



CIVL8204

Sustainable Construction Materials

Session 2, In person-scheduled-weekday, North Ryde 2026

School of Engineering

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Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

General Information

Unit convenor and teaching staff

Unit Convenor & Lecturer

Tohid Ghanbari-Ghazijahani

tohid.ghanbari@mq.edu.au

Contact via email

9WW

To be confirmed by email.

Credit points

10

Prerequisites

30 CP at 6000 level or above

Corequisites

Co-badged status

Unit description

You will explore the intersection of construction and environmental sustainability, focusing on how to select, use, and innovate construction materials that minimise environmental impact and enhance long-term resilience. In an era prioritising sustainable practices, you will gain expertise in sustainable construction materials and their application across the sector. You will learn strategies for improving energy efficiency, using eco-friendly materials, and adopting green construction methods to reduce waste and minimise the ecological footprint. Key topics include evaluating eco-friendly materials, sustainable sourcing, and incorporating renewable resources into construction projects. Through classroom learning and real-world case studies, you will understand how sustainable materials can transform the built environment and contribute to a more resilient future.

Learning in this unit enhances your understanding of global challenges identified by the United Nations Sustainable Development Goals (UNSDGs): Industry, Innovation and Infrastructure; Sustainable Cities and Communities; and Responsible Consumption and Production.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

ULO1: Analyse characteristics of conventional and emerging construction materials under varying environmental conditions.

ULO2: Evaluate material selection decisions using life-cycle thinking, environmental impact assessment tools, and relevant Australian and international sustainability frameworks.

ULO3: Evaluate material deterioration and degradation to inform durability design and long-term performance strategies.

ULO4: Develop innovative and sustainable material solutions for civil engineering applications that balance performance, durability, and regulatory compliance.

ULO5: Critique current materials selection practices and propose innovative, economically viable approaches that minimise environmental impacts while enhancing construction performance and circularity.

General Assessment Information

See details of the assessments on the iLearn page.

Any request for a late submission must be supported by an approved Special Consideration application with sufficient supporting evidence and will be assessed in accordance with Macquarie University's policies.

Grading and passing requirements for the unit

To pass this unit, a student must obtain a mark of 50 or more for the unit (i.e., get a passing grade P/ CR/ D/ HD).

For more details about grading, please refer to the policies and procedures section.

Late submissions

Assignments must be undertaken/submitted at the time indicated in the unit guide. Should these activities be missed due to illness or misadventure, students may apply for Special Consideration.

Late assessments are not accepted in this unit unless a [Special Consideration](#) has been submitted and approved.

Special Consideration

The [Special Consideration Policy](#) aims to support students who have been impacted by short-term circumstances or events that are serious, unavoidable, and significantly disruptive, and which may affect their performance in assessment. If you experience circumstances or events that affect your ability to complete the written assessments in this unit on time, please inform the convenor and submit a Special Consideration request through ask.mq.edu.au.

Assessment Tasks

Name	Weighting	Hurdle	Due	Groupwork/Individual	Short Extension	AI Approach
<u>Project Report</u>	30%	No	16/10/2026	Group	No	Open
<u>Final Exam</u>	40%	No	TBA	Individual	No	Observed
<u>Presentation</u>	30%	No	30/10/2026	Individual	No	Observed

Project Report

Assessment Type ¹: Problem-based task

Indicative Time on Task ²: 40 hours

Due: **16/10/2026**

Weighting: **30%**

Groupwork/Individual: Group

Short extension ³: No

AI Approach: Open

You will Investigate different construction materials and their suitability in regard to sustainability and environmental impacts.

On successful completion you will be able to:

- Analyse characteristics of conventional and emerging construction materials under varying environmental conditions.
- Evaluate material selection decisions using life-cycle thinking, environmental impact assessment tools, and relevant Australian and international sustainability frameworks.
- Evaluate material deterioration and degradation to inform durability design and long-term performance strategies.
- Develop innovative and sustainable material solutions for civil engineering applications that balance performance, durability, and regulatory compliance.
- Critique current materials selection practices and propose innovative, economically viable approaches that minimise environmental impacts while enhancing construction performance and circularity.

Final Exam

Assessment Type ¹: Examination

Indicative Time on Task ²: 20 hours

Due: **TBA**

Weighting: **40%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

You will undertake a final examination during the formal examination period.

On successful completion you will be able to:

- Evaluate material selection decisions using life-cycle thinking, environmental impact assessment tools, and relevant Australian and international sustainability frameworks.
- Evaluate material deterioration and degradation to inform durability design and long-term performance strategies.
- Develop innovative and sustainable material solutions for civil engineering applications that balance performance, durability, and regulatory compliance.
- Critique current materials selection practices and propose innovative, economically viable approaches that minimise environmental impacts while enhancing construction performance and circularity.

Presentation

Assessment Type ¹: Presentation task

Indicative Time on Task ²: 20 hours

Due: **30/10/2026**

Weighting: **30%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

You will present a topic on Sustainability relating to building materials and construction.

On successful completion you will be able to:

- Analyse characteristics of conventional and emerging construction materials under varying environmental conditions.
- Evaluate material deterioration and degradation to inform durability design and long-term performance strategies.
- Develop innovative and sustainable material solutions for civil engineering applications that balance performance, durability, and regulatory compliance.
- Critique current materials selection practices and propose innovative, economically viable approaches that minimise environmental impacts while enhancing construction performance and circularity.

¹ If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- [Academic Success](#) for academic skills support.

² Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation.

³ An automatic short extension is available for some assessments. Apply through the [Service Connect Portal](#).

Delivery and Resources

Delivery: Seminar plus Workshop sessions weekly.

Methods of Communication: Communication for this unit will be conducted through your Macquarie University email account and announcements posted on iLearn. If you have any questions, please contact the unit convenor directly via the email address provided on the iLearn site.

Resources: the lecture notes and material uploaded to the iLearn page.

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](https://policies.mq.edu.au) (<https://policies.mq.edu.au>). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Assessment Procedure](#)
- [Complaints Resolution Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

Students seeking more policy resources can visit [Student Policies](https://students.mq.edu.au/support/study/policies) (<https://students.mq.edu.au/support/study/policies>). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit [Policy Central](https://policies.mq.edu.au) (<https://policies.mq.edu.au>) and use the [search tool](#).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit connect.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Academic Success

[Academic Success](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Ask a Study Coach](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

Student Services and Support

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)

- [Student Advocacy](#) provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via the [Service Connect Portal](#), or contact [Service Connect](#).

IT Help

For help with University computer systems and technology, visit <https://students.mq.edu.au/support/technology/service-desk>.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

Changes from Previous Offering

The Unit Convenor & Lecturer was changed in 2026. Make sure you refer to the updated information in 2026.

Engineers Australia Competencies Mapping

EA Competency Standard	Competency Element	Unit Learning Outcomes
Knowledge and Skill Base	1.1 Comprehensive, theory-based understanding of the underpinning fundamentals applicable to the engineering discipline.	ULO1, ULO3
	1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing.	ULO1, ULO2, ULO3
	1.3 In-depth understanding of specialist bodies of knowledge.	ULO1, ULO2, ULO3
	1.4 Discernment of knowledge development and research directions.	ULO4, ULO5
	1.5 Knowledge of engineering design practice.	ULO2, ULO3, ULO4
	1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice.	ULO2, ULO4, ULO5
Engineering Application Ability	2.1 Application of established engineering methods to complex problem solving.	ULO1, ULO2, ULO3, ULO4
	2.2 Fluent application of engineering techniques, tools and resources.	ULO1, ULO2, ULO3
	2.3 Application of systematic engineering synthesis and design processes.	ULO2, ULO3, ULO4, ULO5
	2.4 Application of systematic approaches to the conduct and management of engineering projects.	ULO4
Professional and Personal Attributes	3.1 Ethical conduct and professional accountability.	ULO2, ULO4, ULO5
	3.2 Effective oral and written communication in professional and lay domains.	ULO4, ULO5

EA Competency Standard	Competency Element	Unit Learning Outcomes
	3.3 Creative, innovative and pro-active demeanour.	ULO4, ULO5
	3.4 Professional use and management of information.	ULO1, ULO2, ULO3, ULO5
	3.5 Orderly management of self, and professional conduct.	
	3.6 Effective team membership and team leadership.	

Unit information based on version 2026.03 of the [Handbook](#)