Applied Science (Construction Management) Open Universities Australia	Bachelor of Construction Management (Honours) Victoria University (vu.edu.au)	Bachelor of Construction Management (Honours) Deakin	Structural Design of Prefab and Modular Building Construction - Short Course. (unimelb.edu.au)	Introduction to Prefab Modular Design and Construction Swinburne	Bachelor of Architectural Technology Billy Blue at Torrens University

NOTES

1. OUA* Denotes Open University Australia, <https://www.open.edu.au/how-oua-works>

2. Costs as of January 2024

3. Websites accessed via desktop reviewed 10/01/2024, 11/01/23, 15/01/23

4. Key desktop search phases: Study Building Design, Building and Construction, New Building Technologies, Prefabricated Building Methods, and Architectural Design.

5. Additional Options: Micro courses offered by Australian Universities that can be mixed and matched towards a degree, OpenCredentials Framework, Micro credential creation, accreditation as per AQF and credits transfer See: OpenCredentials Framework <https://solutions.openlearning.com/opencreds>

6. Green Building Council of Australia, Courses on sustainability, not included

Swinburne University of Technology	Swinburne University of Technology	Swinburne University of Technology (Hawthorn)	Victoria University _ Polytechnic Sunshine	Victoria University _ Polytechnic Sunshine	Victoria University _ Footscray Park	Victoria University _ Footscray Park	RMIT University	RMIT University
Associate Degree in Applied Technologies (Majoring in Advanced Manufacturing)	Associate Degree in Applied Technologies (Majoring in Building Information Modelling)	Bachelor of Design (Architecture)	Diploma of Building and Construction (Building)	Advanced Diploma of Building Design (Architectural)	Bachelor of Building Design	Bachelor of Construction Management (Honours)	Advance Diploma of Building Design (Architectural)	Diploma of Building and Construction (Building)
Associate Degree AB-APTEC Hawthorn, Victoria	Associate Degree AB-APTEC Hawthorn, Victoria	BA-ARC Hawthorn, Victoria	CPCS0220 Sunshine, Victoria On Campus with eLearning, Online Full-Time 2 years	Vocational 22627VIC Sunshine, Victoria On Campus with eLearning Full-Time 2 years 22 Core Units	Undergraduate NBBD Footscray Park On Campus Full-Time 3 years	Undergraduate NHCM Footscray Park On Campus Full-Time 4 years	Vocational 226227VIC Code: C6188 Melbourne, City On Campus Full-Time 2 years	Vocational CPCS0220 Code: C5415 /C5415BU Melbourne, City and Bundoora On Campus Full-Time 2 years 27 Subjects (24 CS + 3ES)
Full-Time 2 years 16 Subjects (3CU + 12-13MU)	Full-Time 2 years 16 Subjects (3CU + 12-13MU)	Full-Time 3 years 19 Subjects (15CU + 3ES)						
\$17,896.00	\$17,896.00	\$26,844.00	\$29,400 (Full Fee)				\$29,400 (Full Fee)	\$27,000 (Full Fee)
Domestic Only	Domestic Only							Domestic
				Register as a drafting practitioner through the Victorian Building Authority (VBA)	Victorian Building Authority (VBA), Building Designers Association of Australia (BDAA)			
Working in Industry 4.0 (CU), Cyber-Physical Systems Integration (CU), Innovation for Industry 4.0 (CU), Artificial Intelligence for Industry 4.0 (MU), CAD/CAM and Engineering Materials (MU), Industrial Networking and Cloud Computing(MU), Object Oriented Programming: Industrial Control Systems (MU), Digital Control Systems Engineering and Electrical Skills for Industry (MU), Software Tools for Industry 4.0 (MU), Advanced Digital Control Systems (MU), Advanced Electrical Machines (MU), Predictive Engineering Analytics (MU), Robotics and Digital Twin(MU), Cyber Security and Cloud Services (MU), Distributed Control in a Smart Factory (MU) * CU= Core Unit, MU= Major Unit	Working in Industry 4.0 (CU), Cyber-Physical Systems Integration (CU), Innovation for Industry 4.0 (CU), BIM Frameworks (MU), Modelling and Information Management Basics (MU), Project Simulation 1: BIM for Design and Build (MU), Building Organisational Capability (MU), Introduction to Digital Asset Management (MU), Modelling and Information Management Basics 2 (MU), Leadership and Change Management (MU), Driving Collaboration in Projects (MU), BIM standards in Depth (MU), Digital Fabrication and Construction (MU), BIM Legal and Contractual (MU), Developing a Strategic BIM Use (MU), Management, Workplace Standards and Training * CU= Core Unit, MU= Major Unit	Contexts of Architectural History, Introductory Design Studio, Construction 1: Building systems and materials, Interior architectural communications, Architectural Design Studio Communications (Cross- cultural contexts), Interior design Digital documentation., Architectural design studio (Social economic contexts) Construction 2: Building services and documentation packages, Architectural Design Studio 3 (construction) Construction 3: sustainability, Elective, Work experience in Industry A, Integrated professional placement A- design, Work experience in Industry B, Integrated Professional placements Placement B- Design.	SUBJECTS: Manage business risks, Lead WHS, Risk management, Apply building codes and standards to the construction process for class one and class 10 buildings, Select, prepare and administer a Construction contract, Identify and produce estimated costs for building and construction projects., Produced labour and materials schedules for ordering, Identify and produce estimated costs for building and construction projects, Sure. Advise. site communication and administration processes For building and construction projects. Apply legal requirements to building and construction projects. Apply structural principles to residential and commercial constructions, Read and interpret plans and specifications, Prepare and evaluate tender documents, Prepare simple building sketches and drawings, Apply site surveys and set out procedures to building and construction projects, Apply building codes and standards to the construction process for Class 2 to 9. Type C buildings, Applied building codes and standards to the construction process for	SUBJECTS: Research and develop business plans, Live project risk management techniques, Prepare to work safely in the construction industry. Undertake site survey and analysis to inform design process. Apply structural and construction technology to the design of residential buildings, Apply structural and construction technology to the design of commercial buildings, Comply with relevant legislation in the design of residential buildings, Comply with relevant legislation in the design of commercial buildings. Safe, Design safe buildings. Design sustainable buildings. Integrate services layout into design documentation. Produce preliminary and working drawings for residential buildings. Produce preliminary and working drawings for commercial buildings, Select Construction materials for building projects, Provide design solutions for residential buildings, Integrate digital applications into residential architectural workflow, Integrate additional applications into commercial architectural workflows.	Maths for Builders, Basic structural mechanics, Structural principles in construction, Fundamentals of building Construction, Building science, Measurement and Estimating, Built environment communications and skills, Building design documentation, Architectural history and analysis, Building Contract documentation, Built Environment 1, Architectural design and theory, Risk and safety management, Built Environment 2, Building systems and services. Building Development and compliance, Project management practice. Residential sustainable design, Urban design and development, Building Design Studio 1, Building Services Management, Complex Construction, Commercial sustainable design, Building Design Studio 2.	Maths for builders, Basic Structure mechanics, Structural Principles in Construction, Fundamentals of Building Construction, Building Science, Measurement and estimating, Built Environment Communications and skills, building documentation., During development and compliance., Building Contract documentation, and construction, surveying., High rise development and compliance., Construction site operations. Instruction economics, Professional estimating. Project management practice. Construction law. Research principles and practices, Procurement management, Cost planning and control. Construction management, Built Environment Project 1, construction., Note Environment project 2, Building compliance, Quantity surveying.	Legislation - residential buildings, Construction Materials, Design Sustainable Buildings, Architectural Design, Structural and construction technology - Residential Buildings, Drawings - Residential Buildings, Residential Architectural Workflows, Commercial Architectural Workflows, Bushfire Attack Level (BAL) assessment, Site Survey and Analysis, Design solutions - residential buildings, Design solutions - commercial buildings, Design safe buildings, Services layout - design documentation, Legislation - commercial buildings, Structural and construction technology-commercial buildings, Drawings - commercial buildings, Work safely in the construction industry, Research and develop business plans, Project risk management techniques Architectural project administration, Complex architectural projects,	Estimated costs for building and construction projects, Costing systems - complex building projects, Legal obligations of construction contractor, Building sketches and drawings, Prepare and evaluate tender documentation, Produce labour and material schedules for ordering, Manage building and construction contractors, Building codes and standards for Type B Construction, Legal requirements for construction projects, Codes and standards for Class 2 to 9 Type C buildings, Structural principles up to 3 storeys, Interpret plans and specifications, Site communication and Administration processes, Technical and legal reports, Planning of on-site construction., Select prepare and administer contracts, Environmental management practices, Structural principles, Manage business risk, Site surveys and set-out procedures, Manage construction, WHS risk management, Building codes and standards, Manage project quality, thermally efficient and sustainable structures, Energy efficient building methods and strategies
With three specialisations to choose from including: Advanced Manufacturing, Civil Infrastructure & Building Information Modelling, you'll receive training that turns you into a technical expert within the engineering and technology sector. You can study on campus at Swinburne, while also spending time with an industry partner to ensure you receive state-of-the-art coaching. Our Associate Degree in Applied Technologies is an engineering and digital technologies course developed in conjunction with our industry partners.	With three specialisations to choose from including: Advanced Manufacturing, Civil Infrastructure & Building Information Modelling, you'll receive training that turns you into a technical expert within the engineering and technology sector. You can study on campus at Swinburne, while also spending time with an industry partner to ensure you receive state-of-the-art coaching. Our Associate Degree in Applied Technologies is an engineering and digital technologies course developed in conjunction with our industry partners.	Design has the power to shape our understanding of the world and our experience within it. Our Bachelor of Design will arm you with broad design skills in typography, brand and identity design, and more. Make your degree custom-fit by choosing a future-focused major. Emerge ready to transform lives and empower society towards a brighter (and even more beautiful) future.	Become a highly-skilled building project manager with a Diploma of Building and Construction (Building) CPCS0220 at Victoria University (VU). Gain specialist skills and knowledge from experienced industry professionals and equip yourself to run a successful construction business in residential, industrial or commercial. At VU, everything you learn in your building and construction course has direct links to the real world, from the latest industry-standard knowledge to practical on-site projects	You'll become proficient in the design, presentation and documentation process for residential, industrial and commercial buildings. With this qualification and the required industry experience, you will be able to register as a drafting practitioner through the Victorian Building Authority (VBA)(external link).	In this unique building design degree, you'll use innovative processes and practices of an architectural design studio to solve problems creatively, and determine solutions for a better future. Modern computer labs, design studios, site visits and interaction with industry practitioners will take you into 'real life' situations with industry briefs. You'll also learn about the cultural, social, technical and sustainable issues that are associated with the built environment	Build your skills and confidence to take a leading role in large-scale building and civil- engineering projects with a Bachelor of Construction Management (Honours) at Victoria University. Get job-ready to manage residential, commercial and industrial construction projects with this construction management degree that's closely connected to real-world industry. You'll gain valuable expertise to take on roles overseeing the building process, from design to development, construction and operation	Make your mark as an architectural technician, working in building design offices and architectural practices. Focus on the practical and technical application of design skills, and create innovative, sustainable designs for domestic and commercial-scale building projects. Develop your understanding of building design, construction techniques and technologies, building and related legislation requirements, documentation techniques and standards, space planning, materials and properties, historic periods and contemporary styles. The program is underpinned by the principles of sustainability. Visual technology and communication skills underpin the presentation aspects of working as a building designer. You will work with computer-aided design (CAD), Revit, Photoshop and other	Learn about the planning, coordination, and control of medium-rise and wide-span building projects. Construction is not just about building sites, but about building a bigger picture: the planning, coordination, and control of a project from inception to delivery, in this diploma, you'll examine the principles, techniques and regulations of the building and construction industry for all types of medium-rise and wide-span buildings up to 25 metres high. This practical curriculum incorporates hands-on work and project-based learning. You'll experience many aspects of building projects and understand how they all relate to each other. You'll go on site excursions to gain hands-on field experience which will include visits to residential and commercial construction projects
Associate Degree of Applied Technologies, majoring in Advanced Manufacturing Swinburne	Associate Degree of Applied Technologies, majoring in Building Information Modelling Swinburne	Bachelor of Design (Architecture) Swinburne	Diploma of Building and Construction (Building) CPCS0220 Victoria University (vu.edu.au)	https://www.vu.edu.au/courses/advanced-diploma-of-building-design-architectural-22627vic?gad_source=1&gclid=CiWkCAIAkp61bB85EIwANTCv1OTgDvYXQnL1l1m7K7nrrSTdxvC7iur_m6-Ai-	https://www.vu.edu.au/courses/bachelor-of-building-design-nbbd	Bachelor of Construction Management (Honours) Victoria University (vu.edu.au)	https://www.rmit.edu.au/study-with-us/levels-of-study/vocational-study/advanced-diplomas/advanced-diploma-of-building-design-architectural-c6188	https://www.rmit.edu.au/study-with-us/levels-of-study/vocational-study/diplomas/diploma-of-building-and-construction-building-c5415

RMIT University	Curtin University_OUA *	Curtin University_OUA *	Curtin University_OUA *	University of South Australia_OUA *	University of NewCastle_OUA *	University of Tasmania_OUA *	University of Southern Queensland_OUA *	The University of Sydney
Master of Energy Efficient and Sustainable Building	Undergraduate Certificate in Architecture	Bachelor of Applied Science (Architectural Science)	Bachelor of Applied Science (Construction Management)	Bachelor of Construction Management (Honours)	Bachelor of Construction Management (Building)	Diploma of Construction Management Open Universities Australia	Bachelor of Construction (Honours) (Construction Management)	Graduate Certificate/ Graduate Diploma/ Masters in Architectural Science (High Performance Buildings)
Postgraduate Code: MC209 Melbourne, City On Campus Full-Time 2 years 15 Subjects	Undergraduate CUR-HAR-CTF	Undergraduate CUR_BAS_DEG	Undergraduate CUR-CME-DEG-2024 Perth, WA	Undergraduate USA-CMH-DEG	Undergraduate UON-CMT-DEG NewCastle, NSW On Campus, Online	Undergraduate TAS-CMG-DIP	Undergraduate USQ-CHM-DEG-2024	NBBB
	Online Full-Time 6 months 4 Subjects	Online Full-Time 3 years 24 Subjects	Online Full-Time 4 years 31 Subjects (29 CU + 2MS)	Online Full-Time 4 years 32 Subjects (27CU + 5ES)	Full-Time 4 years 32 Subjects	Online Full-Time 1 year 8 Subjects (6 Core, 2 Electives)	Online, On Campus Full-Time 4 years 32 Subjects	On Campus Full-Time 1 year 24 credit points/ 48 credit pts/ 72 credit pts
\$32,640	\$5,211.00	\$28,558.00	\$37,463.00	\$36,714.00	\$34,240.00	\$10,790.00	\$35,792.00	
		Domestic	Domestic					
Thermodynamics and Heat Transfer for Building Science, Building Systems, Sustainability in the built environment: A focus on building and design, Introduction to Project Management, Research Design and Methods, Sustainable Building Technologies, Energy Moisture and Airflow in Buildings, Project Management Techniques, Building Modelling and Simulation, Building Sustainability Assessment, Sustainable Facades and Materials, Research Investigation 1, Sustainable Building Design Project, Research Investigation 2, Sustainable Building Investigation, Managing Sustainable Building Projects, Evaluating and Managing Project Risk, Information and Technology Management, Sustainability Leadership, Sustainable Energy Systems and Design, Shape - Multidisciplinary Projects in the Built Environment,	Architecture and Interior Architecture Methods 1A - Analogue Literacy, Sustainability and Structures in Architecture, Reading Architecture Globally Academic and Professional Communications, Architecture and Interior Architecture Design Studio 1 - Small Structures, Architecture and Interior Architecture Methods 1B - Digital Literacy, Architectural Science in Context	Academic and professional communications. Architectural, Architecture and interior architecture methods 1A Analog literacy., Sustainability and structures in architecture. Rating architecture globally., Architecture and Interior Design Studio One Small Structures., Architecture and Interior Methods 1B Digital Literacy. Architectural science and context., Architectural methods to a digital fabrication.' Architectural Design Studio 2B Regional Studio.' Architectural methods to be information visualisation.' Architecture, history and identity., Designed Studio 2A Residential topology and grammar., Architectural Design Studio 3A Multi-Residential. Architectural Methods 3A Digital Futures., Environmental and building systems in architecture. Urban Contexts, Building Information Modelling in Architecture. 20th and 21st century. Architectural theories.	Academic and Professional Communications, Architecture and Interior Architecture Methods 1B - Digital Literacy, Low Rise Construction, Introduction to Management in Construction, Structures, High-rise Construction, Building Construction Measurement, Health, Safety and Quality in the Built Environment, Construction Plant and Equipment, Specialised Construction, Building Services, Building Information Management and Modelling, Building Surveying, Construction Estimating and Cost Planning, Construction Planning and Scheduling, Cost Management, Virtual Design and Construction, Sustainable Construction Practices in Building and Infrastructure, Construction Contracts and Procurement, Design and Built Environment Research Methods, Project Development and Appraisal, Integrated Construction Project 1, Facilities and Asset Management, Contract Administration, Engineering Measurement, Research in Professional Practice in Construction, Integrated Construction Project 2	Introduction to Construction Management, Construction Communication, Construction 1, Construction Materials, Introduction to Construction Business Management, Structures 1, Introduction to Contract Administration, Elective 1, Construction Scheduling, Construction 2, Quantity Surveying Practice 1, Contract Administration, Structures 2, Building Estimating, Building Services, Construction Environmental Science, Development Regulation, Construction 3, Project Appraisal, Construction Cost Planning, Construction Operations and Safety, Fire Technology, Building Surveying, Advanced Contract Administration, Integrated Project, Elective 2, Research Theory and Practice, Elective 3, Construction Management Honours Research Project A, Elective 4, Construction Management Honours Research Project B, Elective 5, Construction Business Management, Advanced Construction Management,	Construction Technology, Construction Ecology, Digital Communication in the Built Environment, Country Led Practice in the Built Environment, Construction Law and Legislation, Building Codes and Compliance, Construction Technology, Sequencing and Representation, Construction Management Fundamentals, Measurement of Building Works 1, Health and Safety in Built Environment, Maintenance Services and Rehabilitation, Economics of the Construction Industry, Cost Planning and Estimating, Construction Procurement and Tendering, Work Integrated Learning in the Built Environment, Advanced Construction Technology, Performance and Sustainability of the Built Environment, Evidence-based Research for the Built Environment, Construction Project Planning, Development Economics and Facilities Management, Infrastructure Development, Building Fire Safety and Compliance, Contract Administration, Measurement of Building Works 2, Construction Technology and Services, Built Environment Research Project,	SUBJECTS: Leadership and Communication in Construction, Legislation and Standards in Construction, Managing Contracts, Construction Cost Management, Stakeholder and Risk Management in Construction, Construction Project Management. Managing People (ES), Financial Decision Making(ES), Lean Thinking (ES), Quality Management (ES), *(ES)= Elective Subject	Introduction to Engineering and Built Environment Applications, Introductory Engineering Mathematics, Human Capabilities for Business, Introduction to Construction Management and the Built Environment, Technology Sustainability and Society, Introduction to Engineering Design, Engineering Mathematics, Applied Mechanics, Construction Engineering, Corporate Finance, Job Organisation, Engineering Statics, Spatial Science for Engineers, Engineering Materials, Leadership, Risk Mitigation, Work Health and Safety, Building and Construction Procurement, Structural and Building Technology, Perspectives of Organisation, Engineering Research Methodology, Engineering Management, Research Project Part 1, Engineering Project and Operations Management, Research Project Part 2, Engineering Practice 1, Professional Practice 1, Civil Materials Practice, Construction Management Practice, Professional Practice 2, Work Experience – Professional, Structural Design I, Road Design and Location, Municipal	Introduction to Architectural Studies (CFU), Sustainable construction technology., High performance facades. Mechanical services, Indoor Environmental Quality. (IEQ), Building energy analysis, Building economics, Building Information Management, Intelligent building control. Asset and facility management (EL), Sustainable building design principles (EL), Sustainable building practice (EL), Architectural and audio acoustics (EL), Lighting technologies (EL), Architectural acoustics practice (EL), Energy management and code compliance (EL), Project Management (EL), Daylight in buildings (EL), Graduate Internship (EL), Research in Arch (EL) and Design Science, Dissertation 1 (EL), Dissertation 2 (EL),
Advance your knowledge and technical skills to deliver energy efficient and sustainable buildings through a comprehensive understanding of the context, principles and practice of environmentally sustainable design. A widening skills gap across industry means the demand for skilled professionals in energy efficient and sustainable building practices is on the rise. Your studies will prepare you to navigate the complex and rapidly changing environment of industry issues, trends, and economic and sustainability policies. You will get hands-on experience in sustainability assessment tools and software used in the design and planning process.	Study 4 core subjects in architecture design, methods, and technology—and get entry and credit in Curtin's Bachelor Degree. Explore connections between architecture and everyday life. Be introduced to international standards and indigenous perspectives	Enter an industry where initiative, creativity and critical awareness are valued. Explore how architecture relates to culture and daily life. Study building design and construction and express architectural ideas via reports, models and multimedia. This degree is the prerequisite for entry into the Master of Architecture. The degree covers the design of buildings, the technical aspects of building construction, and how architecture relates to societies, cultures and people and the way they live. Architectural ideas are communicated through written and spoken reports, photographs, drawings, models and the electronic media. Students not intending to continue on to the Master may use the knowledge gained in this degree to seek employment within the architectural profession or building industry	Become a project manager, quantity or building surveyor, estimator or contract administrator. Study domestic, commercial and civil construction technology, measurement and estimating, project management, and contract and cost management	Assemble your construction career. Cover design, drawings and lifecycles – making use of knowledge in construction planning, technology and science. With a focus on real-world learning, you'll learn to work with designs, read drawings, use industry-standard technology, navigate plans, and gain a holistic understanding of the entire project lifecycle as well as the roles and responsibilities of all stakeholders. You'll explore diverse areas such as construction technology, construction science, building services, contract administration, construction health and safety, building surveying and construction economics As a graduate, you'll come out with project management skills with the ability to plan and schedule construction operations using flowcharts, network analysis, Gantt charts, Critical Path Method	Construction management graduates work in a whole range of leadership roles in the construction industry including construction project management, contract management, quantity surveying, estimating, building surveying, building certification, facilities management, property development and WHS. They lead and coordinate physical building and infrastructure projects and can be site or office based. Construction managers have the need for a diverse range of skills to successfully manage the delivery of complex construction projects. Rewards for successful construction managers are considerable as the industry is experiencing a chronic skills shortage.	Developed with industry, this course is designed to prepare you for roles such as site supervisor, contract administrator, project management associate and estimating associate.	The Bachelor of Construction (Honours) gives you skills to apply your expertise of engineering solutions to construction problems and work in some of the world's most influential industries. UniSQ offers industry-based practical experience that allows you to put your study into practice. You will develop proficiency in problem-solving analysis, engineering design and construction project and business management, as well as expertise in built environment, quantity surveying and building services design.	By bringing together the myriad streams of building economics, indoor environmental quality, and environmental performance, this program produces built environment professionals with a strategic grasp of the challenges of building design, service provision, and operations.
https://www.rmit.edu.au/study-with-us/levels-of-study/postgraduate-study/masters-by-coursework/master-of-energy-efficient-and-sustainable-building-mc209	https://www.open.edu.au/degrees/undergraduate-certificate-in-architecture-curtin-university-cur-har-ctf	UNDERGRADUATE CUR-BAS-DEG-2024 (open.edu.au)	https://www.open.edu.au/degrees/bachelor-of-applied-science-construction-management-curtin-university-cur-cme-deg	https://www.open.edu.au/degrees/bachelor-of-construction-management-honours-university-of-south-australia-usa-cmh-deg	https://www.open.edu.au/degrees/bachelor-of-construction-management-university-of-newcastle-uon-cmt-deg	Diploma of Construction Management Open Universities Australia	https://www.open.edu.au/degrees/bachelor-of-construction-honours-construction-management-university-of-southern-queensland-usq-chm-deg	Master of Architectural Science (High Performance Buildings) - Unit of study table - The University of Sydney

UTS* Online	UTS* Online	Bond University
Grad Cert in Sustainable Leadership Grad Cert in Sustainable Energy Technologies Grad Cert in Sustainable Practice	Masters in Sustainable Leadership (Online)	Master of Building Information Modelling and Integrated Project Delivery
Graduate Certificate Sydney, NSW On Line Full-Time 8 months 4 Subjects	Masters Sydney, NSW On Line Full-Time 2 years 27 Subjects (9CU + 18 ES)	Masters SD-93039 Brisbane, Queensland On Campus Full-Time 1 year (3 semesters) 12 Subjects Plus Capstone Project
\$15,850.00	\$47,550.00	\$50,040 Total Fee
		Domestic International Capstone Project can be taken as Work Placement BuildingSMART Australasia
Shaping Policies for the Future (CU), Sustainable Practices in Industry (CU), Science of Climate Change for Leaders (CU), Science and Big Data (CU), Clean Energy Technology (CU), Sustainable Energy: Sources and Systems (CU), Innovation in Energy (CU), Science of Climate Change for Leaders (CU), Sustainable Energy: Sources and Systems (CU), Sustainable Practices in Industry (CU),	Shaping Policies for the Future (CU), Science of Climate Change for Leaders (CU), Sustainability Practices in Industry (CU), Science and Big Data (CU), Innovations in Energy (CU), Leading People and Change (CU), High Performance Science Leadership (CU), Communicating Science and Vision (CU), Leadership in Action (CU), Sustainable Energy: Sources and Systems (ES), Finance Fundamentals (6 CP) Data-Driven Decision Making (ES), Leading Organisational Change (ES), Planning & Design Theory and Decision-Making (ES), Delivering Customer Value (ES), Applied Financial Management (ES), Introduction to Psychological Science (ES), Technology and Innovation Management (ES), Digital Strategy: Aligning Business and Technology (ES),	Foundations of Intelligent Construction (OpenBIM) , Intellectual Property Rights (Data Exchange), (Modelling for Data and Visualisation) 4D-BIM (Schedule Optimisation), 5D-BIM (Cost Modelling), BIM for Environment Sustainability Assessment, BIM for Asset and Facilities Management,, BIM and BIG DATA (Geographical Information Systems (GIS)) , Process Evaluation and Change Management in BIM , Continuous Process Improvement (Quality and Safety Standards), Productivity and Off-site Fabrication (Minimising Waste), Managing Complexity in Construction (Maximising Value), BIM/IPD Capstone (Project), BIM/IPD Capstone (Work Placement)
Our journey towards a sustainable tomorrow is gaining momentum. We have science, data, technology and consumer demand. Now, more than ever, we need visionary leaders who can guide us there; strategic trailblazers who can inspire and motivate others to join in the quest for sustainable transformation and empower others to act through policy and best practice. Develop your leadership skills to drive change towards a sustainable future with the UTS Online Graduate Certificate in Sustainable Leadership, and not only future-proof your career but also contribute to the planet's well-being	Designed for professionals wanting to evolve their contemporary sustainability knowledge and build leadership skills to make informed decisions and empower teams to drive sustainable change.	Building Information Modelling (BIM) and Integrated Project Delivery represent the future of the construction industry. Developed in response to the challenge of lost productivity, budget blow-outs, time over-runs and waste that plagued major construction projects, IPD is a way of managing projects so that every member of the building team – owner, architect, contractors, engineers, fabricators, and subcontractors – work collaboratively throughout the construction process. Bond's Master of Building Information Modelling and Integrated Project Delivery is a cutting-edge program which has been designed in close collaboration with industry to prepare graduates for leadership roles in consultancies, client organisations and contracting organisations
https://studyonline.uts.edu.au/ppc/graduate-certificate-sustainable-leadership	https://studyonline.uts.edu.au/ppc/master-sustainable-energy?utm_campaign=Search-Sustainability-Online-PM&utm_source=Google&utm_medium=soc&utm_term=online%20master%20sustainable	Master of Building Information Modelling and Integrated Project Delivery Gold Coast (bond.edu.au)

ATTACHMENT 3: MADA STUDIO BOOKLET

The studio booklet has been published separately: https://building4pointzero.org/wp-content/uploads/2026/10/Project-66_Attachment-3_Final.pdf



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www.building4pointzero.org



[/building-4-0-crc](https://www.linkedin.com/company/building-4-0-crc)