

VCE Visual Communication Design Units 1 & 2

Chapter 6 — Design, place and time

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Chapter 6 Design, place and time — 6A The design process for environmental projects

Theory

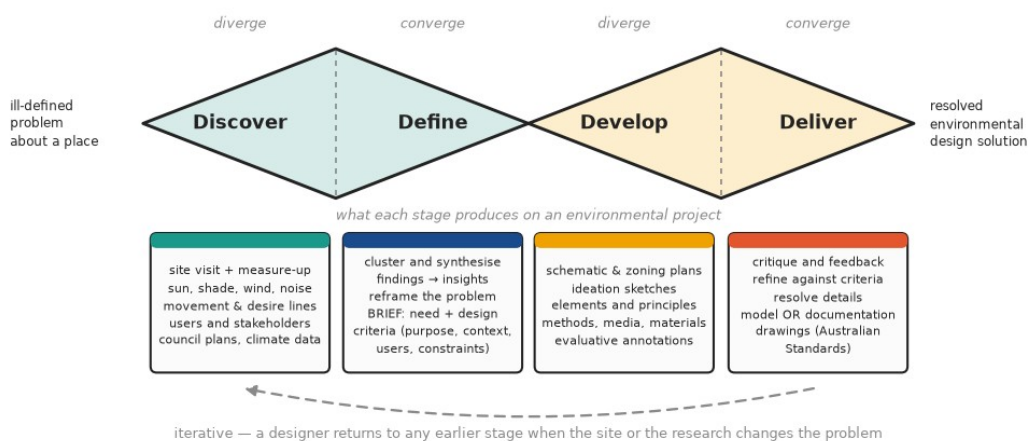
An **environmental design problem** is a problem about a **place**. Environmental designers design the spaces in which people live, work and play: the specialists who do this work include **architects, landscape architects, interior designers, exhibition and set designers** and urban designers. In this Area of Study you adopt their practices and apply the **whole** VCD design process — all four stages — to a location you have chosen.

Designing a place is not the same as designing a poster, and the difference changes how you research and how you work.

- A place is **fixed**. It has one orientation, one set of boundaries, one soil, one slope, one set of neighbours. You cannot move a courtyard away from the wall that shades it.
- A place is experienced **in time**. Users move *through* it rather than look *at* it, and it changes across the day, the week and the seasons — light, shade, temperature, noise, crowds.
- A place is **three-dimensional and inhabited**. Its users include people who never chose to be there: passers-by, neighbours, delivery drivers, wildlife.
- A place is **regulated, expensive and long-lived**. Planning controls, heritage overlays and Australian Standards for access apply, and the result may stand for fifty years.

Watch-out — “environmental design” does not mean “eco design”. In this study *environmental design* means **designing environments (spaces)**. It is not a synonym for sustainable design, and it is not the same as the **environmental factor** — one of the five factors that impact design projects (Chapter 6C). A brief for an environmental project may say nothing about sustainability, and a sustainable object (Chapter 5) is not an environmental design.

The VCD design process. You apply an **iterative** design process with four stages — **Discover, Define, Develop, Deliver** — based on the Double Diamond model developed by the Design Council (UK). Each diamond widens (**divergent thinking**: open, curious, judgement suspended) and then narrows (**convergent thinking**: analytical, comparative, synthesising).

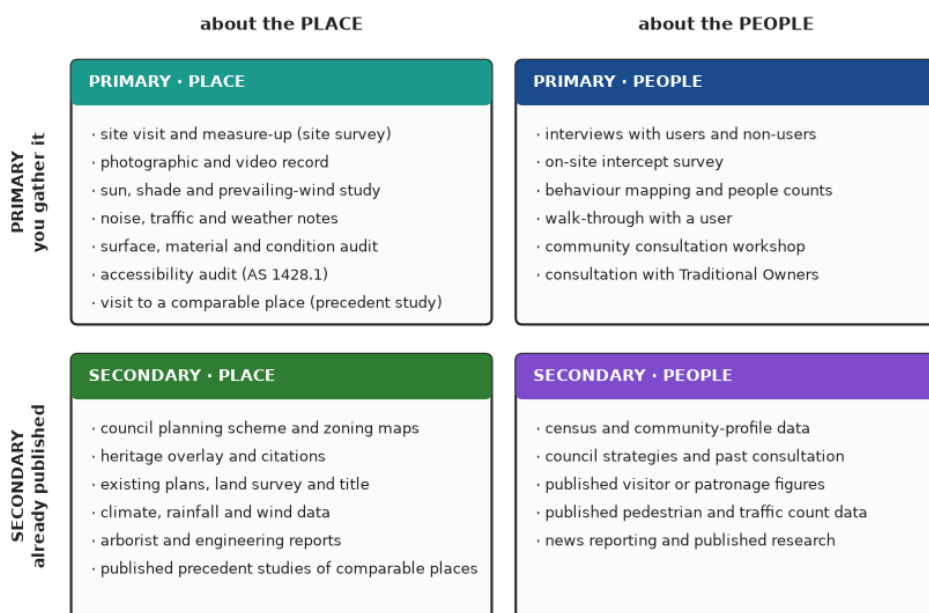


Stage	Thinking	Its role on an environmental project
Discover	divergent	Find out what is actually happening in this place, for these people. Research the site itself <i>and</i> the people who use it, so the problem you design for is the real one rather than the one the client assumed.

Stage	Thinking	Its role on an environmental project
Define	convergent	Make sense of the research, reframe the problem, and write the brief — the client and the communication need , and the design criteria the solution will be judged against: the purpose, the context, the audience or users, and a list of design constraints .
Develop	divergent	Generate many spatial ideas that respond to the brief and to the place, drawing inspiration from contemporary sources and historical styles and traditions, and evaluate them in annotations.
Deliver	convergent	Critique, take feedback, select and refine the concepts with the most potential against the criteria, resolve the details, and present the solution as a model or as documentation drawings with technical conventions that comply with Australian Standards.

The stages are **not** a one-way line. A measure-up that discovers a tree's protection zone, or a heritage overlay found halfway through Develop, sends the designer back to change a constraint in the brief. This return is normal practice, not failure.

Discover — research the place and the people. Environmental research has two halves, and a project that does only one of them fails.



triangulate: at least one method that hears people, one that watches behaviour, and one that measures the place

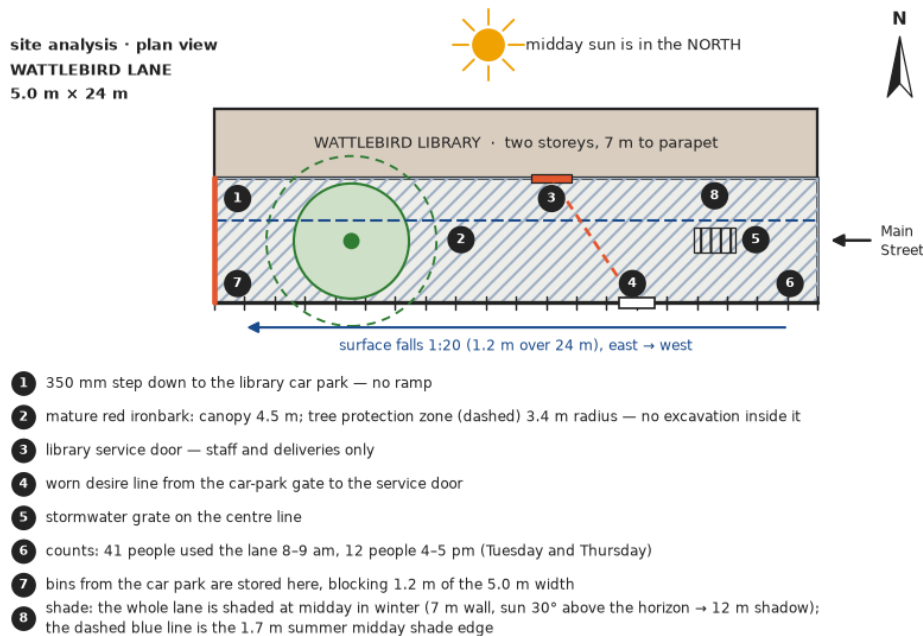
Primary research is data *you* gather first-hand — a measure-up, a count, an interview. **Secondary** research is data *someone else* has gathered and published — a planning scheme, a climate record, a heritage citation. **Primary research about the place cannot be skipped:** a site photographed from above tells you nothing about the smell of the drain, the 350 mm step at the gate, or the fact that the whole lane is in shade by 3 pm in July.

Because every method is partial, designers **triangulate**: at least one method that *hears* people, at least one that *watches* what they do, and at least one that *measures* the place. What people say and what people do often disagree, and in environmental work the disagreement is usually visible on the ground — a worn track across a lawn is physical evidence of a route the plan never provided.

Research method	What you do	What it can reveal about the problem
Site visit and measure-up (site survey)	Walk the site; measure boundaries, widths, levels and thresholds; record surfaces, structures, services and condition; take dated photographs from fixed positions	The real dimensions and condition you must design within — the base information every later drawing depends on
Sun, shade and wind study	Establish the orientation, then record where sun and shade fall at different times of day and in different seasons; note the prevailing wind	Whether the space can be used <i>when</i> people want to use it — a leading cause of unused outdoor space
Behaviour mapping and people counts	Observe from a fixed position for a set period; record where people walk, stop, sit, queue and avoid, and how many	What people actually do : desire lines, pinch points, dead corners, peak times
Interviews with users and non-users	Short, open questions with people who use the place — and with people who avoid it	Motives, feelings and barriers; the <i>reason</i> behind an observed behaviour
On-site intercept survey	A short, fixed set of questions asked of many people on site	Patterns across a larger group, in numbers you can compare
Community consultation workshop	A facilitated session in which stakeholders mark problems and priorities on a plan of the site	Competing interests, and issues no individual user would have raised
Accessibility audit	Travel the route as a person using a wheelchair, a pram, a cane or a hearing aid would; measure gradients, widths, thresholds, handrails, tactile indicators, lighting and acoustics	Exclusions that stop use altogether, and obligations under Australian Standards such as AS 1428.1
Precedent study of comparable places	Visit or study environments that answer a similar problem; record what works, what fails and why. Visiting one yourself makes it primary research about a place; working from published plans, photographs or reviews makes it secondary	A benchmark for judging your own ideas — a source of understanding, never a design to copy
Council and planning research	Read the planning scheme and zoning, heritage overlays, existing plans, title, and arborist or engineering reports	Legal and physical constraints that decide whether an idea is even possible
Climate and demographic data	Retrieve rainfall, temperature and wind records, and census or community-profile data	Long-run conditions, and who the community actually is — beyond whoever happened to be there on the day
Cultural research and consultation	Research the Country the site sits on; where cultural knowledge or representation is involved, consult Traditional Owners and follow the	Meanings and obligations that belong to the place (see Chapter 8)

Time-sampling. One visit is one moment. A site must be recorded at **more than one time** — a weekday and a weekend, morning and late afternoon, fine weather and wet — because the problem often only appears at 3.30 pm on a Thursday. A single Sunday-morning visit in the rain is not a study of a place; it is a snapshot of a place in the rain.

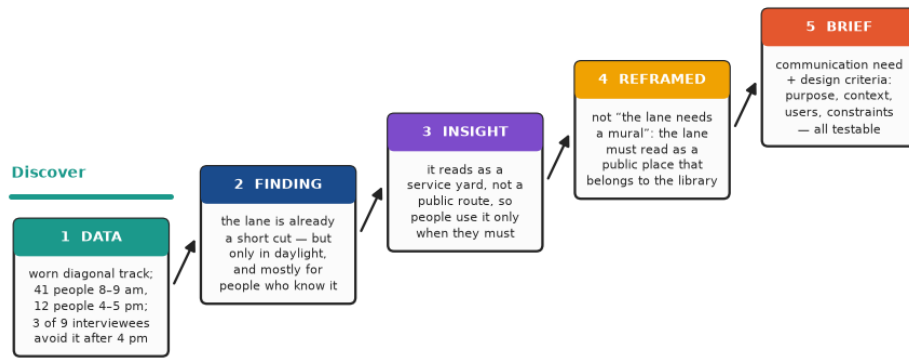
Site analysis. The findings of place-based research are usually drawn up as a **site analysis**: a plan of the site annotated with what you measured and observed.



*The site: **WATTLEBIRD LANE**, a 5.0 m × 24 m gravel lane between the rear wall of a regional library and the fence of its car park. The council wants the lane to become a small outdoor reading courtyard.*

A site analysis becomes research only when each observation carries an **implication** — a “so what” for the design. “The library is two storeys” is a description. “The two-storey wall on the lane’s north boundary puts the whole lane in shade at midday in winter — a 7 m wall casts a 12 m shadow when the winter sun is only 30° above the horizon, and the lane is only 5 m wide — **so** the courtyard cannot rely on winter sunlight at all; it must instead be sheltered from wind, use pale paving and wall finishes to lift the light level, and be lit artificially, while the seating that is meant to catch sun in the warmer months belongs on the **southern** side, against the fence and furthest from the shading wall” is research. (At midday in summer the same wall casts a shadow of only about 1.7 m, so the southern two-thirds of the lane is in sun.) Remember that in Australia the midday sun is in the **north**, so a building on the north boundary shades the space to its south, and the strip furthest from that building is the first to come into sun.

Define — from data to a brief. In Define you switch to convergent thinking and climb a ladder.



each rung asks a different question: what did we record? · what does it say? · why is it happening? · what is the real problem? · how will we judge a solution?

- **Data** is what you recorded — counts, measurements, photographs, transcripts.
- A **finding** is what the data *says*, stated plainly with its evidence attached.
- An **insight** is *why* it happens — the interpretation a designer can act on.
- The **reframed problem** is the real problem, which is often not the one the client named.
- The **brief** identifies the client and the **communication need**, and sets out the **design criteria**: the purpose, the context, the audience or users, and a list of design constraints.

Two distinctions decide whether a brief is usable.

- A **design constraint** is a kind of design criterion, not a rival list. The **design criteria** are the whole set of statements the success of a design idea is evaluated against, and the study writes them as the purpose, the context, the audience or users **and** a list of **design constraints**. What you must get right is which *kind* of criterion a statement is. A **design constraint** comes from the situation and is a real limit the designer cannot change (the lane is 5.0 m wide; the tree protection zone forbids excavation; the budget is \$60 000; works can only happen in the January shutdown). The remaining criteria come from the need and state what the solution must achieve (“provides seating for at least eight people that is usable in winter”). Either kind must be **testable** against the resolved solution: “looks good” is not a criterion, and a “constraint” that only says the need again (“must feel welcoming”) is not a constraint.
- A **communication need** is not a design solution. “Build a pergola” is a solution. “People passing on Main Street need to recognise, from the footpath, that the lane is a public place belonging to the library and is safe to enter” is a need — and it can be met by a gateway, a surface treatment, planting, lighting, seating or a sign.

Develop — generate spatial ideas. Develop opens out again. You brainstorm with words and images, draw inspiration from contemporary sources and from historical design movements and traditions (Chapter 6B), and generate many ideas rapidly rather than polishing one. For environments the typical Develop methods are **schematic and zoning diagrams** (where the quiet zone, the through route and the planting go, before anything is drawn accurately), **ideation sketches**, and quick **paraline and perspective views** to test how a space would feel from eye level; you also experiment with the **design elements and principles** and with combinations of methods, media and materials. The drawing methods themselves are the subject of Chapter 7.

Annotations carry the thinking. An annotation that only labels (“timber bench”) is a caption. An evaluative annotation states the decision, the reason and the judgement: “bench set against the south fence, the only strip that comes into sun at midday; timber slats respond to the library’s existing screen — but it narrows the through route to 2.4 m, which may block the desire line.”

Deliver — resolve and present. Deliver returns to convergent thinking. You present concepts for **critique**, take **feedback**, and use the **design criteria** from the brief — not personal preference — to select the concept with the most potential. You then refine it, resolve the details and materials, and present the resolved solution in a format suited to an environment: a **model**, or **documentation drawings** (plans, elevations, sections) with technical conventions that comply with **Australian Standards**, often supported by a rendered perspective. Finally you evaluate the extent to which the solution meets the brief.

Note the study’s vocabulary here: design **ideas** are the many rapid, experimental options of Develop; design **concepts** are the few selected ideas developed far enough to be tested and critiqued; the design **solution** is the single resolved outcome that is presented.

Units 3 & 4 preview — beyond the Units 1&2 study design. In Units 3 and 4 the Deliver phase adds two methods you are **not** required to use here. First, the designer resolves **two distinct design concepts for two different communication needs** from a single brief, keeping them distinct in purpose *and* presentation format, and carries both through to two final presentations. Second, the designer devises and delivers a **pitch** — a prepared presentation that justifies the choice of methods, media, materials, design elements and principles and presentation format to an audience or users — then considers the responses to the pitch and further refines each selected concept. Unit 3 also formalises the earlier critique of design *ideas*: there, feedback is delivered and responded to in **written reflective and critical evaluations**. In Units 1 and 2 you present concepts for **critique** and respond to feedback, which is a simpler task: no pitch, no written critical evaluation, and **one** communication need. These methods are previewed only so that the habit of justifying decisions against criteria is already in place; they are **not assessed** in any question in this subtopic.

Watch-out — use the study’s stage names. Discover, Define, Develop, Deliver — not “research, plan, draw, finish”. Name the stage the question is about, and remember the process is **iterative**.

Watch-out — a site analysis is not a site description. Every observation needs its design implication. Markers on a plan earn nothing until you say what they mean for the design.

Watch-out — you cannot Discover a place from a screen. Satellite images, street-view and council PDFs are **secondary** research. They cannot give you levels, thresholds, noise, smell, glare or the way people actually move. Primary on-site research is compulsory in environmental work.

Watch-out — one visit is not a study. Record the site at more than one time of day, on more than one day, and note the weather. State when you were there.

Watch-out — do not over-claim your data. Report what you counted, when you counted it and in what weather: “11 of the 15 people interviewed”, not “most people”. A small sample gives direction, not proof, and “nobody uses it” is never a finding.

Watch-out — a stakeholder is not always a user. A committee member, a council officer or a client speaks for an interest, not for the people who use the space. Research both.

Watch-out — do not set “the constraints” against “the criteria”. The design constraints are one of the four things a brief’s design criteria consist of, so a brief has **one** list of criteria, not two. The real error is the other one: writing a “constraint” that is only the need said again (“must be welcoming”) instead of a limit you could check against a drawing.

Watch-out — precedent research is not permission to copy. Study comparable places to understand what works; the design you produce must be your own (Chapter 2B).

Worked examples

Example 1 — scaffolded

*The WATTLEBIRD LANE committee says the lane “just needs brightening up with a mural”. Describe the **Discover** stage of the VCD design process and explain how **two** research methods would be used to identify the real environmental design problem in this lane. (5 marks)*

Working	Comment
Discover is the first stage of the VCD design process. In it the designer gathers insights into an ill-defined problem, researching both the place and the people who use it, and thinks divergently — searching widely and suspending judgement about what the answer might be.	“Describe the stage” means give its features: where it sits, what happens in it, and which mode of thinking. For an environmental project, say that the research has two halves — that is the markable detail.
Method 1 — site visit and measure-up. The team measures the lane (5.0 m × 24 m), records the 1:20 fall from east to west, the 350 mm step at the western end, the tree protection zone, and the position of the	Name the method and say what is recorded . A method with no data attached is not an answer. Naming the return visits shows you know a site changes in time.

Working	Comment
stormwater grate, and returns at three different times to record sun and shade.	
This produces the base facts: the lane is in shade at midday all winter and the western entry is not accessible, ∴ a mural would not change whether the lane can be used.	Explain what the method yields , then draw the implication. This is where the analysis marks sit.
Method 2 — behaviour mapping with counts. From a fixed point the team records where people walk, stop and turn back, and counts them: 41 people used the lane between 8 and 9 am and 12 between 4 and 5 pm, and a worn diagonal track shows a route from the car-park gate to the service door.	A second method that is genuinely different in kind — this one watches what people do , so it can contradict what the committee says.
∴ Discover reframes the committee’s assumption: the lane is already a route people use, but only in daylight and only as a short cut, so the problem is how the lane reads and functions as a public place , not how it is decorated.	Close by showing the stage doing its job — overturning the client’s framing with evidence.

Example 2 — scaffolded

*Explain how the WATTLEBIRD LANE team would use the **Define** stage to turn its research into a brief, and state one **design constraint** and one other **design criterion** that would appear in it. (5 marks)*

Working	Comment
In Define the team switches to convergent thinking : it clusters and categorises everything Discover produced, and summarises it so the material makes sense.	Name the mode of thinking first — Define is the convergent half of the first diamond.
The clusters produce a finding : the lane is already a short cut, but it is used in daylight and mostly by people who already know it. Asking <i>why</i> turns the finding into an insight : the lane reads as a service yard rather than a public route, so people use it only when they must.	Show the ladder: data → finding → insight. The insight must explain <i>why</i> , not restate the count.
That insight reframes the problem the council brought (“it needs a mural”) and yields a communication need : people passing on Main Street need to recognise, from the footpath, that the lane is a public place belonging to the library and is safe to enter.	The reframe and the need are the whole point of Define. Note the need names no artefact.
Design constraint : no excavation is permitted inside the red ironbark’s 3.4 m tree protection zone.	The design constraints are the criteria that come from the situation — limits the designer cannot change. They sit inside the criteria, not opposite them.
A further design criterion : the finished lane must be enterable from Main Street and from the car park without a step, and must provide seating for at least eight people that is usable in winter.	This one comes from the need and states what the solution must achieve. Either kind must be testable — you can check it against the resolved drawing. “Looks welcoming” would earn nothing.

Example 3 — unscaffolded

*Explain the role of the **Develop** stage in producing an environmental design solution for WATTLEBIRD LANE. (4 marks)*

The role of **Develop** is to open the problem out again after Define has narrowed it, and to generate many spatial possibilities that answer the brief. The team returns to **divergent thinking** and works rapidly and in quantity rather than polishing one option: **schematic and zoning diagrams** test where the through route, the seating and the planting could sit within the 5.0 m width; **ideation sketches** and quick eye-level views test how each arrangement would feel to someone entering from Main Street. Inspiration is sought widely — from contemporary laneway projects and from

historical styles and traditions — and each idea experiments with the **design elements and principles**, for example using pale surfaces and a strong linear rhythm to draw the eye down a shaded lane. Ideas are recorded with **evaluative annotations** that state the decision, its reason and its weakness, judged against the brief: “bench against the south fence, the only strip that comes into sun, but it narrows the through route to 2.4 m and may block the desire line.” ∴ Develop’s role is to produce a wide, well-documented range of options — and the evidence for choosing between them — so that Deliver has something worth converging on.

Example 4 — unscaffolded

*Discuss how the **Deliver** stage completes the VCD design process on an environmental project, referring to feedback, the design criteria and the resolution of the solution. (6 marks)*

Deliver is the second convergent half of the process: its job is to reduce many ideas to **one resolved solution** and to prove that it answers the brief. The stage begins with **critique**. The WATTLEBIRD team presents its strongest concepts to peers and to the library committee, who respond to the design rather than to the intention behind it; feedback that the entry “still looks like a back door” is more useful to the team than agreement, because it identifies a failure the designers had stopped being able to see. Feedback is then applied convergently against the **design criteria** set in the brief — step-free entry from both ends and seating for eight that is usable in winter, and, among the design constraints, no excavation inside the tree protection zone. Judging against criteria rather than preference is what makes the selection defensible: a concept the team likes but which puts its seating in the permanently shaded western half fails a criterion and is set aside, and the criteria also tell the team *what* to refine rather than merely that something is wrong.

The team then **resolves** the selected concept: it fixes dimensions, levels, materials and details, and presents the solution in a format an environmental design can actually be built from — a **model** of the lane, or **documentation drawings** (a plan, elevations and a section) carrying technical conventions that comply with **Australian Standards** — usually alongside a rendered perspective that shows the intended experience. Finally the team evaluates the extent to which the resolved solution meets the brief, and where the criteria are still not fully met the process **iterates** rather than stops. ∴ Deliver completes the process by converting a promising idea into a resolved, documented and tested solution, with the brief’s criteria as the measure at every step.

Practice questions

*Three environmental projects are referred to below: **WATTLEBIRD LANE**, described and analysed in the Theory section; the **SPINEBILL WETLAND RESERVE** research board shown before Question 7; and the **SILVEREYE ARTS CENTRE** foyer described here.*

SILVEREYE ARTS CENTRE is a regional arts centre built in 1974. Its foyer is 14 m × 9 m with a 2.7 m ceiling, a fully glazed east wall, a mezzanine stair, and carpet laid in 1998. Audiences arriving for evening performances bunch up inside the entry doors and queue out onto the footpath. The centre’s manager believes “the foyer is too small”. An interior design student team has been engaged to Discover and Define the problem. The building is on the council’s heritage register: the original terrazzo floor and the stair balustrade must be retained. The budget is \$85 000, works may only be carried out during the four-week January shutdown, and any new ramp must comply with AS 1428.1. The glazed east wall causes glare and heat between 8 am and 11 am.

Scaffolded

Q1. The VCD design process on an environmental project: (a) Name the four stages in order and state which mode of thinking dominates each. (2 marks) (b) State the stage in which each of these activities belongs: measuring a laneway and recording its levels; writing the design criteria; sketching four courtyard layouts; refining the chosen concept after a critique. (2 marks) (c) Explain what it means to say the process is **iterative**, using one environmental example. (2 marks)

Q2. Research methods for the WATTLEBIRD LANE project: (a) Distinguish between primary and secondary research, giving one environmental example of each. (2 marks) (b) Name two **primary** methods that investigate the *place* rather than the people, and state what each would yield. (2 marks) (c) Explain why the team should use both a method that hears what people **say** and a method that watches what people **do**. (2 marks)

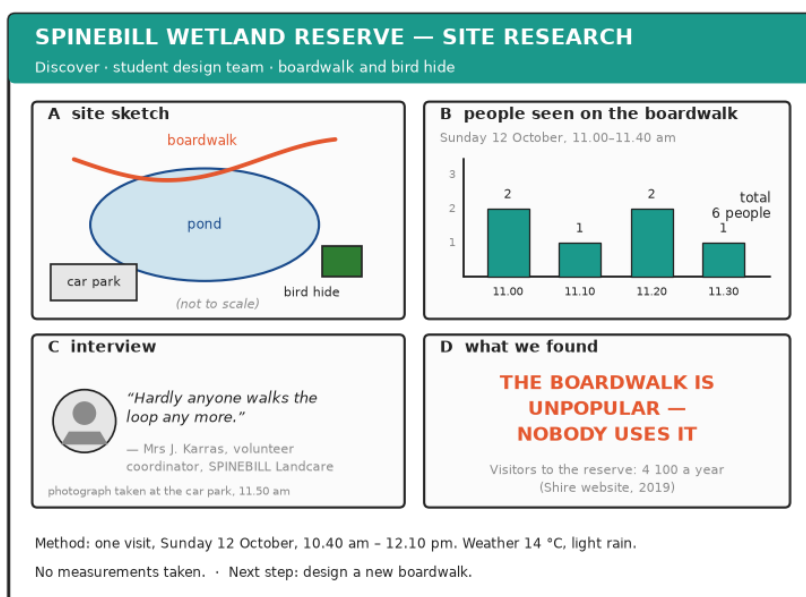
Q3. Using the WATTLEBIRD LANE site analysis: (a) Identify three conditions the team recorded on the site. (3 marks) (b) For **one** of them, state the design implication for a reading courtyard. (2 marks) (c) Explain why the team recorded the lane at more than one time of day and in more than one season. (2 marks)

Q4. The SILVEREYE ARTS CENTRE brief: (a) State the four things a brief's **design criteria** consist of, and distinguish a **design constraint** from a criterion that comes from the communication need. (2 marks) (b) Identify two **design constraints** in the SILVEREYE project and state the effect of each on the design. (2 marks) (c) Write one testable design criterion for the SILVEREYE foyer. (2 marks)

Q5. A SILVEREYE team records three pieces of data: (i) 12 of the 18 people interviewed said they “walked in and stopped, looking for someone to ask”; (ii) timed observation recorded an average pause of 22 seconds just inside the entry doors; (iii) the box-office sign is fixed 2.4 m up on a dark timber wall, behind the ticket queue and out of sight from the entry. (a) Distinguish between a **finding** and an **insight**. (2 marks) (b) Write one insight statement supported by this data. (2 marks) (c) Identify one further piece of research the team should carry out before accepting that insight. (1 mark)

Q6. Resolving and presenting an environmental design solution: (a) Name two formats in which a resolved environmental design solution may be presented. (2 marks) (b) Distinguish between a design **concept** and a design **solution**. (2 marks) (c) Explain why documentation drawings for an environmental project must follow technical conventions that comply with Australian Standards. (2 marks)

Unscaffolded



Questions 7–14 refer to the SPINEBILL WETLAND RESERVE research board shown above, produced by a student team at the end of their Discover stage. The reserve has a pond, a 400 m timber boardwalk loop, a bird hide and a gravel car park, and the shire has asked the team to improve the way visitors experience the wetland.

Q7. Identify the research method that produced each of panels A, B and C, and state whether each is primary or secondary. (3 marks)

Q8. Explain why this board does not yet identify an environmental design problem, referring to the stages of the VCD design process. (4 marks)

Q9. Explain why the claim in panel D is not supported by the evidence on the board, and rewrite it as a finding with its evidence attached. (3 marks)

Q10. Identify **two** kinds of information about the *place* that are missing from this board and that the team will need before Define, and recommend one research method for each. (4 marks)

Q11. Evaluate the effectiveness of this board as research that identifies an environmental design problem. (6 marks)

- Q12.** Using only the evidence on the board, write a communication need for the SPINEBILL WETLAND RESERVE and explain why a communication need is not a design solution. *(4 marks)*
- Q13.** Identify one ethical shortcoming in the way panel C presents the team’s research and describe how the team should have handled it. *(3 marks)*
- Q14.** Explain why a single visit on one Sunday morning is insufficient research for this site, and describe a time-sampling plan the team should follow instead. *(4 marks)*
- Q15.** (*WATTLEBIRD LANE.*) Using the site analysis, explain how **three** of the recorded conditions will constrain the design of a reading courtyard. *(6 marks)*
- Q16.** (*SILVEREYE ARTS CENTRE.*) Explain the role of the Develop stage in generating ideas for the foyer, referring to the team’s insight about the box office. *(4 marks)*
- Q17.** (*SILVEREYE ARTS CENTRE.*) Discuss how the team should use the Deliver stage to resolve and present its foyer solution, and justify the presentation format you would choose. *(6 marks)*
- Q18.** Compare the roles of divergent and convergent thinking across the four stages of the VCD design process on an environmental project. *(6 marks)*
- Q19.** Distinguish between **environmental design** and **sustainable design**, and explain why confusing the two would lead a student to misread a brief. *(3 marks)*
- Q20.** Explain why online mapping, street-level imagery and published council documents cannot replace on-site primary research when identifying an environmental design problem. *(3 marks)*
- Q21.** Explain the difference between using a **precedent study** in Discover and copying an existing design, referring to the designer’s obligations. *(3 marks)*
- Q22.** Choose **one** of the three projects in this subtopic. Outline how you would apply all four stages of the VCD design process to it, naming two research methods you would use, one design criterion you would set, and the format in which you would present the resolved solution. *(6 marks)*

Answers

Q1. (a) Discover (divergent), Define (convergent), Develop (divergent), Deliver (convergent). (b) Discover; Define; Develop; Deliver. (c) See solutions. **Q2.** (a) Primary = gathered first-hand by you (a measure-up); secondary = already published by others (a heritage overlay). (b) e.g. site visit and measure-up; sun-and-shade study. (c) Say-methods give reasons, do-methods give behaviour; used together they triangulate. See solutions. **Q3.** (a) Any three of: 5.0 m × 24 m; 350 mm step, no ramp; tree protection zone 3.4 m; whole lane shaded at midday in winter; 1:20 fall east to west; stormwater grate on the centre line; worn desire line; 41 people 8–9 am and 12 people 4–5 pm; bins blocking 1.2 m. (b) & (c) See solutions. **Q4.** (a) Purpose; context; audience or users; design constraints. A design constraint is a limit set by the situation; the other criteria state what the need requires the solution to achieve. (b) e.g. heritage listing of the terrazzo floor and balustrade; the four-week January work window; the \$85 000 budget; AS 1428.1. (c) Model criterion in solutions. **Q5.** (a) Finding = what the data says; insight = why it happens. (b) Model insight in solutions. (c) e.g. observe arrivals at a second, busier performance, or interview front-of-house staff. **Q6.** (a) A model; documentation drawings (plan, elevations, section) — accept a rendered perspective or concept board as a supporting format. (b) Concept = a selected idea developed for testing and critique; solution = the single resolved outcome presented. (c) See solutions. **Q7.** A = site sketch from a site visit (primary); B = observation/people count (primary); C = interview (primary). The visitor figure in panel D is secondary. **Q8.** It records data but produces no finding, insight or reframed problem, so Define has not happened — and it jumps to a solution (“design a new boardwalk”). See solutions. **Q9.** Six people in 40 minutes on one wet Sunday morning cannot support “nobody uses it”. See solutions. **Q10.** Any two of: measurements/levels of the boardwalk and car park; accessibility of the route; orientation, shade and wind; planning, heritage or environmental overlays; condition of the timber. Methods in solutions. **Q11–Q22.** See fully-worked solutions.

Fully-worked solutions

Q1. (a) **Discover** (dominated by **divergent** thinking), **Define** (**convergent**), **Develop** (**divergent**), **Deliver** (**convergent**) (2 marks: *order + modes*). (b) Measuring a laneway and recording its levels — **Discover**; writing the design criteria — **Define**; sketching four courtyard layouts — **Develop**; refining the chosen concept after a critique — **Deliver**. (c) **Iterative** means the designer passes through and *revisits* the stages rather than moving through them once. For example, if a measure-up during Develop shows that the red ironbark’s tree protection zone extends 3.4 m into the WATTLEBIRD courtyard, the team returns to **Define** to add that constraint and revise the criteria before continuing to generate ideas (2 marks: *revisiting explained + a specific environmental example*).

Q2. (a) **Primary** research is data the designer gathers first-hand for this project — for example measuring the lane and counting the people who walk through it. **Secondary** research is data someone else has already gathered and published — for example the council’s heritage overlay, an arborist’s report or Bureau of Meteorology rainfall records (2 marks). (b) Any **two** of: a **site visit and measure-up**, which yields the true dimensions, levels, thresholds and condition of the lane; a **sun, shade and wind study**, which yields when and where the lane is usable; an **accessibility audit**, which yields the gradients, widths and thresholds that currently exclude people; a **photographic record from fixed positions**, which yields a dated, comparable record of the existing condition (1 mark each: *method + what it yields*). (c) The two kinds of method answer different questions, and they often disagree. Interviews and surveys capture what people **say** — their reasons, feelings and the barriers they are aware of — while observation and counts capture what people **do**, including behaviour they would never think to mention: the worn desire line across the gravel is physical evidence of a route nobody described. Used together the methods **triangulate**, so a claim is supported by more than one kind of evidence — and where they disagree the gap is usually where the real design problem is hiding: the committee says the lane is neglected and merely needs decorating, while the counts and the desire line show it is already a working route (2 marks: *the say/do distinction + why using both is stronger*).

Q3. (a) Any **three** recorded conditions, for example: the lane measures 5.0 m × 24 m; there is a 350 mm step down to the car park with no ramp; the red ironbark has a 3.4 m tree protection zone in which no excavation is permitted; the whole lane is shaded at midday in winter; the surface falls 1:20 from east to west; a stormwater grate runs on the centre line; a worn desire line crosses from the car-park gate to the library service door; 41 people used the lane between 8 and 9 am and 12 between 4 and 5 pm; bins block 1.2 m of the width at the western end (1 mark each). (b) *One implication, for example:* because the two-storey wall on the north boundary shades the whole width at midday in winter, a courtyard for winter reading cannot rely on sunlight at all: it needs shelter from wind, pale paving and wall finishes to lift the light level, and artificial lighting — and the seating meant to catch sun in the warmer months belongs against the southern fence, furthest from the wall (2 marks: *the condition + a specific design consequence*).

(c) A place changes in time. The southern part of the lane is sunlit at midday in summer but the whole lane is shaded at midday in winter, and it carries 41 people in the morning peak but only 12 in the late afternoon. Recording one time would have produced a confident but false picture — and the problem the courtyard has to solve (a shaded, empty lane in the afternoon) only appears when the site is sampled more than once (2 marks).

Q4. (a) A brief's **design criteria** consist of the **purpose**, the **context**, the **audience or users** and a list of **design constraints**; together they are what the success of a design idea is evaluated against at Deliver. A **design constraint** is the kind of criterion set by the situation, which the designer must work within and cannot change — a dimension, a budget, a work window, a heritage listing, a standard. The remaining criteria come from the communication need and state what the solution must achieve. Either kind must be testable against the resolved solution (2 marks: *the four components + the distinction*). (b) Any **two**, with effects, for example: the **heritage listing** requires the terrazzo floor and the stair balustrade to be retained, so no fixings may be cut into the floor and any new counter must be free-standing; the **four-week January shutdown** is the only work window, so the solution must be buildable in four weeks and in stages; the **\$85 000 budget** rules out relocating the box office and pushes the team toward lighting, signage and furniture; **AS 1428.1** requires a compliant gradient (no steeper than 1:14 for a ramp, with landings), which fixes how much floor length any level change consumes; the **glare and heat through the glazed east wall between 8 am and 11 am** restricts what can be placed against that wall (1 mark each). (c) *Model criterion*: “a person entering the foyer for the first time can locate the box office from inside the entry doors without asking anyone.” It is testable — the team can observe first-time arrivals and count how many ask for directions (2 marks: *a criterion that is specific and can be checked*).

Q5. (a) A **finding** reports what the data says, plainly and with its evidence attached (“12 of the 18 people interviewed stopped just inside the doors”). An **insight** explains *why* the pattern exists, and is what a designer can act on (2 marks). (b) *Model insight*: arriving audiences hesitate because the box office cannot be seen from the entry — the only sign is above head height, on a dark wall, and behind the queue itself — so people stop in the doorway to work out where to go, and the queue backs out onto the footpath (2 marks: *a why-statement supported by all three pieces of data*). (c) Any one of: observe arrivals at a second, busier performance (and at a matinee) to check that the 22-second pause is not specific to one night; interview front-of-house staff, who watch this happen nightly; run an intercept survey of people already in the queue; or walk the entry sequence with a first-time visitor (1 mark).

Q6. (a) A **model** of the space, or **documentation drawings** — a plan, elevations and a section — carrying technical conventions. A rendered perspective, a concept board or a mock-up are accepted as supporting presentation formats (2 marks). (b) A design **concept** is a selected idea developed far enough to be tested, critiqued and evaluated — one of several options still in play. The design **solution** is the single resolved outcome that is refined, documented and presented at the end of Deliver (2 marks). (c) Documentation drawings are read by other people — a client, a builder, a council — who were not part of the design process and who must be able to build or approve the space from the drawing alone. Shared conventions for scale, line types, dimensions, symbols, levels and labelling mean every reader interprets the drawing the same way, and compliance with Australian Standards makes the drawing a legally and technically usable document rather than a picture (2 marks).

Q7. Panel A was produced by a **site visit** — an on-site sketch of the reserve — which is **primary** research. Panel B was produced by **observation with a people count** (a timed count in 10-minute blocks), which is **primary**. Panel C was produced by an **interview**, which is **primary** (1 mark each). (*The visitor figure quoted in panel D — 4 100 a year from the shire's website — is the only secondary item on the board.*)

Q8. The board sits at the end of **Discover**: it holds data — a site sketch, a 40-minute count, one interview and one published visitor figure. Identifying an environmental design problem, however, happens in **Define**, and none of Define's work has been done. The data has not been synthesised into a **finding** (what the evidence says, with the evidence attached), the finding has not been interpreted into an **insight** (*why* few people walk the loop — is it the surface, the weather, the signage, the access from the car park, or the birds not being visible?), and no **reframed problem** or **communication need** has been written. Instead the board jumps straight from data to a solution: “next step: design a new boardwalk”. That is a Develop activity, chosen before the problem is known, and it may not be the problem at all. ∴ the board records research but has not yet identified a design problem (4 marks: *locates the board in Discover; names the missing Define steps; identifies the jump to a solution*).

Q9. The only evidence about use is panel B: **six people** observed in four 10-minute blocks between 11.00 and 11.40 am, on a single Sunday, in light rain at 14 °C. That sample supports a claim about one 40-minute period in poor weather and nothing more; it cannot support a claim about the boardwalk's popularity in general, and the shire's own

figure of 4 100 visitors a year (which is itself seven years old) points the other way. *Rewritten as a finding: “six people used the boardwalk in the 40 minutes we observed it (11.00–11.40 am, Sunday 12 October, light rain, 14 °C)” (3 marks: the sample identified; why it cannot support the claim; an accurate rewrite carrying its evidence).*

Q10. Any two, each with a matched method. **1. Dimensions, levels and condition** — the board carries no measurements at all and the sketch is “not to scale”, so nothing can be drawn or costed: the team needs a **site visit and measure-up**, recording the boardwalk’s width and length, the heights of its decking and handrails, the car-park levels and the condition of the timber. **2. Accessibility of the route** — nothing records whether a person using a wheelchair or pram can get from the car park onto the loop: the team needs an **accessibility audit**, measuring gradients, widths, thresholds and handrails against AS 1428.1. *(Also accept: orientation, sun, shade and wind — a sun-and-shade and wind study; planning, heritage or environmental overlays and any wetland management plan — council and planning research; long-run weather — climate data.) (2 marks each: the gap named + an appropriate method.)*

Q11. The board is **weak as research that identifies a design problem**, though it has real strengths. Its strengths: it is genuinely **primary** work — the team went to the site, sketched it, observed it and spoke to somebody; the count in panel B is **quantitative and dated**, so another person could repeat it; the board has a clear **hierarchy** that lets a reader find the claim quickly; and one secondary source is cited.

Its weaknesses are more serious. First, the **sampling** is a single 90-minute visit on one wet Sunday morning, so the board describes the site in the rain rather than the site. Second, the **claim over-reaches its evidence**: “nobody uses it” rests on six observed people, and it contradicts the shire’s own visitor figure — which is itself out of date at seven years old. Third, no method on the board **hears a user**: panel B watches what people do, but the only method that asks anybody anything is one interview with a **volunteer coordinator**, a stakeholder speaking for an interest rather than a **user** of the boardwalk, so the board can report that six people walked the loop but never why the rest did not. Fourth, the research about the **place** is thin: no measurements, no levels, no orientation or north point on the sketch, no accessibility information and no planning or environmental overlays. Fifth, the board records no **finding, insight or communication need**, and instead nominates a solution (“design a new boardwalk”).

∴ the board is an honest but insufficient start. It should be treated as one round of Discover, not as a completed identification of the problem, and the team should return to the site at several times, survey and measure it, interview and count actual visitors, and only then attempt Define *(6 marks: strengths, at least three substantiated weaknesses, and an overall judgement with a recommendation).*

Q12. *Model communication need:* “visitors arriving at the SPINEBILL car park need to be shown, before they set out, what the boardwalk loop offers, how long it takes and how accessible it is, so that they choose to walk it.” *(The board’s evidence for it, and the limit of that evidence: the shire’s published figure of 4 100 visitors a year — dated, but the only visitor figure the board has — says the reserve does draw people; the only count of the loop itself recorded six walkers in 40 minutes; and the volunteer coordinator says “hardly anyone walks the loop any more”. The car park is the one arrival point the sketch records, so the board points to a gap between coming to the reserve and walking the loop. It cannot yet measure that gap, because arrivals were never counted — so the need is provisional until the team counts the car park as well as the boardwalk.)*

A **communication need** states what must be communicated, to whom and where; it names no artefact, so it leaves the designer free to answer it with an entry threshold, an interpretive marker, a resurfaced approach, planting, lighting or a map. A **design solution** is one specific answer — “a new boardwalk”, or “a sign at the car park”. Naming the solution first, as this board does, skips Define and locks the team into an answer before the problem is understood; it also cannot be tested, because there are no criteria to test it against *(4 marks: a defensible need tied to the board’s evidence + the distinction explained).*

Q13. The shortcoming is the **identification of a research participant**. Panel C names Mrs J. Karras, gives her role and organisation, and shows a photograph taken at the car park — enough for any reader of the board to identify her, and to attach a critical opinion about the shire’s reserve to a named local volunteer. The team should have obtained **informed, voluntary consent** covering exactly how the material would be used, then **de-identified** the contribution — for example “volunteer coordinator, local Landcare group” with no photograph — retaining the quotation, which is the evidence, but not the person’s identity. The photograph should only appear with explicit, recorded permission for that use *(3 marks: the shortcoming identified as identification of a participant; the consent obligation; de-identification as the fix).*

Q14. A single Sunday morning visit records one moment, and this one was atypical in three ways that all push the count down: it was **raining**, it was **14 °C**, and it was a **weekend mid-morning** — outside the times when many people walk. Use of a wetland varies with the hour (birds are most active at dawn and dusk), the day (school groups on weekdays, families at weekends), the season and the weather, so a 40-minute count in the rain cannot show whether the boardwalk is used. *A time-sampling plan:* observe the same fixed point for 40 minutes on at least six occasions spread across **early morning, midday and late afternoon**, on **two weekdays and two weekend days**, in **fine and in wet weather**, and in at least **two seasons**; record the date, time, weather and temperature with every count, and count the car park as well as the boardwalk so arrivals can be compared with users. Combine this with an on-site survey of the visitors observed (4 marks: *why one visit is insufficient, with the specific atypical conditions; a plan varying time of day, day of week, weather and season, with conditions recorded*).

Q15. Any three of the recorded conditions, each with its constraining effect. **1. Shade.** The two-storey library on the lane's north boundary puts the whole 5.0 m width in shade at midday throughout winter (a 7 m wall casts a 12 m shadow when the winter sun is 30° above the horizon), so the courtyard cannot be planned around winter sun: sunny seating must sit on the southern side against the fence, where the shadow is shortest in the warmer months, and the design must rely on wind shelter, pale surfaces and artificial light for the colder months. **2. The tree protection zone.** No excavation is permitted within 3.4 m of the red ironbark, so footings, paving on deep bedding, drainage trenching and any wall must be kept outside that circle; anything inside it must sit on the existing surface. **3. The 350 mm step at the western end.** The lane is not currently enterable without a step, so either a compliant ramp must be fitted into the 1:20 falling surface or the courtyard must be entered from Main Street only — a decision that changes the whole layout. (Also accept: *the 5.0 m width, which must carry both a through route and seating, and which the bins already reduce by 1.2 m; the 1:20 fall east to west, which limits where level seating and paving can sit and directs stormwater; the stormwater grate on the centre line, which cannot be built over; the worn desire line, which shows a route the design must keep clear.*) (6 marks: 2 marks per condition — condition identified accurately from the site analysis + the specific limit it places on the design.)

Q16. The role of **Develop** is to generate a wide range of spatial ideas that answer the insight, before any one of them is refined. Working **divergently**, the team would brainstorm many ways to make the box office visible from inside the entry doors: **zoning diagrams** testing the counter, the queue and the circulation route in different positions within the 14 m × 9 m floor; **ideation sketches** of a lowered, lit counter, a suspended sign at eye level, a change of floor finish leading the eye, a free-standing kiosk clear of the heritage terrazzo; and quick **eye-level perspective views** taken from the doorway, because that is the only viewpoint the insight is about. Ideas would experiment with the **design elements and principles** — tone and colour contrast against the dark timber wall, hierarchy and scale in the signage, and a deliberate visual path from door to counter — and each would carry an **evaluative annotation** stating the decision, the reason and its weakness against the brief (for example, “kiosk pulled 3 m clear of the glazed wall to avoid morning glare, but it reduces the queue space”). ∴ Develop's role is to turn one insight into many testable options, with the reasoning recorded, ready for Deliver to converge (4 marks: *divergent generation; at least two named Develop methods used specifically; elements and principles; evaluative annotations tied to the insight*).

Q17. At Deliver the team converges. It should first present its strongest **concepts for critique** — to peers, and to the centre's front-of-house staff and manager, who know the arrival problem better than anyone — and gather **feedback** on the design as it is read, not as it was intended. It should then apply **convergent thinking**, using the **design criteria** from the brief rather than personal preference to select one concept: can a first-time visitor locate the box office from inside the entry doors — and, among the design constraints, is every route compliant with AS 1428.1, are the terrazzo floor and the balustrade untouched, and is the work buildable within the January shutdown and the \$85 000 budget? A concept that reads beautifully but requires fixings into the heritage floor fails a criterion and is set aside. The selected concept is then **refined and resolved**: dimensions, levels, materials, finishes, lighting and signage sizes are fixed, and the team evaluates the extent to which the resolved solution meets the brief, iterating where it does not.

For the **presentation format** I would choose **documentation drawings** — a scaled floor plan, two elevations and a section through the entry — **supported by a rendered one-point perspective taken from just inside the entry doors**. The justification is the criteria themselves: only a scaled plan can prove the gradient and circulation widths comply with AS 1428.1 and that nothing is fixed into the terrazzo, and only a perspective from the doorway can demonstrate the one thing the brief is actually about, which is what an arriving visitor can see. A physical model would show the volume of the foyer well, but it could not carry the dimensions and technical conventions a builder and the council need for a four-week works program (6 marks: *critique and feedback; criteria-driven convergent*

selection; refinement and resolution; a format chosen and justified against the brief, with a limitation of the alternative acknowledged).

Q18. Both modes are used twice, and the process alternates between them. **Divergent thinking** is open, curious and imaginative, and suspends judgement; **convergent thinking** is analytical, comparative and reflective, and seeks to summarise, categorise and synthesise. In **Discover** the designer is divergent: they research widely — measuring the site, sampling it at different times, counting people, interviewing users and non-users, reading planning documents — without deciding yet what the problem is. In **Define** they are convergent: the same material is clustered, categorised and reduced to findings, an insight, a reframed problem and a brief with testable criteria. In **Develop** they are divergent again: many spatial ideas are generated rapidly, inspiration is sought from other times and places, and options are multiplied rather than judged. In **Deliver** they are convergent again: feedback and the design criteria are used to select, refine and resolve a single solution.

The similarity is that each mode is unusable without the other — divergence with no convergence produces a folio of unresolved options, and convergence with no divergence produces the first idea anyone thought of. The difference is what each mode is *for*: divergence expands the field of possibility (about the problem in Discover, about the answer in Develop), while convergence commits (to a problem definition in Define, to a solution in Deliver). ∴ on an environmental project the two diamonds ask two different questions — “what is really wrong with this place?” and “what is the best thing to do about it?” — and each needs one expansion and one commitment (*6 marks: both modes defined; each of the four stages allocated correctly; a congruent comparison drawing out both a similarity and a difference*).

Q19. Environmental design is the design of **environments** — spaces such as buildings, interiors, gardens, streetscapes and exhibitions — and is the field of practice of architects, landscape architects, interior designers and exhibition designers. **Sustainable design** is a set of **practices and mindsets** aimed at reducing harm to the planet — circular material use, reduced waste and energy, longer life — and can be applied in any field, including the design of a poster or a lunchbox.

Confusing them misreads a brief in both directions. A student who reads “environmental design project” as “design something eco-friendly” may produce a recycled-materials object and never design a **space** at all — failing the outcome. In reverse, a student who assumes an environmental brief must be about sustainability may spend the folio on material choices while ignoring the site’s orientation, access and users, which is what the brief actually asked about (*3 marks: both terms defined + a consequence for reading a brief*).

Q20. Online mapping, imagery and council documents are **secondary** sources: someone else recorded them, at another time, for another purpose. They are genuinely useful for context — boundaries, zoning, overlays, an existing plan — but they cannot supply the information an environmental design depends on. They do not give **levels and thresholds** (the 350 mm step at a gate does not appear in an aerial image), they do not give **sensory and temporal conditions** (glare, shade at 3 pm in July, the noise of a 6 am waste collection, wind funnelling down a lane), they do not give **behaviour** (the worn desire line, the queue that forms at 7.40 pm), and they are frequently **out of date**. A problem defined without on-site primary research is therefore likely to be the wrong problem, and any drawing based on it will not fit the site (*3 marks: secondary nature identified; at least two specific things only primary research yields; the consequence*).

Q21. A **precedent study** is research: the designer visits or studies environments that answer a similar problem and records **why** they work or fail — how a laneway handles shade, how an entry signals that it is public, how a boardwalk manages wet timber. What is taken away is *understanding*, which then informs an original response to a different site, different users and a different brief. **Copying** takes the design itself — the form, the layout, the graphics or the details — and reproduces it as the answer.

The obligations are both legal and ethical. Copyright subsists automatically in an original design (including drawings and plans), so reproducing someone’s design without permission may infringe it, and reproducing a registered trade mark or a protected cultural design carries further obligations (Chapters 2B and 8). Ethically, a designer credits sources of inspiration in their annotations and does not present another person’s work as their own thinking. ∴ study precedents openly and cite them; produce your own design (*3 marks: the distinction as understanding vs reproduction; the legal obligation; the ethical/citation obligation*).

Q22. (Model response, using the SPINEBILL WETLAND RESERVE. Accept an equivalent response for WATTLEBIRD LANE or the SILVEREYE ARTS CENTRE foyer.)

Discover. I would work divergently and research both the place and the people. **Method 1 — a site visit and measure-up** on six occasions across early morning, midday and late afternoon, on weekdays and weekends and in fine and wet weather: recording the length, width and condition of the boardwalk, the levels and surface of the car-park approach, the orientation, shade and wind, and dated photographs from fixed positions. **Method 2 — an on-site intercept survey and people count** of visitors at the car park and on the loop, asking what they came for, how far they walked and what stopped them, and counting arrivals against loop users. I would add secondary research — the shire’s reserve management plan, any environmental overlay, and current visitor figures — and would consult the Traditional Owners of the Country the wetland sits on before any interpretive content is proposed.

Define. Convergently, I would cluster the material into findings, then ask why. A likely insight is that visitors arrive, look at the pond from the car park and leave, because nothing at the arrival point tells them what the loop offers or how long it takes. The communication need would be that **visitors arriving at the car park need to understand, before they set out, what the loop offers, how long it takes and how accessible it is.** **Design criterion:** “a first-time visitor standing at the car park can state how long the loop takes and whether it is step-free, without asking anyone” — testable by observing and asking arriving visitors.

Develop. Divergently, I would generate many options with zoning and schematic diagrams and rapid ideation sketches — an arrival threshold, a shelter, an interpretive marker at the water’s edge, a resurfaced approach, seating that frames a view of the birds — experimenting with the design elements and principles and annotating each idea with its reason and its weakness against the criteria.

Deliver. I would present concepts for critique to peers and to reserve users, apply the feedback and the criteria convergently to select and refine one concept, and resolve its dimensions, materials and details. I would present the resolved solution as **documentation drawings** — a site plan, an elevation and a section of the arrival threshold, drawn with technical conventions complying with Australian Standards — supported by a rendered perspective from the car park, because the criterion is about what an arriving visitor can see and understand (6 marks: all four stages applied to the chosen site; two research methods named and used; one testable criterion; a presentation format named and suited to an environmental solution).

Theory

This Area of Study asks one question: **how does design reflect and respond to the time and place in which it is made?** This subtopic answers both halves of it. *Time* is the business of **design styles and traditions** — the visual languages designers inherit, and how you draw on them without simply copying. *Place* is the business of **contextual factors** — everything about a site and its circumstances that changes what a designer decides.

Two neighbouring subtopics do related work. Subtopic 6A covers the stages of the VCD design process as they apply to environmental projects, and the research methods used to identify an environmental design problem. Subtopic 6C covers the five named factors that impact environmental design projects — **economic, technological, cultural, environmental and social**. The study design treats those five as one *kind* of contextual factor, so the two subtopics overlap deliberately: here you learn to read the **place, its time and its rules**, and in 6C you weigh the five named pressures. When you answer a question, say which you are working with.

The field. An **environmental design** project is the design of a space rather than an object, a message or an interface. It covers **architecture, interior design, exhibition design and landscape design**. The examples in this subtopic span all four, because the vocabulary changes with the field: an architect speaks of massing, setback and orientation; an interior designer of fit-out, fabric and finishes; an exhibition designer of circulation, cases and lux levels; a landscape designer of levels, planting and microclimate.

Style, tradition, movement — three different words

A **design style** is a recognisable set of visual characteristics shared across a body of design work, and it can usually be dated and located. A style is read off the *design elements and principles* — form, line, shape, colour, texture, proportion, balance, pattern — as they appear in real material.

A **design tradition** is a way of designing and making that is passed down within a community or a place over time: the knowledge, techniques, materials, motifs and purposes that people keep using because they work. A tradition is sustained by **practice**, not by fashion, and it *continues* — which is why “tradition” is never a synonym for “the past”.

A **design movement** is a group of designers consciously pursuing shared ideas in a period, often with a published position about what design should be. A movement produces a style; a style does not need a movement.

Contemporary means of the present time. For a finished *work*, that is design of roughly the last two decades. For a *style, tradition or movement*, the date it began is not the test — what counts is whether it is **still current practice**: whether designers are working in it now and buildings are still being made to it. Passive House began in 1991 and is contemporary, because it is what practitioners certify buildings to today; the 1930s early-modern idiom is historical, because no one designs in it as live practice. **Historical** means of an earlier period that is no longer current practice. Both are in scope: the key skill is to “draw inspiration from **contemporary and historical** design styles and traditions”.

READING A STYLE — the seven indicators, and the vocabulary to keep apart

1 FORM & MASSING

the geometry of the whole: a single rectangular block, symmetrical about a centre line

2 STRUCTURE & MATERIALS

load-bearing brick with rendered dressings — the material is left visible and does the work

3 COLOUR & FINISH

dark red brick banded with cream render — a two-colour polychrome pattern worked into the wall itself

4 ROOFLINE & SKYLINE

a raised parapet with a moulded cornice and a central pediment, hiding the roof behind it

5 ORNAMENT & DETAIL

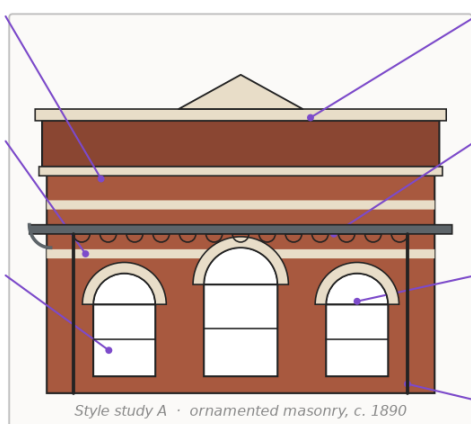
applied decoration: cast-iron lace, a moulded cornice, rendered hoods over every opening

6 OPENINGS

small arched heads, evenly spaced, tall and narrow in proportion — what brick construction allowed

7 RELATION TO GROUND & STREET

built to the boundary, with a deep verandah carried over the public footpath on cast posts



STYLE, TRADITION, MOVEMENT — three different words

style	a recognisable set of visual characteristics shared by a body of work, and datable — read it off the seven indicators above
tradition	a way of designing and making passed down within a community or place, sustained by practice — it continues; it is not a period
movement	a group of designers consciously pursuing shared ideas in a period, often with a published position

Reading a style — the seven indicators

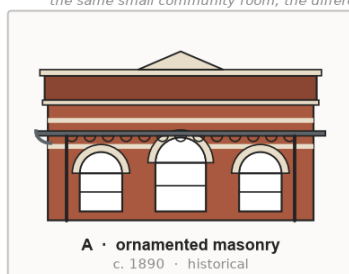
Naming a style is worth almost nothing on its own. What earns marks is *describing* it in design terminology, and the reliable way to do that is to work through seven indicators in order:

1. **Form and massing** — the geometry of the whole. One block or several? Symmetrical or asymmetrical? Horizontal or vertical in proportion?
2. **Structure and materials** — what it is made of, and whether the structure is shown or hidden.
3. **Colour and finish** — the palette, the texture, the sheen; painted, rendered, raw or plated.
4. **Roofline and skyline** — pitched, flat, skillion, curved, sawtooth; parapet or eaves.
5. **Ornament and detail** — applied decoration, or its deliberate absence.
6. **Openings** — the shape, size, proportion and rhythm of windows and doors.
7. **Relation to ground and street** — built to the boundary or set back; raised, sunk or terraced; what happens at the threshold.

Two further readings are worth adding for a space you can enter: the **plan organisation** (cellular rooms or one open volume) and the **quality of light** (bright and directional, or even and diffuse).

ONE BRIEF, THREE STYLE LANGUAGES — and the reason behind each signature

the same small community room; the differences are not taste alone — each signature answers the technology, beliefs and rules of its own time

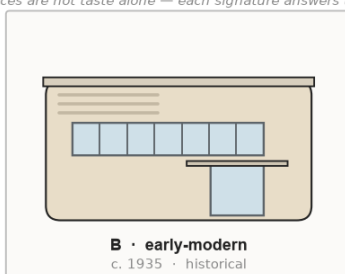


the style signature

- parapet, cornice, central pediment
- small arched openings, symmetrical
- applied cast-iron and render ornament
- polychrome brick banding
- bullnose verandah over the footpath

why those features?

load-bearing brick cannot span wide, so openings stay small and arched; the verandah shaded a shopfront and sheltered the footpath; mass-produced cast iron and pressed cement made ornament cheap — and ornament signalled the owner's standing in the street

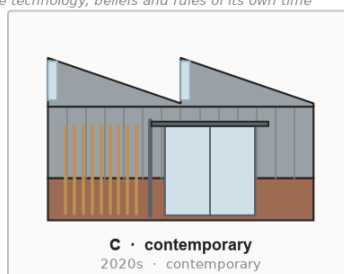


the style signature

- horizontal massing, streamlined corner
- a ribbon of steel-framed glazing
- flat parapet with a thin coping
- a cantilevered hood over the entry
- no applied ornament at all

why those features?

a steel and reinforced-concrete frame carries the load, so the wall is freed of it and glass can run in a continuous horizontal band; the cantilever exists to display the new technology; and the movement's own published position held ornament to be dishonest — plainness is the style



the style signature

- a two-bay south-facing sawtooth
- recycled-brick base, steel cladding above
- a tall glazed opening with a shading hood
- a vertical timber batten screen
- structure and materials left unpainted

why those features?

performance drives the form: south glazing gives even, glare-free light and the hood keeps summer sun off the glass; the brick is salvaged from the site, so the material answers a waste target; and heritage policy asks new work to be legible of its own time rather than a copy of what stands nearby

Styles differ because their reasons differ

The three studies above answer the same brief — a small single-storey community room — in three style languages. The differences are not taste alone. Each signature is an answer to the **technology, beliefs and rules** of its own time, and a strong response says so.

- **Study A (c. 1890)** uses load-bearing brick, which cannot span wide openings, so the windows are small, arched and repeated. The verandah shades a shopfront and shelters the footpath. Mass-produced cast iron and pressed cement had just made ornament cheap, and ornament advertised the owner's standing.
- **Study B (c. 1935)** uses a steel and reinforced-concrete frame, which carries the load, so the wall is freed of it and glass can run in a continuous horizontal ribbon. The cantilevered hood exists partly to display that new technology. And the movement behind the style held ornament to be dishonest, so plainness is not an absence of style — it *is* the style.
- **Study C (2020s)** is driven by performance and policy: south glazing for even, glare-free light; a hood sized to exclude summer sun; brick salvaged from the site to meet a waste target; and a heritage policy that asks new work to be legibly of its own time.

You will also meet named historical movements and traditions as reference points — Art Nouveau, the Arts and Crafts movement, Art Deco, the Bauhaus and international Modernism, Brutalism, mid-century modern, Postmodernism, Scandinavian modern, Japanese *sukiya* — as well as regional and vernacular traditions: the Australian verandah, the raised timber house on stumps, the woolshed and the sawtooth factory, the dry-stone wall, the courtyard house.

Vernacular design is work built by local people from local materials using inherited knowledge of the local climate, usually without a professional designer. It is often the most instructive source of all, because every one of its features had to earn its place.

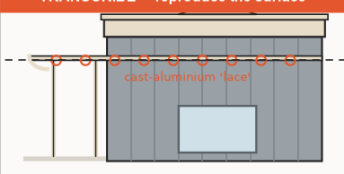
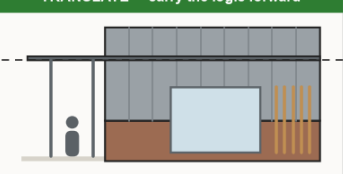
Watch-out — keep the four words apart. A **style** is a set of visual characteristics; a **tradition** is a way of making passed down in a place; a **movement** is a group of designers with a shared position; a **period** is only a span of dates. “Victorian” is a period, “Italianate” a style, “the verandah” a tradition, “the Bauhaus” a movement.

Watch-out — describe, do not label. “It is Art Deco” identifies nothing. Work the seven indicators: name the massing, the materials, the roofline, the openings, the ornament, the colour and the way the building meets the ground. A description built from the design elements and principles is what is marked.

Drawing inspiration — translate, do not transcribe

The key skill is to “**draw inspiration** from contemporary and historical design styles and traditions when responding to an environmental design brief”. Inspiration is not reproduction. Copying the surface features of a historical style onto a new building produces **pastiche** — a replica of appearance without the reasoning that produced it.

TRANSLATE, DO NOT TRANSCRIBE — inspiration is not reproduction

THE SOURCE · 1890s shopfront verandah	TRANSCRIBE · reproduce the surface	TRANSLATE · carry the logic forward
		
A bullnose verandah on cast posts, carried out over the public footpath, with a cast-iron lace frieze and a parapet above. ITS LOGIC — why the feature existed: · shade to a shopfront window and its goods · shelter for people standing on the footpath · a threshold that belongs to the street, not only to the building · a display of status, made cheap by cast iron	A reproduction bullnose, moulded cornice and cast-aluminium 'lace' bolted onto a new steel-framed shed. WHY IT FAILS: · the lace carries no logic — no craft, no cost reason, and no shade in it · a visitor cannot tell 1890 from 2026, which heritage practice asks them to be able to do · it solves none of the site's real problems	A plain steel canopy, 2.4 m deep, set at the same 3.2 m soffit datum as the verandahs opposite. No applied ornament. WHY IT WORKS: · it keeps the shelter and the threshold, and holds the street's datum line and rhythm · it is legibly new, so old and new both read · on the west face vertical battens answer the same logic — a low sun defeats a flat roof
DRAWING INSPIRATION — three steps, in this order 1 identify the feature (use the seven indicators) 2 ask why it existed — what problem did it solve, and for whom? 3 re-express that logic with today's materials, technologies and requirements the dashed line is the shared 3.2 m verandah datum		

The move that separates the two is a single question: **why did that feature exist?** Every feature of a historical style solved a problem for somebody — a climate problem, a structural problem, a cost problem, a ritual or social problem. Find that problem, and you can answer it again with today’s materials and requirements. Three steps, in order:

1. **Identify the feature**, using the seven indicators.
2. **Explain its logic** — what problem it solved, for whom, and under what constraints.
3. **Re-express that logic** in your own solution, with today’s materials, technologies and rules.

The figure above works one feature through all three steps. The 1890s bullnose verandah did four jobs: it shaded a shopfront window, sheltered people on the footpath, made a threshold that belonged to the street as much as to the building, and displayed the owner’s standing. *Transcribing* it — bolting a reproduction bullnose and cast-aluminium “lace” onto a new steel shed — reproduces only the fourth job, badly, and leaves a viewer unable to tell 1890 from 2026. *Translating* it keeps the shelter and the threshold in a plain steel canopy set at the same soffit datum as the verandahs opposite, and answers the actual shading problem where it actually occurs — on the west face, where a low sun defeats a horizontal roof and vertical battens are needed instead.

When matching a historical form is the right answer. Sometimes a planning scheme, a heritage overlay or a strong streetscape requires new work to be **sympathetic** — to hold the street’s scale, setback, rhythm, datum lines and material family. That is not pastiche. Sympathetic new work matches the *proportions and discipline* of its neighbours while remaining readable as new; pastiche imitates their *ornament* and pretends to be old. Australian heritage practice states the principle directly: in the Burra Charter, Australia ICOMOS advises that new work should be readily identifiable as new. Hold the datum, drop the lace.

Watch-out — translate, do not transcribe. “I was inspired by Art Deco so I added chevrons” is not a design decision. Name the feature, name the reason it existed, and name what you did instead. A copied motif with no logic behind it is a pastiche, and it is marked as one. Pastiche is not only a historical habit: a shading fin wrapped evenly around all four faces of a building because that grid now *reads* as environmentally responsible — fins on a south wall with no sun to stop — is the same failure. The historical version copies ornament; the contemporary version copies the look of performance.

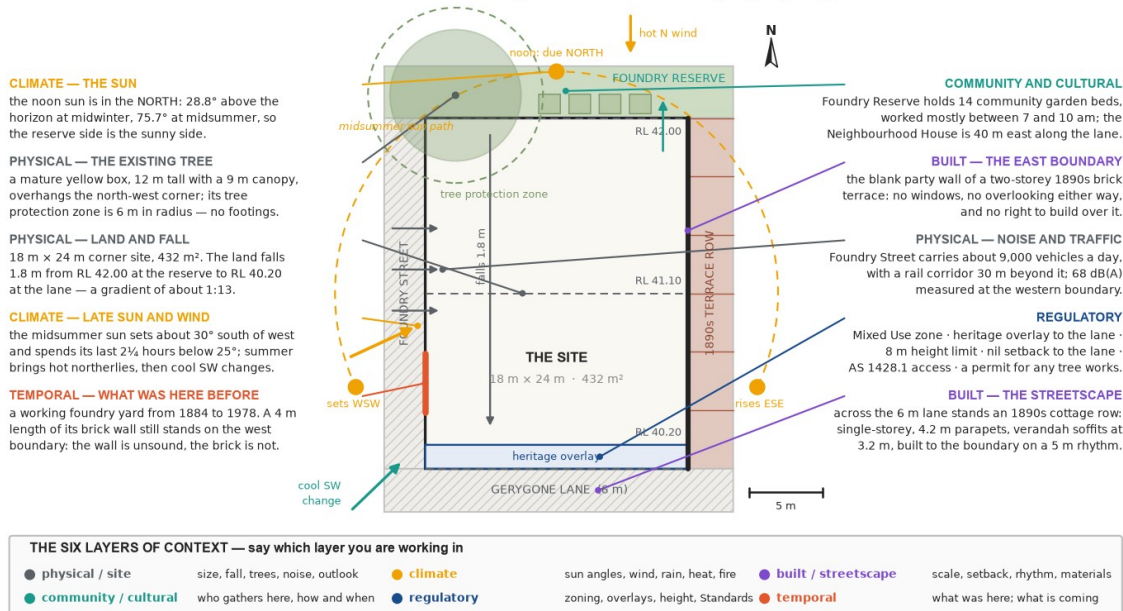
Watch-out — do not judge a historical style by today’s requirements. An 1890s cottage has small windows because brick walls carried the roof and glass was dear; it has no insulation because no one required any. Explaining a historical style means reconstructing the conditions of *its* time. Ranking it against ours explains nothing.

Watch-out — some traditions belong to somebody. Where a design tradition, motif, story or knowledge belongs to a community — in Australia, particularly to Aboriginal and Torres Strait Islander peoples — “inspiration” is not a licence. Consultation, consent, attribution and benefit-sharing are required, and what is legal is not automatically ethical. Chapter 8 covers the protocols in full; this subtopic assumes you will follow them.

Contextual factors — the six layers

Context is the setting and circumstances in which a design is created, used and experienced. For an environmental design project the context is the **place**, and it is far more than the shape of the block. It is useful to read it in six layers.

GERYGONE LANE — reading the context before designing anything



- **Physical / site** — dimensions, boundaries, fall and levels, soil and drainage, existing vegetation and structures, noise, outlook, access.
- **Climate** — sun angles by season, prevailing and seasonal winds, rainfall, humidity, temperature range, and hazards such as bushfire, flood, frost or salt.
- **Built / streetscape** — the scale, setback, rhythm, roof forms, materials and datum lines of what already stands nearby, and the character of the street itself.
- **Community / cultural** — who uses the place now, how and when; whose Country it is; what the place means to people; who is currently excluded from it.
- **Regulatory** — zoning, overlays, height limits, setbacks, overshadowing tests, Australian Standards (for example AS 1428.1 for access), the National Construction Code, and permits.
- **Temporal** — the hour and the season, what was on the site before, and what the place is becoming.

The figure above is a **site analysis** of GERYGONE Lane, the site used through the rest of this subtopic: an 18 m x 24 m corner site of 432 m², falling 1.8 m from a community reserve on its northern boundary down to a heritage-listed laneway on its south, with a busy street and a rail corridor to the west and a blank party wall to the east. Every note on it is an **observation**, not yet a decision. That is the correct order of work: read the place first.

The chain — reading, implication, decision, effect

A contextual factor is not a description of the finished space. It is a pressure that made the designer **choose differently than they otherwise would have**. A complete analysis has four links, in order:

1. **The reading** — what you observed about the place, stated specifically. Not “the site slopes” but “the land falls 1.8 m from the reserve to the lane, about 1:13”.
2. **The implication** — what that means for the space. “A single level floor will sit 600 mm above the lane at the entry, so the entry needs a compliant ramp.”
3. **The decision** — what the designer did. This is the link most often missing.
4. **The effect** — the consequence for the people who use the place, or for the place itself.

If you cannot finish the sentence “because of this, the designer decided to ...”, you have not yet identified a contextual factor. Two readings traced through all four links will always beat six readings listed.

Sun and orientation in Australia — get the hemisphere right

More marks are lost on this than on anything else in the Area of Study, so learn it properly. In the southern hemisphere:

- The midday sun is in the **north**. A north-facing wall or window is the sunny side.



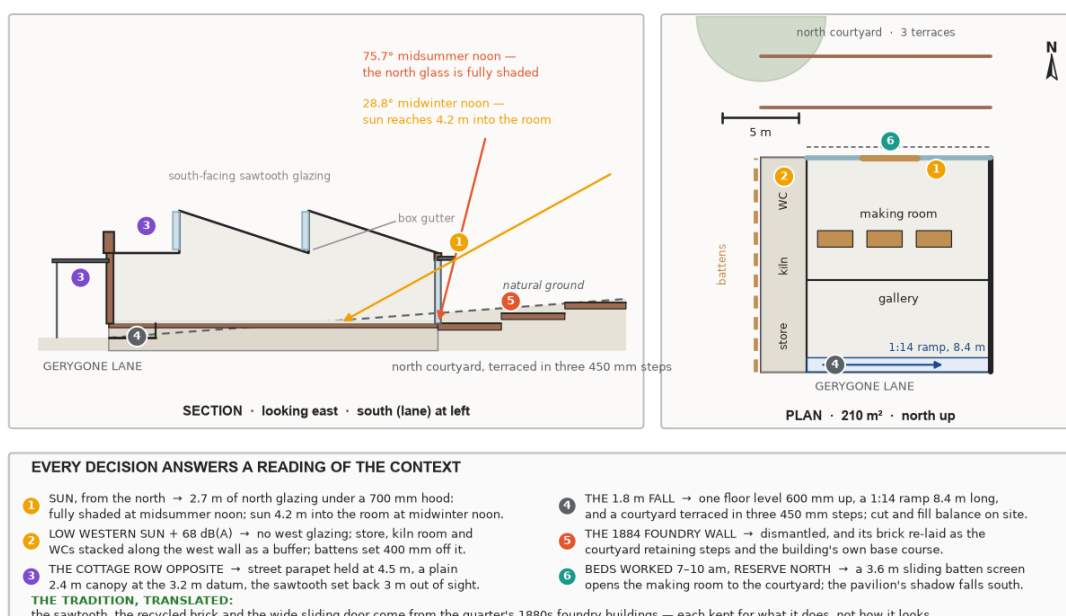
- The noon sun is **high in summer and low in winter**. In a temperate southern city near latitude 37.8° S it stands about **75.7°** above the horizon at midsummer noon and only about **28.8°** at midwinter noon.
- Because of that difference, a **horizontal** shading device works beautifully on the **north** face: it can be sized to block the high summer sun and still admit the low winter sun. A 700 mm hood over 2.7 m of north glass shades the glass completely at midsummer noon, yet at midwinter noon lets the sun reach about 4.2 m into the room.
- The **west** is the hard face. In midsummer the sun sets about **30° south of west** and spends its last two and a quarter hours below **25°** above the horizon. A horizontal hood cannot stop a sun that low. The west needs **vertical** devices — fins, battens, screens, a planted buffer — or no glass at all.
- The **east** brings the same low-angle problem in the morning, though against cooler air.
- The **south** receives no direct sun in winter and gives even, diffuse, glare-free daylight all year. That is why Australian factories and woolstores were roofed with **south-facing sawtooth** glazing, and why south light still suits making, drawing and displaying.
- A building's shadow falls **south** of it. That single fact decides many overshadowing questions.

Watch-out — north is the sun side. Do not import northern-hemisphere reasoning. In Australia, north-facing glazing is the asset, west-facing glazing is the liability, and horizontal shading belongs on the north while vertical shading belongs on the west.

WEEBILL Pavilion — the response

WEEBILL Pavilion is a 210 m² makers' room and gallery built on the GERYGONE Lane site in 2026 for the Foundry Street Neighbourhood House. It is an original design example, and every decision in it answers a reading from the site analysis.

WEEBILL PAVILION, GERYGONE LANE — a design that answers its context



The **climate** readings shape the two long faces. To the north, 2.7 m of glazing under a 700 mm hood gives the making room winter sun deep into the plan and full shade at midsummer noon. To the west, where a low sun and 68 dB(A) of traffic and rail noise arrive together, there is no glazing at all: the store, the kiln room and the WCs are stacked along that wall as a single thermal and acoustic buffer, and a vertical spotted-gum batten screen stands 400 mm clear of the brick. The making benches sit under the **south-facing sawtooth**, which delivers even, glare-free light over the work all day.

The **built** reading shapes the lane frontage. The cottage row opposite is single-storey with 4.2 m parapets and verandah soffits at 3.2 m, built to the boundary on a repeating 5 m rhythm. WEEBILL holds a street parapet at 4.5 m, hangs a plain steel canopy 2.4 m deep at the same 3.2 m soffit datum, and sets the sawtooth back 3 m so that its 5.4 m ridge stays below the sight line from the opposite footpath. (All of these heights are measured from the lane footpath, which is the datum the street shares; the pavilion's own floor sits 600 mm above it.)

The **physical** reading shapes the section. Rather than cut a level platform out of a site that falls 1.8 m, the designer set one floor level 600 mm above the lane, resolved the entry with a 1:14 ramp 8.4 m long inside the south wall — within the maximum gradient AS 1428.1 allows — and terraced the north courtyard in three 450 mm steps, which are seat height. Cut and fill balance on site, so no soil is trucked away.

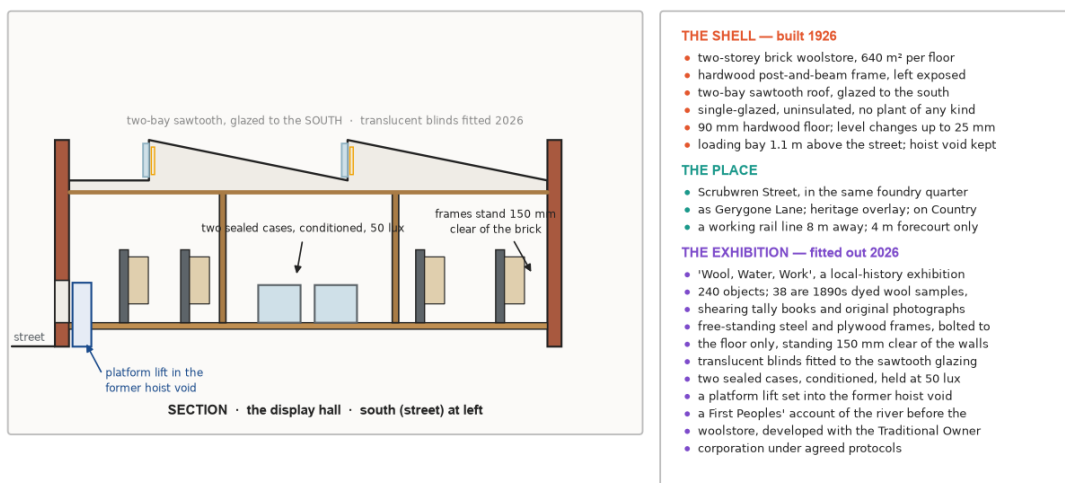
The **temporal** reading supplies the material. The 4 m of unsound 1884 foundry wall on the west boundary was dismantled and its brick re-laid as the courtyard retaining steps and the building's own base course. The **community** reading opens the plan: a 3.6 m sliding batten screen lets the making room work as one space with the courtyard, and because the pavilion is held on the southern part of the site and a building's shadow falls south, that shadow lands on its own lane frontage instead of reaching north into the reserve and its garden beds.

The tradition, translated. The sawtooth, the recycled brick and the wide sliding door all come from the 1880s foundry and woolstore buildings of the quarter. None of them is quoted for its appearance. The sawtooth is kept because south glazing lights a workbench; the brick is kept because it was already on the site; the sliding door is kept because a making room needs to open wide. That is the difference between a tradition carried forward and a style copied.

SCRUBWREN Woolstore — context you inherit

Not every environmental project starts with an empty site. In **adaptive reuse**, the existing building *is* the context, and its style, fabric and faults are all readings you must work with.

SCRUBWREN WOOLSTORE — a 1926 shell, a 2026 exhibition inside it



SCRUBWREN Woolstore, Scrubwren Street · built 1926, exhibition fitted out 2026 · interior and exhibition design · an original ClassBasics design example

SCRUBWREN Woolstore is a two-storey brick woolstore of 1926 in the same quarter as Gerygone Lane, with an exposed hardwood post-and-beam frame, a two-bay south-facing sawtooth roof, a 90 mm hardwood floor and a loading bay 1.1 m above the street. In 2026 it received a local-history exhibition, *Wool, Water, Work*. The facts of the shell and of the fit-out are listed with the figure; the reasoning behind them is what the questions in this subtopic ask you to supply.

Watch-out — context acts on the designer. “The site is noisy” is a reading, not an analysis. “68 dB(A) at the west boundary, so the designer put the store, kiln room and WCs along that wall as a buffer and gave it no operable windows” is an analysis. State the decision.

Watch-out — context is wider than the block, and it is not the list of five factors. Say which layer you are working in — physical, climate, built, community, regulatory or temporal. If you mean the economic, technological, cultural, environmental or social pressures on the project, name those (6C).

Watch-out — name the field and use its language. Architecture, interior, exhibition and landscape design have different vocabularies and different conventions. A response about an exhibition that never mentions circulation, cases or light levels is not yet a response about exhibition design.

Units 3 & 4 preview — beyond the Units 1&2 study design. Styles, traditions and context all return in Units 3 & 4, but attached to two **methods** this course does not ask of you. First, in Unit 3, Area of Study 2 you must read a design example you have never seen before, supplied in an examination Resource Book, and explain under timed conditions how contextual factors and the five named factors influenced the designer’s **aesthetic decisions** — naming the specific aesthetic and tracing it through the elements and principles. Second, Unit 3, Area of Study 1 studies the practices of **contemporary designers**, defined there as designers practising from about 2000 onward — a convention about *people currently in practice*, not a cut-off date for styles — and the factors that shape how they work rather than what they make. Neither the timed unseen-example method nor the aesthetic- decisions analysis is required here, and no question in this subtopic uses them. In this unit you research a style and a place you have chosen, and use both to inform and justify your own design work.

Named styles and movements

The traditions above are anonymous — nobody signed the verandah. Named styles and movements can be pinned to designers, buildings and dates; the seven indicators read them the same way.

Art Deco and the interwar commercial Gothic (c. 1925–1939) ran vertical piers unbroken from footpath to skyline, replaced the cornice with a stepped or turreted crown, and stylised its ornament in a manufactured cladding. The **Manchester Unity Building** on the corner of Collins and Swanston streets, Melbourne — **Marcus Barlow**, completed 1932 — is twelve storeys of concrete-encased steel clad in moulded glazed terracotta faience, crowned by a tower of diminishing buttresses rising about 24 m above the roof. Its verticality broke deliberately from the heavy cornices of 1920s commercial work.

The Australian rural shed, translated (1970s–80s). Glenn Murcutt’s **Magney House** at Bingie Point, New South Wales (1982–84) is a tubular steel frame on a repeating bay, under a very thin steel-skinned roof with one long overhang, north glazing behind retractable external louvres, a closed south wall against the southerly wind, and an oversized gutter draining to two downpipes. Murcutt has described an earlier house of his own, the Marie Short House, as post-and-beam like an Australian woolshed.

Passive House (from 1991) is a movement in the strict sense: a published performance position rather than a look, first built at Darmstadt-Kranichstein in 1991. **Grimshaw’s Woodside Building for Technology and Design** at Monash University, completed April 2020, is certified: 19,000 m² behind a 50 per cent window-to-wall ratio in argon-filled double glazing, external fins 560 mm deep set both vertically and horizontally, and a tested airtightness of 0.6 air changes per hour at 50 Pa.

∴ two of the three are identified from appearance, the third from measured performance — which is why the label is never the answer on its own.

- **Source:** Manchester Unity Building — Victorian Heritage Database, Heritage Council Victoria, place 728, <https://vhd.heritagecouncil.vic.gov.au/places/728>; and the building’s published history, <https://manchesterunitybuilding.com.au/history/>
- **Source:** Magney House and Marie Short House — Ozetecture, the Glenn Murcutt Architecture Foundation, <https://www.ozetecture.org/magney-house-bingie-point>; and Glenn Murcutt interviewed in *Assemble Papers*, 14 November 2019, <https://assemblepapers.com.au/2019/11/14/glenn-murcutt-touching-the-earth-lightly/>
- **Source:** Woodside Building for Technology and Design — Grimshaw, project sustainability case study, <https://grimshaw.global/sustainability/monash-case-study/>
- **Source:** Passive House — Passive House Institute, Passipedia, “The world’s first Passive House, Darmstadt-Kranichstein, Germany”, https://passipedia.org/examples/residential_buildings/multi-family_buildings/central_europe/the_world_s_first_passive_house_darmstadt-kranichstein_germany; and the standard’s five requirements — very good thermal insulation, highly energy-efficient windows, controlled mechanical ventilation with heat recovery, no thermal bridges, and airtightness — Passive House Institute, “Passive House requirements”, https://passivehouse.com/02_informations/02_passive-house-requirements/02_passive-house-requirements.htm

Worked examples

Example 1 — scaffolded

Explain how the designer of the WEEBILL Pavilion drew inspiration from a historical design tradition without producing a replica. (4 marks)

Working	Comment
The tradition: the 1880s foundry and woolstore buildings of the quarter, whose two defining features are a south-facing sawtooth roof and a wide sliding hoist door. Its logic: the sawtooth exists because glazing that faces away from the sun gives even, glare-free light over a work floor all day; the wide sliding door exists because a workshop must open fully to move material in and out. The translation: WEEBILL carries a two-bay sawtooth over the making benches for exactly that light, and a 3.6 m sliding batten screen opening the making room to the north courtyard — both built in today’s materials, standing-seam steel and spotted gum, with no applied ornament. ∴ the tradition is carried forward because each borrowed feature still does the job it was invented to do. Had the designer instead applied a reproduction parapet and cast-iron lace, the building would only have quoted the tradition’s appearance.	Name the source tradition specifically, and name the features you are going to trace. “Old industrial buildings” is not a tradition; a sawtooth and a sliding door are features you can point to. This is the step that separates inspiration from copying — ask what problem the feature solved. Marks live here. State what the designer actually did. Note the same <i>logic</i>, different <i>material</i> — that is a translation. Close with the distinction stated explicitly, and name the pastiche you avoided. A contrast earns the final mark.

Example 2 — scaffolded

Analyse how **two** contextual factors of the GERYGONE Lane site influenced the design of the WEEBILL Pavilion. (6 marks)

Working	Comment
Factor 1 — climate, the western sun. <i>Reading:</i> the midsummer sun sets about 30° south of west and spends its last two and a quarter hours below 25° above the horizon, striking the site’s Foundry Street boundary; the same boundary carries 68 dB(A) from traffic and a rail corridor 30 m beyond. <i>Implication:</i> a horizontal hood cannot shade a sun that low, and glazing is also the weakest element acoustically. <i>Decision:</i> no glazing on the west; the store, kiln room and WCs stacked along that wall as a buffer; a vertical spotted-gum batten screen 400 mm clear of the brick. <i>Effect:</i> the making room stays cool and quiet in the late afternoon, and the served rooms take the punishment instead. Factor 2 — physical, the fall of the land. <i>Reading:</i> the site falls 1.8 m from RL 42.00 at the reserve to RL 40.20 at the lane, about 1:13. <i>Implication:</i> a single floor level must sit above the lane, which creates an entry step, and the reserve end must be cut down to meet it. <i>Decision:</i> one floor level 600 mm above the lane, a 1:14 ramp 8.4 m long inside the south wall, and the courtyard terraced in three 450 mm steps.	Start with the specific reading, and use the layer name (“climate”). Two problems arriving on the same face is worth noticing — it lets one decision answer both. Implication, then decision, then effect. The vertical screen is the point: the device suits the angle of the sun. Second factor, a different layer. Give the numbers — they are the evidence. The ramp arithmetic is the justification for 8.4 m: 600 mm at 1:14. Note the effect is threefold — access, amenity and waste.

Effect: step-free entry to AS 1428.1, seat-height terraces the community can use, and cut and fill balanced on site so no soil leaves.

∴ both factors changed decisions the designer would otherwise have made differently: without the western readings the cheap move is glass to the street, and without the fall the cheap move is to cut a flat pad. Reading the place first is what produced a different building.

An explicit conclusion that names the counterfactual. This is what “analyse” asks for, rather than description.

Example 3 — unscaffolded

Describe the style of Study A (c. 1890) using design terminology, and explain why its features took the form they did. (5 marks)

Study A is an ornamented masonry frontage of about 1890. Its **form and massing** is a single rectangular block, symmetrical about a central axis. Its **structure and materials** are load-bearing brick with rendered dressings, both left visible. Its **colour and finish** is a two-colour polychrome scheme: dark red brick banded horizontally with cream render. Its **roofline** is not a roof at all but a raised parapet carrying a moulded cornice and a small central pediment, which conceals the roof behind it. **Ornament** is applied and abundant — the cornice, rendered hoods over each opening, and a cast-iron lace frieze. Its **openings** are three arched heads, evenly spaced, tall and narrow in proportion. It **meets the street** by being built hard to the boundary, with a bullnose verandah carried out over the public footpath on cast posts.

Those features took that form for reasons outside the designer’s taste. Load-bearing brick cannot span a wide opening, so the windows are narrow and arched — the arch is what makes brick work above a void. The verandah shaded the shopfront and its goods and sheltered people on the footpath, in a street with no other shade. The ornament became affordable only once cast iron and pressed cement were mass-produced, and it was worth buying because a decorated frontage advertised the owner’s standing to everyone who passed. ∴ the style is a record of the structural, climatic and social conditions of the 1890s, not a set of decorative preferences.

Example 4 — unscaffolded

Evaluate how effectively the SCRUBWREN exhibition fit-out responds to the context of the 1926 woolstore. (6 marks)

The fit-out responds to the woolstore’s context with real skill in three respects and incompletely in two, and on balance it is effective.

Strengths. First, the fit-out treats the **existing fabric** as the thing to be protected. The steel and plywood frames are free-standing, bolted to the floor only, and held 150 mm clear of every wall, so the brick and the hardwood frame read continuously behind the display and nothing is cut into them; the work is also reversible, which is what heritage practice asks for. Second, it answers the shell’s **light** honestly. South-facing sawtooth glazing gives beautiful even daylight but far too much of it for 1890s dyed wool and paper, so translucent blinds temper the whole hall and the 38 light-sensitive items go into two sealed cases held at 50 lux — the conservation limit — while robust objects take the brighter bays. Third, it answers the **access** reading without damaging the building: with a 1.1 m loading dock and only a 4 m heritage forecourt, an external ramp was not possible, so a platform lift was set into the former hoist void, reusing an opening the building already had.

Limitations. The building is single-glazed and uninsulated with no plant of any kind, and the fit-out conditions only the two cases. That is an economical and low-impact decision, but it leaves the other 202 objects in a hall whose temperature and humidity swing with the weather, and paper and textile damage is cumulative. The rail line 8 m away is also unaddressed: nothing in the fit-out deals with vibration or noise, which matters both for fragile objects and for visitors listening to interpretation.

Judgement. The fit-out is most effective where the contextual reading was about **fabric** — what may be touched, cut or lit — and least effective where the reading was about **environment**: air, humidity and vibration. ∴ it is an effective response overall, because the decisions that protect the building and its most vulnerable objects are the ones that could

not be undone later, while the gaps that remain could still be closed by adding local conditioning and isolating the cases from floor vibration.

Practice questions

Scaffolded

Q1. The vocabulary of time: (a) Define a design **style** and a design **tradition**. (2 marks) (b) Explain the difference between a **style** and a **movement**. (2 marks) (c) Using the three style studies, state which is **contemporary** and which are **historical**, and give the reason. (2 marks)

Q2. Reading Style Study B (c. 1935): (a) Describe its **roofline**, its **openings** and its **ornament**. (3 marks) (b) State the technological change that made its ribbon of glazing possible, and explain how. (2 marks) (c) A student writes: “Study B has no style because it has no decoration.” Correct the statement. (1 mark)

Q3. The layers of context: (a) Name **four** of the six layers of context. (2 marks) (b) Classify each of these GERYGONE Lane readings into a layer: the 8 m height limit; the 1890s cottage row opposite; the community garden beds worked between 7 and 10 am. (3 marks) (c) Explain why a response should say which layer it is working in. (2 marks)

Q4. Sun and orientation: (a) State which compass direction gives a building in Australia its high midday sun, and which gives it a low, hot late-afternoon sun. (2 marks) (b) Explain why a horizontal hood is an effective shading device on the north face but not on the west face. (2 marks) (c) Name the shading device suited to the west face and justify your choice in one sentence. (2 marks)

Q5. The four-link chain: (a) State the four links of a complete analysis of a contextual factor, in order. (2 marks) (b) The mature yellow box in the reserve, just beyond the site’s north-west corner, has a 9 m canopy and a tree protection zone 6 m in radius. Complete all four links for this reading. (4 marks)

Q6. Inspiration and pastiche: (a) Define **pastiche**. (1 mark) (b) Give **two** reasons the pastiche column in the figure is poor practice. (2 marks) (c) Describe one situation in which matching the form of nearby historical buildings **is** the correct response, and explain how it differs from pastiche. (3 marks)

Un scaffolded

Questions 7–22 refer to the three style studies, the GERYGONE Lane site analysis, the WEEBILL Pavilion and the SCRUBWREN Woolstore shown in this subtopic, as indicated in each question.

Q7. Describe the style of Study C (2020s) using design terminology, and explain **two** ways in which it differs from Study A. (4 marks)

Q8. Choose **one** feature of Style Study B (c. 1935). Explain its logic, then explain how you would **translate** — not copy — that feature into a contemporary environmental design solution. (4 marks)

Q9. Analyse how the **built and streetscape** context of Gerygone Lane influenced **three** decisions on the WEEBILL Pavilion. (6 marks)

Q10. Analyse how **climate and orientation** influenced the design of WEEBILL’s northern face, referring to the shading geometry. (5 marks)

Q11. Explain how the **regulatory** context influenced the WEEBILL Pavilion, naming **three** specific requirements and the decision each produced. (5 marks)

Q12. Explain how the **community and cultural** context of the site influenced the design of the WEEBILL Pavilion. (4 marks)

Q13. Compare how the WEEBILL Pavilion and the SCRUBWREN Woolstore each respond to the same local industrial tradition. (6 marks)

Q14. The SCRUBWREN shell is single-glazed and uninsulated with no plant of any kind, and a working rail line runs 8 m away. Analyse how these **two** contextual readings should influence the exhibition design, giving at least one decision for each. (5 marks)

- Q15.** Evaluate how well the SCRUBWREN lighting strategy resolves the conflict between two competing contextual demands. (5 marks)
- Q16.** A student writes: “The 1890s cottages in Gerygone Lane are worse designs than the WEEBILL Pavilion, because their rooms are dark and they have no insulation.” Explain why this is not an adequate analysis of a historical style, and rewrite the claim so that it is. (4 marks)
- Q17.** The WEEBILL brief is to be repeated on a hot, humid tropical site in far north Queensland, in a street of raised timber houses on stumps. Explain how **three** contextual readings would change, and give the decision each would now produce. (6 marks)
- Q18.** A developer proposes adding a moulded parapet, a bullnose verandah and cast-aluminium lace to the WEEBILL Pavilion “so that it fits in with the heritage streetscape”. Discuss this proposal. (4 marks)
- Q19.** You are responding to a brief for a **landscape** design project: a 180 m boardwalk, a shelter and a seating terrace in a coastal wetland reserve. Explain how you would draw inspiration from **one** historical style or tradition, and respond to **three** contextual factors, giving one specific decision for each. (6 marks)
- Q20.** Explain the difference between a **style**, a **tradition** and a **contextual factor**, giving one example of each drawn from this subtopic. (4 marks)
- Q21.** Keeping the yellow box canopy over the site’s north-west corner brings both a benefit and a cost. Explain the trade-off the WEEBILL designer accepted, and state which contextual reading was given priority. (4 marks)
- Q22.** Explain how **temporal** context — the hour, the season, and what a place was and is becoming — acts as a contextual factor, using one example from the WEEBILL Pavilion and one from the SCRUBWREN Woolstore. (4 marks)
- Q23.** The **Manchester Unity Building**, Melbourne (Marcus Barlow, completed 1932), is described under “Named styles and movements”. Identify the style it belongs to, justify your identification using **four** of the seven indicators, and explain why “interwar” is not an answer to that question. (6 marks)
- Q24.** You are responding to a brief for an **interior** design project: the fit-out of a 160 m² ground-floor tenancy in a 2005 office building as a community health waiting room and three consulting rooms. The tenancy’s only external wall faces **west**, is fully glazed, and may not be altered. Explain how you would draw inspiration from **one contemporary** design style or tradition named in this subtopic when responding to this brief, stating why your source counts as contemporary, and justify what you **translated** rather than copied. (5 marks)

Answers

Q1. (a) Style = a recognisable set of visual characteristics shared across a body of work, datable and locatable; tradition = a way of designing and making passed down within a community or place, sustained by practice. (b) A movement is a group of designers consciously pursuing shared ideas, usually with a published position; a style is the visual result. (c) Contemporary = Study C (2020s, the present period); historical = Studies A and B (1890s and 1930s, no longer current practice). **Q2.** (a) Roofline = a flat parapet with a thin coping, no visible roof; openings = one continuous horizontal ribbon of steel-framed glazing with slim mullions, plus a glazed entry; ornament = none applied. (b) The steel and reinforced-concrete frame — it carries the load, so the wall no longer has to, and glass can run horizontally. (c) Plainness is itself a style decision; the movement behind Study B held ornament to be dishonest. **Q3.** (a) Any four of: physical/site, climate, built/streetscape, community/cultural, regulatory, temporal. (b) Height limit = regulatory; cottage row = built/streetscape; garden beds worked 7–10 am = community/cultural (accept temporal for the hours if justified). (c) Because the layer tells the reader what kind of pressure it is, and stops the five named factors of 6C being confused with the properties of the place. **Q4.** (a) High midday sun = north; low hot late sun = west. (b) See solutions. (c) Vertical fins, battens, screens or planting — a low sun comes in almost horizontally, so only a vertical device blocks it. **Q5.** (a) Reading → implication → decision → effect. (b) See solutions. **Q6.** (a) Reproducing the surface features of a historical style without the reasoning that produced them. (b) The ornament carries no logic (no craft, no cost reason, no function); and a viewer cannot tell old work from new, which heritage practice requires. (c) A heritage overlay or strong streetscape requiring sympathetic scale, setback, rhythm and datum — matching proportions while remaining legibly new, rather than imitating ornament. **Q7–Q22.** See fully-worked solutions. **Q23.** Art Deco / the interwar commercial Gothic (accept either, and accept both named together, provided the description carries it). Indicators: form and massing = a corner block of strongly vertical proportion, piers unbroken from footpath to skyline; structure and materials = concrete-encased steel frame behind a hung skin of moulded glazed terracotta faience; roofline and skyline = no dominant cornice but an ornamental tower of diminishing buttresses about 24 m above the roof; ornament and detail = applied, stylised and geometric, moulded into the cladding units themselves. “Interwar” is a **period** — a span of dates — not a style. See solutions. **Q24.** Any contemporary source named in this subtopic is acceptable — Passive House and its certified example the Woodside Building (2020), or the 2020s performance-and-policy idiom of Study C, or WEEBILL’s own approach — provided it is dated as current practice, not merely recent. The answer must carry a *logic* rather than a look: name the feature, name the problem it solved, and re-express that logic under the tenancy’s own constraints (a fixed west-facing glazed wall that cannot take external shading). Specifying a Woodside-style fin grid, deep reveals or a “sustainable” material palette inside a leased tenancy is contemporary pastiche and earns nothing. See solutions.

Fully-worked solutions

Q1. (a) A **design style** is a recognisable set of visual characteristics shared across a body of design work — its form, materials, colour, roofline, openings, ornament and proportions — which can usually be dated and located. A **design tradition** is a way of designing and making passed down within a community or a place over time: the knowledge, techniques, materials, motifs and purposes people keep using because they work. (2 marks, one each.) (b) A **movement** is a group of designers consciously pursuing shared ideas in a period, usually with a published position about what design should be; the **style** is the visual result you can see. A style can exist without a movement, but a movement always produces one (2 marks: *the movement defined as a group holding a shared position + the style identified as the visual result*). (c) **Contemporary:** Study C, because the 2020s is the present period. **Historical:** Studies A and B, because the 1890s masonry idiom and the 1930s early-modern idiom are no longer current practice (2 marks: *correct classification + a reason that turns on “of the present time”, not on “old”*).

Q2. (a) **Roofline:** a flat parapet finished with a single thin coping; there is no visible roof and no eaves. **Openings:** one continuous horizontal ribbon of steel-framed glazing divided by slim mullions, with a glazed entry beneath a cantilevered hood; the openings are wide and low in proportion, the opposite of Study A’s tall narrow arches. **Ornament:** none applied — the only relief is three shallow incised horizontal lines and a streamlined corner. (3 marks, one per indicator.) (b) The change is the **steel and reinforced-concrete frame**. Because the frame carries the floor and roof loads, the external wall is no longer structural, so an opening no longer needs an arch or a narrow width to stay up; glass can therefore be run in a continuous horizontal band and the corner can be turned in a curve (2 marks: *technology named + the mechanism that frees the wall*). (c) The statement confuses *ornament* with *style*. Plainness is a positive style decision, not the absence of one: the movement behind Study B held applied ornament to be dishonest, so the smooth rendered surface, the horizontal proportion, the ribbon glazing and the cantilever **are** its style signature.

Q3. (a) Any four of: **physical / site; climate; built / streetscape; community / cultural; regulatory; temporal.** (b) The **8 m height limit** is **regulatory** — it is a control in the planning scheme. The **1890s cottage row opposite** is **built / streetscape** — it is the scale, rhythm and datum of what already stands nearby. The **garden beds worked between 7 and 10 am** is **community / cultural** — it is who uses the place, how and when (*accept temporal for the 7–10 am window if the answer argues the reading is about the hour of use*). (c) Because the layer identifies what kind of pressure is operating, which in turn tells you what kind of decision answers it. It also keeps the properties of the **place** distinct from the five named factors — economic, technological, cultural, environmental and social — which act on the **project** (2 marks: *what naming the layer tells the reader + the distinction it preserves from the five named factors of 6C*).

Q4. (a) The high midday sun comes from the **north**; the low, hot late-afternoon sun comes from the **west**. (b) A horizontal hood shades a window by casting a shadow **downwards**, and how far down it reaches depends on how high the sun is. On the **north** face the sun is high exactly when shade is wanted — about 75.7° at midsummer noon — so a modest 700 mm hood covers 2.7 m of glass; and because the midwinter noon sun is only 28.8° high, the same hood lets sun reach about 4.2 m into the room when it is wanted. On the **west** face the sun arrives late in the day at less than 25° above the horizon, almost horizontally, so a horizontal hood would have to project several metres to intercept it — which is neither buildable nor affordable (2 marks: *the mechanism of a horizontal device + the two sun altitudes that make it work on one face and fail on the other*). (c) **Vertical** devices — fins, a batten screen, a louvre blade set on edge, or a planted buffer. A sun that low arrives nearly parallel to the ground, so only a surface standing **across** its path can block it; WEEBILL uses a vertical spotted-gum batten screen 400 mm clear of the west wall (2 marks: *correct device + justification by sun angle*).

Q5. (a) **1** the reading; **2** the implication; **3** the decision; **4** the effect. (b) *Reading*: a mature yellow box, 12 m tall with a 9 m canopy, stands in the reserve's south-west corner about 1.5 m beyond the site's northern boundary, its canopy overhanging the site's north-west corner, and its tree protection zone extends 6 m in radius. *Implication*: no footings, excavation or paving may go inside that zone, and because the trunk sits outside the site the zone reaches only about 4.4 m in across the north-west corner — well under a tenth of the 432 m², but exactly the corner a courtyard would want — and the canopy will shade whatever sits under it, from the west, in the late afternoon. *Decision*: place the building on the south-east portion of the site, hard to the lane and to the east party wall, and let the north-west stay open as the courtyard and planted verge. *Effect*: the tree survives with its root zone intact; the courtyard gains free afternoon shade in summer; and the building ends up where the site's constraints wanted it anyway — against the blank party wall and away from the tree (4 marks, *one per link*).

Q6. (a) **Pastiche** is the reproduction of the surface features of a historical style — its ornament, mouldings and motifs — without the reasoning, construction or purpose that produced them. (b) Any two of: the ornament carries **no logic** — there is no craft, no structural role, no cost reason and no shade in a bolted-on aluminium “lace”; a viewer **cannot tell what is old from what is new**, which Australian heritage practice specifically asks for; it answers **none of the site's real problems** (it does nothing about the west sun, the noise or the fall); and it dates immediately, because it is a copy of a copy (2 marks). (c) Where a **heritage overlay** or a strong existing streetscape requires new work to be **sympathetic**, matching the neighbours' discipline is correct: WEEBILL holds a 4.5 m street parapet to match the cottages' 4.2 m parapets, hangs its canopy at the same 3.2 m soffit datum, builds to the boundary as they do, and sets the sawtooth back 3 m so it does not break the skyline. The difference from pastiche is what is matched: **scale, setback, rhythm, datum and material family** — the proportions and discipline of the street — while the building remains plainly of 2026. Pastiche instead copies the **ornament** and pretends the new work is old (3 marks: *the situation + at least two matched attributes + the stated distinction*).

Q7. Study C is a contemporary frontage of the 2020s. Its **form and massing** is a low horizontal block; its **roofline** is a two-bay sawtooth whose glazed risers face south; its **materials** are a recycled-brick base course beneath standing-seam steel, with a vertical timber batten screen and an exposed steel column; its **openings** are one tall glazed bay under a projecting hood; and its **ornament** is nil — every surface is left as the material it is.

Two differences from Study A. **First, the roofline and its purpose.** Study A hides its roof behind a parapet with a cornice and pediment, so the skyline exists to be *looked at*. Study C makes the roof the most expressive thing about the building, and it is shaped to *do work* — south-facing glazing to bring even, glare-free light onto a floor. **Second, ornament and the honesty of materials.** Study A applies render hoods, moulded cornices and cast-iron lace over its brick, and paints and finishes its surfaces; Study C leaves salvaged brick, steel and timber unpainted and unadorned, so what you see is the material and the structure. ∴ the two are not merely different in taste: Study A treats a frontage

as a display of standing, and Study C treats it as the visible result of performance and material decisions (4 marks: a description using at least three indicators + two clearly stated differences).

Q8. (Model response, using the ribbon window. Accept the cantilevered hood, the streamlined corner or the deliberate absence of ornament, if the logic is correctly identified.)

The feature. Study B's continuous horizontal **ribbon of steel-framed glazing**, running most of the frontage and divided only by slim mullions.

Its logic. The ribbon is a direct consequence of the steel and reinforced-concrete frame. Once the frame carries the load, the external wall is no longer structural, so glass no longer has to be broken into narrow arched openings to stay up. The designers of the 1930s used that new freedom for a reason beyond display: a long, high, uninterrupted band of glass throws daylight much deeper and much more evenly into a room than the same area of glass in separate punched windows, because there is no dark strip of wall between openings. Before fluorescent lighting, that was how you lit an office or a classroom.

The translation. Copying the feature would mean running an aluminium ribbon across a frontage because it looks 1930s. Translating it means keeping the *even daylight* logic and re-deciding everything else against today's requirements. In a new environmental design solution I would run a continuous glazed band only on the **north** face, where an unbroken horizontal opening can be shaded by an unbroken horizontal hood sized to the summer sun; I would keep the band high and relatively shallow, so the light reaches deep without a wall of glass to overheat; I would use thermally broken frames and double glazing, because a 1935 single-glazed steel ribbon is a thermal disaster by current standards; and on the west face I would not use it at all.

∴ the feature survives as a **daylighting strategy** rather than as a period motif — and the test is that my version has to be justified by the light it delivers, not by the decade it recalls (4 marks: feature named, its logic explained beyond appearance, a specific translated decision, and the copy/translate distinction made explicit).

Q9. The built and streetscape reading is precise: across the 6 m lane stands an 1890s cottage row, single-storey, with 4.2 m parapets, verandah soffits at 3.2 m, built hard to the boundary on a repeating 5 m rhythm, and the lane frontage carries a heritage overlay.

Decision 1 — the street parapet. *Implication:* a new building whose street wall is much taller or much shorter than 4.2 m will read as an intrusion in a consistent single-storey street. *Decision:* the parapet is held at 4.5 m. *Effect:* the new frontage sits within the cottages' datum, so the row still reads as one street.

Decision 2 — the canopy. *Implication:* the street has a continuous sheltered edge at 3.2 m; break that line and the footpath loses both its shelter and its rhythm. *Decision:* a plain steel canopy 2.4 m deep at exactly the 3.2 m soffit datum, with no cast-iron lace. *Effect:* the shelter and the datum line continue, while the canopy remains legibly of 2026.

Decision 3 — the setback of the sawtooth. *Implication:* the sawtooth ridge at 5.4 m is taller than anything in the street and would break the skyline if it stood on the boundary. *Decision:* set it back 3 m behind the parapet. *Effect:* from the opposite footpath the ridge falls below the sight line over the parapet, so the street reads as single-storey while the building still gets its roof light.

∴ the streetscape did not dictate the building's appearance; it dictated three **dimensional** disciplines — a height, a datum and a setback — inside which the designer was free to build in the materials of the present (6 marks: the reading with evidence, three distinct decisions each traced to an implication and an effect, and a conclusion that distinguishes discipline from imitation).

Q10. Reading. The site's northern boundary faces an open reserve, so the sunny side is also the side with the outlook. At this latitude the noon sun stands about **75.7°** above the horizon at midsummer and about **28.8°** at midwinter.

Implication. Northern glazing is the one orientation where a single fixed device can do opposite jobs in the two seasons, because the sun's altitude changes so much: a horizontal hood casts its shadow far down the glass when the sun is high and barely at all when the sun is low.

Decision. The designer glazed the making room's north wall full height, 2.7 m, and fitted a horizontal hood projecting 700 mm at the head of the glass.

Effect. The geometry is deliberate. At midsummer noon the hood's shadow reaches $0.7 \times \tan 75.7^\circ \approx 2.75$ m down the wall, which is more than the 2.7 m of glass — so the glazing is **fully shaded** exactly when the room is at risk of overheating. At midwinter noon the sunlit patch on the floor extends $2.7 / \tan 28.8^\circ - 0.7 \approx 4.2$ m into the room, which is more than half the depth of the space — free heat and light in the coldest month. Nothing moves, and nothing has to be operated by a user.

$\therefore$ climate and orientation together did not merely suggest “put windows on the north”; they set the **dimensions** of the opening and its shade. Had the same 2.7 m of glass been placed on the west wall the identical hood would have achieved almost nothing, because the late sun arrives below 25° (5 marks: the two altitudes, the decision with its dimensions, the summer and winter outcomes quantified, and the orientation-specific conclusion).

Q11. Requirement 1 — the heritage overlay on the lane frontage. New work must be sympathetic in scale, setback and roof form while remaining identifiable as new. *Decision:* the 4.5 m street parapet, the plain canopy at the street's 3.2 m datum, and the sawtooth set back 3 m — matching the street's dimensions, not its ornament.

Requirement 2 — AS 1428.1, the access standard. A ramp may not be steeper than 1:14. *Decision:* the 600 mm rise from the lane to the floor is taken up by a ramp 8.4 m long inside the south wall, which is exactly 1:14 and short enough to run as a single flight.

Requirement 3 — the tree protection zone and the permit required for tree works. No footings or excavation within 6 m of the yellow box. *Decision:* the building and its footings are held clear of that zone, and the north-west corner stays as planted verge at the head of the courtyard.

Two further controls shaped the envelope: the **nil setback** to the lane, which is why the building is built hard to the boundary like its neighbours, and the **8 m height limit**, which the 5.4 m ridge sits comfortably under. $\therefore$ regulation in an environmental project is not paperwork applied after design — the overlay set the frontage, the Standard set the section, and the tree zone kept the north-west corner out of the footprint (5 marks: three requirements, each named specifically and each tied to a decision).

Q12. The community reading is that the reserve to the north already holds 14 garden beds worked mostly between 7 and 10 am, and that the Neighbourhood House stands 40 m east along the lane — so the pavilion is joining a place that people already use, at particular hours, for particular things.

Decision 1 — a building that opens. A 3.6 m sliding batten screen lets the making room and the north courtyard work as one space, so a workshop can spill outside and a gardener can come in without going around to the lane. *Effect:* the two existing activities meet rather than sit side by side.

Decision 2 — the courtyard as a room, not a leftover. The three 450 mm terraces are seat height, in brick, so the space between the building and the beds becomes somewhere to sit, eat and be taught. *Effect:* the pavilion adds public space instead of consuming it.

Decision 3 — protecting what is already there. The building is held on the southern part of the site, hard to the lane, with the courtyard between it and the reserve — and because a building's shadow falls **south**, the pavilion throws its shadow across its own lane frontage rather than north into the reserve. The gardeners' morning sun and the beds themselves are untouched, which is what let the roof carry its full 5.4 m of sawtooth without taking a minute of sun off the people already using the place.

$\therefore$ the cultural reading was not about style; it was about who is already here and when, and it produced decisions about **openings, levels and shadow** (4 marks: the reading with evidence + at least two decisions traced to effects on the existing community).

Q13. Both projects draw on the same tradition — the 1880s–1920s industrial buildings of the foundry quarter, whose signature is a **south-facing sawtooth roof**, exposed structure, brick and wide sliding openings — but they stand in opposite relationships to it.

WEEBILL translates the tradition into new work. There is no historic fabric on the site beyond 4 m of unsound foundry wall. The designer therefore had to decide which features of the tradition to carry forward and why: a two-bay sawtooth, because south light suits a workbench; recycled brick, because the material was already on site; a wide sliding screen, because a making room must open. Everything is built in current materials, and the building is unmistakably of 2026.

SCRUBWREN works inside the tradition's own fabric. Here the sawtooth, the hardwood frame, the brick and the hoist void are not references — they are the building. The designer's decisions are therefore about **restraint**: frames that are free-standing and held 150 mm clear of the walls, fixings into the floor only, a lift set into an opening the building already had, and blinds fitted to the existing glazing rather than the glazing replaced. The new work is reversible and legibly new.

The similarity is the governing principle: in both, a feature of the tradition is respected for **what it does**, not for how it looks. WEEBILL keeps the sawtooth because south light works; SCRUBWREN keeps the sawtooth because it is there and it works, and then tempers it because wool and paper cannot take that much light.

The difference is the direction of the obligation. WEEBILL's designer had to *justify* every borrowing, and the risk to avoid was pastiche. SCRUBWREN's designer had to *avoid damaging* what already existed, and the risk to avoid was loss of fabric. ∴ the same tradition generates opposite disciplines depending on whether you are adding to a place or working within it (6 marks: the tradition identified, both projects treated congruently and in comparable depth, an explicit similarity and an explicit difference, and a conclusion).

Q14. Reading 1 — an uninsulated, single-glazed shell with no plant. *Implication:* the internal temperature and relative humidity will follow the weather closely, and it is the **swing** rather than the average that damages wool, paper and photographic emulsion; conditioning a 640 m² uninsulated hall to museum tolerances would be both unaffordable and, given the energy required, indefensible. *Decisions:* condition **locally** rather than globally — the two sealed cases are individually conditioned, so a stable microclimate is created around the 38 vulnerable items and nowhere else; extend that logic by adding buffered, gasketed vitrines for the remaining paper items rather than sealing the building; site nothing sensitive against the external brick, where the daily swing is largest, or under the glazing, where solar gain is; and instal simple dataloggers so the actual conditions are known rather than assumed. *Effect:* the objects that need stability get it, at a fraction of the cost and energy of conditioning the volume — and the building keeps behaving as the loose, breathing brick shell it was built as.

Reading 2 — a working rail line 8 m away. *Implication:* two separate problems arrive from it. **Vibration** travels through the ground into the footings and up the timber floor, and continuous low-level vibration walks small objects across a shelf, abrades fibres at contact points and loosens fixings. **Airborne noise** makes spoken interpretation, audio and film hard to hear, which for an exhibition is a failure of communication, not merely a nuisance. *Decisions:* set the sealed cases on resilient isolating pads rather than bolting them hard to the deck, and bed loose objects on inert friction matting so they cannot creep; avoid tall, slender, top-heavy mounts near the rail-side wall; place any audio or film content in the bays furthest from that wall, or in an enclosed space, and caption everything so no visitor depends on hearing; and re-check the floor-bolted frames' fixings on a schedule rather than once at installation. *Effect:* the collection stops being slowly abraded by the railway, and the interpretation can actually be received.

∴ these two readings matter precisely because neither is visible in a photograph of the building. A contextual reading is not only what a site looks like — it is what the site *does* to a space, hour after hour (5 marks: both readings with their implications, at least one specific decision each — credit recognition that the rail line creates two distinct problems — and an effect stated).

Q15. The two demands are genuinely opposed. On one side, the shell's **south sawtooth glazing** is the building's greatest asset: even, diffuse, glare-free daylight across the whole hall, free of running cost, and part of what makes the woolstore worth visiting. On the other, **conservation** limits light on sensitive material: 1890s dyed wool samples, tally books and photographs fade cumulatively and irreversibly, and the accepted ceiling for such material is about 50 lux — far below what that roof delivers on a bright day.

What the strategy does well. It separates the collection by sensitivity rather than treating the whole hall as one problem: 38 vulnerable items go into two sealed, conditioned cases held at 50 lux in the darker centre bays, while robust objects — the press, the frames, reproduced photographs — occupy the bright perimeter. It keeps the daylight rather than blacking the building out, because translucent blinds temper the glazing instead of replacing or covering it, so the sawtooth still reads as the sawtooth. And it is **reversible**: blinds and cases can be removed, and no glazing was altered.

Its limitations. Blinds are operated, and an operational control is only as good as the routine behind it; a bright afternoon with the blinds up will still deliver far more than 50 lux to anything outside the cases. There is no measurement or datalogging described, so the strategy is a design intention rather than a verified performance. And a

“robust” object is not an insensitive one — reproduced photographs are safe, but the original press labels and paper tickets on the perimeter are not.

Judgement. The strategy resolves the conflict **well for the material it identified as vulnerable and only partly for the rest**. ∴ it is an effective response because it chose the right principle — protect by zone and by case, not by darkening the whole building — but it is incomplete until light levels in the open bays are measured and the blinds’ operation is tied to a documented routine rather than to judgement (*5 marks: both demands defined, strengths with evidence, limitations with evidence, and a judgement that says which part is resolved*).

Q16. The claim fails for three reasons.

First, it judges a historical style against requirements that did not exist. The cottages have no insulation because no code required any and the material was not available cheaply; they have small windows because a brick wall carried the roof and an opening had to be arched and narrow to stay up, and because glass was expensive. Neither is a failure of design; both are the conditions of 1890.

Second, it ignores what the style achieved under its own conditions. The same cottages give the street a continuous sheltered edge at 3.2 m, a consistent 4.2 m parapet, a workable 5 m rhythm and rooms with high ceilings and cross-ventilation — a set of qualities the WEEBILL designer valued enough to match.

Third, it is not comparing like with like. A row of 1890s dwellings and a 2026 community pavilion have different purposes, briefs, budgets and rules. “Worse design” has no meaning across that gap.

A defensible rewrite: *“The 1890s cottages and the WEEBILL Pavilion are each well resolved for the conditions of their own time. The cottages answered load-bearing brick construction, expensive glass and an unshaded street with narrow arched openings and a deep verandah; WEEBILL answers a modern access standard, a heritage overlay and a known solar geometry with a 1:14 ramp, a matched parapet and a 700 mm hood over its north glazing. What the cottages contribute — datum, rhythm and sheltered footpath — WEEBILL deliberately continues.”* ∴ the analytical task is to reconstruct the conditions each design answered, not to rank them (*4 marks: at least two reasons the claim fails + a rewrite that attributes each design’s features to the conditions of its period*).

Q17. Three readings change, and each changes a decision.

Climate — the sun. In far north Queensland the site is much closer to the equator, so the noon sun is very high for most of the year and can pass slightly **south** of overhead near midsummer; heat, not winter sun, is the whole problem. *Decision:* abandon the north-glazing-plus-hood strategy that suited a temperate site. Shade **every** face with deep eaves and verandahs of 1.8–2.4 m all round, use vertical screens on both east and west, and stop trying to collect solar heat at all — there is no heating season to collect it for.

Climate — humidity, rain and cyclone. Intense wet-season rainfall, high humidity year-round and cyclonic wind loads. *Decision:* replace the sawtooth — whose internal box gutters are its known weakness — with a simple pitched or skillion roof of generous slope, wide overhangs and external gutters; light the benches with tall shaded south openings and clerestories instead. Then design for **air**: openable louvres on opposite walls, high-level vents and a fan-assisted cross-breeze, because in humid heat moving air does the work that thermal mass does in a temperate climate. Specify cyclone-rated fixings, and check the site’s flood level.

Built and streetscape. The street is one of raised timber houses on stumps, not of brick cottages built to the boundary. *Decision:* the pavilion lifts off the ground on stumps or piers, with a set-back, verandah-fronted frontage rather than a nil-setback parapet wall — matching the street’s rhythm of shaded raised platforms. This also earns two other things at once: air moves under the floor, and the building sits above a wet-season ground.

∴ the brief is the same but the place is not, so the building must be different. Note that the *method* does not change — read the place, state the implication, decide, check the effect — only the readings (*6 marks: three distinct readings that genuinely change, each with a specific decision, and the recognition that the process is transferable while the answers are not*).

Q18. The proposal should be **rejected**, although the concern behind it is legitimate.

What is right about it. The heritage overlay does require new work in Gerygone Lane to sit comfortably with an 1890s street. Fitting in is a real obligation, not a developer’s whim.

Why the proposed method is wrong. A moulded parapet, a bullnose verandah and cast-aluminium lace bolted to a steel-framed pavilion is **pastiche**: it reproduces the cottages' ornament while carrying none of the reasoning that produced it. The lace has no craft, no structural role and no shading function; the bullnose profile exists to throw rain clear of a timber-framed verandah the pavilion does not have. It would also make it impossible for a visitor to tell 1890 from 2026 — the opposite of what Australian heritage practice asks, which is that new work be readily identifiable as new. And it would answer none of the site's real problems: the western sun, the traffic noise and the 1.8 m fall are all untouched by a cornice.

What the building already does instead. WEEBILL fits in by matching the street's **dimensions** — a 4.5 m parapet against the cottages' 4.2 m, a canopy at the same 3.2 m soffit datum, a nil setback, and a sawtooth set back 3 m so the skyline is unbroken. That is sympathetic design; the ornament is what should not be copied. ∴ the proposal misidentifies *what* a new building should share with its neighbours: proportion and discipline, not decoration (*4 marks: a judgement, the legitimate concern acknowledged, at least two specific reasons the method fails, and the alternative already present in the design*).

Q19. (Model response. Any defensible tradition and any three layers are acceptable, provided each decision is specific.)

The tradition — the timber jetty and the fishermen's shelter. Coastal Australia has a long tradition of light timber structures standing in water on piles: jetties, boat sheds and open shelters with a simple skillion roof, built from a small number of repeated members, deliberately easy to repair a piece at a time, and left to weather rather than painted. *Its logic*: piles keep a structure above a moving water level and disturb almost nothing beneath; repeated identical members can be replaced one by one by local labour; an unpainted, well-ventilated timber survives salt better than a coated one. *My translation*: the boardwalk runs on driven piles with a repeating 1.8 m module and identical replaceable deck panels, and the shelter is a single skillion of the same module — but in durable hardwood or recycled composite, with stainless fixings and a modern balustrade. I am not building a jetty; I am borrowing the pile, the module and the reparability.

Contextual factor 1 — physical / site (the wetland substrate). *Reading*: soft, waterlogged sediment with a shifting water level, and vegetation that must not be trampled. *Decision*: elevate the entire 180 m boardwalk on piles 600 mm above the highest recorded water level, with the deck 1.8 m wide and no edge kerb where water flows, so nothing is filled, compacted or dammed.

Contextual factor 2 — community / cultural (who comes, and whose place it is). *Reading*: the reserve is used by bird-watchers at dawn, school groups mid-morning and families at weekends; it is also on Country, with a river history that precedes the reserve. *Decision*: place the seating terrace at the one point where the open water is visible without disturbing the roosting edge, size it for a class of 25 with two wheelchair spaces, and develop any interpretation of the place's history **with** the local Traditional Owner corporation under agreed protocols rather than writing it myself.

Contextual factor 3 — climate (sun, salt and wind). *Reading*: full exposure, salt-laden onshore wind, and no shade anywhere along the route. *Decision*: orient the shelter's open side to the north for the outlook and winter sun, carry its skillion out 2.4 m on that side to shade the seating at midday, close its south-west corner against the prevailing salt wind, and specify no mild steel anywhere.

Where the factors conflict I would say so in my annotation: elevating the boardwalk protects the substrate (site) but raises cost and makes every pile a construction access problem (economic and technological — see 6C), and I would resolve it by keeping the elevated structure to the 180 m that crosses wet ground and returning to a gravel path on the dry approach. ∴ used at the ideation stage, the readings generate the decisions rather than describing them afterwards (*6 marks: one tradition with its logic and a genuine translation + three contextual factors, each with a named reading and a specific decision; credit a stated trade-off*).

Q20. A **style** is a set of visual characteristics shared across a body of design work, datable and locatable, and read off the design elements and principles. *Example*: the ornamented masonry style of Study A — polychrome brick, arched openings, a parapet with a moulded cornice, applied cast-iron lace.

A **tradition** is a way of designing and making passed down within a community or place, sustained by practice rather than fashion, and continuing rather than finished. *Example*: the south-facing sawtooth roof of the foundry quarter, still used in WEEBILL in 2026 for the same reason it was used in 1880.

A **contextual factor** is not a visual language at all — it is a property of the place and its circumstances that changes what the designer decides. *Example:* the 1.8 m fall from RL 42.00 to RL 40.20 across the Gerygone Lane site, which produced a floor 600 mm above the lane, a 1:14 ramp 8.4 m long and a courtyard terraced in three steps.

∴ styles and traditions are things a designer **draws on**; contextual factors are things a designer **responds to**. A complete response to an environmental brief does both, and says which is which (*4 marks: three correct definitions + one apt example each, with the “draw on / respond to” distinction made*).

Q21. The benefit. The yellow box’s 9 m canopy overhangs the site’s north-west corner, so it shades the head of the courtyard and the planted verge through the hottest hours of a summer afternoon — exactly the low western sun that no horizontal device can stop. That shade costs nothing, needs no maintenance and works better each decade. The tree is also a mature landscape asset that a new planting could not replace for thirty years, and it belongs to the reserve the pavilion is joining.

The cost. A eucalypt is **evergreen**. The canopy therefore keeps shading the north-west in winter as well, when the courtyard would benefit from every hour of low sun it can get — a deciduous tree in the same position would have given summer shade and winter sun. On top of that, the 6 m tree protection zone reaches about 4.4 m into the site across that same corner, and no footing, excavation or paving may go inside it, so the corner has to stay soft planted verge rather than usable paved courtyard.

The priority. The designer kept the tree, so the **physical / site** reading — an existing mature tree and its root zone — was given priority over the climate reading about winter sun in the courtyard. The decision is defensible: the winter loss is confined to one corner of an outdoor space, whereas the summer gain falls on that same corner in the hours it would otherwise be unusable, and the tree is protected by the planning scheme in any case, so removing it was never freely available. ∴ where two readings conflict, the built result is the record of which one won — and naming the loss is what turns a description into an analysis (*4 marks: benefit with its mechanism, cost with its mechanism, the priority named as a layer, and a justification*).

Q22. Temporal context is the layer that asks **when**: not only the hour and the season, but what the place used to be and what it is turning into. It matters because a space is not experienced once — it is experienced repeatedly, at different times, by people who remember it differently.

WEEBILL — what the place was. The site was a working foundry yard from 1884 to 1978, and 4 m of its brick wall still stood on the west boundary, unsound but with sound brick in it. That reading produced a material decision: the wall was dismantled and its brick re-laid as the courtyard retaining steps and the building’s base course. *Effect:* the new building physically contains the old yard, so the site’s history is present without being illustrated — and no brick was bought or carted. The same layer also runs through the design as *hours*: the garden beds are worked between 7 and 10 am, and the 700 mm hood is sized for the difference between a midsummer noon and a midwinter noon.

SCRUBWREN — what the place is becoming. The shell is a 1926 woolstore whose working life ended, and the fit-out has to accept that another use will follow this one. That reading produced the central decision of the project: every new element is **reversible** — free-standing frames bolted only to the floor, held 150 mm clear of the walls, blinds fitted to existing glazing, and a lift placed in an opening the building already had. *Effect:* the exhibition can be removed without trace, leaving the 1926 fabric available to whatever comes next.

∴ in both projects the temporal reading changed a decision about **material and permanence** rather than about appearance, which is why it is easy to overlook and worth naming (*4 marks: temporal context defined as more than “the season” + one example from each project, each traced from reading to decision to effect*).

Q23. The identification. The Manchester Unity Building belongs to the interwar commercial style named in Australian heritage records as **modern commercial Gothic**, and grouped more widely with **Art Deco** — the vertical, geometric, faience-clad commercial idiom of about 1925 to 1939. Either name is defensible. What has to be defended is the description behind it, so the indicators do the work.

Form and massing. A single block on a prominent street corner, strongly **vertical** in proportion: piers run unbroken from the footpath to the skyline, and the horizontal floor lines are suppressed between them. This is the single strongest piece of evidence, because that verticality is precisely what the style adopted and what the cornice-topped commercial buildings of the 1920s did not.

Structure and materials. Twelve storeys of concrete-encased **steel frame**, clad in moulded, glazed **terracotta faience**. The frame is why the style is possible at all: it carries the load, so the cladding is a thin decorated skin cast in moulds and hung on it. Compare Study A, where the ornamented brick *is* the structure and the openings must therefore stay narrow and arched.

Roofline and skyline. No dominant cornice. The corner is crowned instead by an ornamental tower of diminishing buttresses rising about 24 m above the roof — a skyline that **steps** rather than stops.

Ornament and detail. Applied and abundant, but **stylised and geometric** rather than classical, and moulded into the cladding units themselves, so ornament and cladding are one manufactured product.

Why “interwar” is not an answer. *Interwar* is a **period** — a span of dates between two wars — and a period holds many styles at once, in this case everything from stripped classicism to early Modernism. A style is a set of visual characteristics. Naming the period says only *when* the building was built; the question asks *what it is*, and only the indicators answer that.

∴ the label is a summary of the description, never a substitute for it — which is why an answer that opens “it is Art Deco” and stops has earned nothing yet (6 marks: a defensible style named, four indicators described in design terminology and used as evidence, and the period/style distinction explained).

Q24. (Model response, using Passive House. Accept the 2020s performance-and-policy idiom of Study C or the WEEBILL Pavilion’s own contemporary approach, provided the feature’s logic is identified and the translation is specific to this tenancy.)

The source. Passive House — a contemporary movement in the strict sense, a published performance position rather than a look, first built in 1991 and in current Australian practice, whose certified example in this subtopic is Grimshaw’s Woodside Building for Technology and Design at Monash University, completed April 2020. Everything the movement asks for is measured rather than seen: a window-to-wall ratio held to 50 per cent, external fins 560 mm deep, an airtightness of 0.6 air changes per hour at 50 Pa, insulation carried through junctions without thermal bridges, and controlled mechanical ventilation with heat recovery.

The feature and its logic. The feature I draw on is the **airtight envelope with deliberate ventilation**. Its logic is that uncontrolled air leakage moves more heat than insulation saves, so the standard seals the envelope — and, having sealed it, must then supply fresh air on purpose through a heat exchanger rather than relying on gaps and on someone opening a window. Sealing without ventilating is a health failure; ventilating without sealing is an energy failure. In this movement they are a single decision, and that is what makes the pairing worth borrowing.

What cannot be translated, and why. I cannot transcribe the Woodside envelope, because I do not own one. The west wall is fixed, fully glazed and outside my scope, and I may not hang 560 mm fins off a leased façade. Even if I could, horizontal fins are the wrong device for a west sun that spends the last two and a quarter hours of a summer afternoon below 25° above the horizon. Internal blinds are not a substitute for external shading either: they stop the glare, but the radiation is already through the glass and inside the space. Saying so is the analysis, not a concession.

The translation. *Decision 1 — seal the boundary I do control.* Draught-seal the tenancy line: the entry, the ceiling void above the party walls and every service penetration, with a blower-door test of the tenancy specified so that the result is a number rather than an intention. *Decision 2 — ventilate on purpose.* Because the suite is now tight, and because three small enclosed consulting rooms are occupied back to back all day, mechanical ventilation with heat recovery serves them at a rate set per room, ducted and balanced, instead of a door left ajar. *Decision 3 — zone the plan by exposure.* The west glazing is the hottest and most glaring part of the tenancy from mid-afternoon, so the waiting seating does not go there: the waiting room takes the deeper, cooler part of the plan, the west zone becomes circulation and a planted buffer with vertical fabric louvres as its shading device, and the consulting rooms — which need acoustic privacy and a stable temperature far more than they need a view — sit against the internal walls.

What I translated rather than copied. None of the appearance transferred. What transferred is one rule of reasoning — *control heat and air at the boundary you actually control, then ventilate deliberately* — and one habit, which is to state a performance target and test it. Specifying deep reveals, a fin rhythm and a “sustainable” material palette inside a leased tenancy would have been the contemporary form of **pastiche**: the appearance of performance, verified by nothing. ∴ that the source is current rather than historical changes nothing about the discipline — I still had to name the feature, name the problem it solved, and re-express that logic under my own constraints (5 marks: a contemporary

source named and dated as current practice, its feature's logic explained as performance rather than appearance, at least two specific translated decisions suited to this tenancy, what was rejected and why, and the pastiche distinction made explicit).

Chapter 6 Design, place and time — 6C Factors impacting environmental design projects

Theory

Environmental design is the design of *places* — the spaces people live, work, learn and play in. The Study Design points you at four fields: **architecture, interior design, landscape architecture** and **exhibition design**. The design problem in this Area of Study is not an object you can pick up and carry home. It is a piece of ground, a room, a garden or a gallery, with a fixed location, a public who will use it and a life measured in decades.

This subtopic covers two pieces of key knowledge, and they belong together:

- the **economic, technological, cultural, environmental** and **social** factors that impact environmental design projects; and
- the **features and functions of the design elements and principles** relevant to environmental design.

The factors are *why* a designer chose. The elements and principles are *what* they chose with. An answer that names a factor but cannot point to an element or principle it changed has stopped halfway.

The same five words — a different kind of thing to design. In 4A you met these five factors as influences on design in general, using three-dimensional objects. The words are identical, and you must still use them exactly: *economic, technological, cultural, environmental, social*. What changes is what they act on, and four differences drive everything in this subtopic.

- The site is given and cannot be moved.** A designer can change a container's shape until it suits the freight; nobody can turn a site to face north. Orientation, slope, soil, flooding, wind, noise, existing trees and neighbours are all fixed conditions the design must answer.
- The public did not choose it.** A shopper who dislikes a carton buys another brand. A person who finds a park entrance unsafe after dark simply stops going. Environmental design therefore carries a duty toward people who never selected it, which is why accessibility, safety and inclusion sit at the centre of the social factor.
- It lasts a long time.** A pavilion is expected to serve fifty years or more, so a designer must answer conditions that have not happened yet — hotter summers, a changed population, a use nobody planned for. This is why the economic factor in environmental design is never just the build cost.
- It is built once, by many hands, under regulation.** There is no prototype, no second production run. Planning schemes, the National Construction Code, Australian Standards and heritage overlays set hard limits before the first line is drawn.

THE FIVE FACTORS THAT IMPACT AN ENVIRONMENTAL DESIGN PROJECT



Same five words — but here they act on a *PLACE*: a site that cannot be moved, a public who never chose to be there, and a life of fifty years or more.

Every factor acts on the *DESIGNER*: It changes a decision about where the place goes, what it is made of, and how it is used.

Fields: architecture · interior design · landscape architecture · exhibition design

Economic factors in an environmental project are the money and the market around the *place*: the **capital cost** to build it, the **operating and maintenance cost** of keeping it for its whole life, where the funding comes from (a council budget, a government grant, a developer, a philanthropic gift), the value and cost of the land, how the work is procured and staged, and how much floor area or site area the budget will buy. A very common economic decision in this field is **staging** — building part of the project now and the rest when it is funded. Another is **buildability**: a design that a local contractor can build with ordinary plant is cheaper than one that needs a specialist.

Technological factors are the structural systems, materials, components, services and processes actually available to the designer, and the way the site can be built on: how far a beam can span, what can be **prefabricated** off site and craned in, whether a concrete truck can reach the work, what heating, cooling, lighting, water and data systems exist, and what digital modelling can be done before construction. As in 4A, “technological” does not mean “digital”: a screw pile, a glue-laminated timber portal, a secondary-glazing frame and an acoustic baffle are all technological factors. So is the *absence* of a technology — a hall built in 1908 has no wall cavity, and that fact rules out the conventional way of insulating it.

Cultural factors are the beliefs, traditions, histories and shared practices attached to a place and its people. In environmental design these arrive in three ways that objects rarely face:

- **Country.** Every site in Australia is on the Country of Aboriginal or Torres Strait Islander peoples. Engaging the Traditional Owners of a place, and following the cultural-heritage process that applies to it, is part of designing there. (The protocols themselves are the work of 8B.)
- **Heritage and memory.** Existing fabric — a façade, a hall, a stand of trees — often carries a community’s memory, and may carry a legal **heritage overlay** as well.
- **How a community actually gathers.** How people cook, eat, celebrate, mourn, worship and sit together decides what a place has to provide. A community that eats outdoors in large family groups needs a different pavilion from one that picnics in pairs.

Environmental factors carry the **two senses** you met in 4A, and here the word does double duty because the whole field is called “environmental design”. Say which sense you mean.

- The **site** the place must sit in: orientation and sun angle, climate, prevailing wind, rainfall and flooding, soil, existing vegetation and habitat, noise, and the views in and out.
- The **impact** the place has: the embodied carbon of its materials, the energy and water it consumes in use, stormwater leaving the site, habitat gained or lost, urban heat, and what becomes of the fabric at end of life.

Social factors are the people who will use the place and how they live: age profile, mobility and accessibility, household patterns, safety and **passive surveillance** (whether people can be seen and can see out), use after dark, equity of access, and what a community actually does rather than what a brief assumes it does.

Where do the rules fit? Planning schemes, the National Construction Code, Australian Standards and heritage overlays are the legal machinery through which factors reach the designer — an accessibility standard is how a social factor becomes a requirement, a heritage overlay is how a cultural factor becomes one. Name one of the five factors as your heading, then bring the regulation in as the evidence.

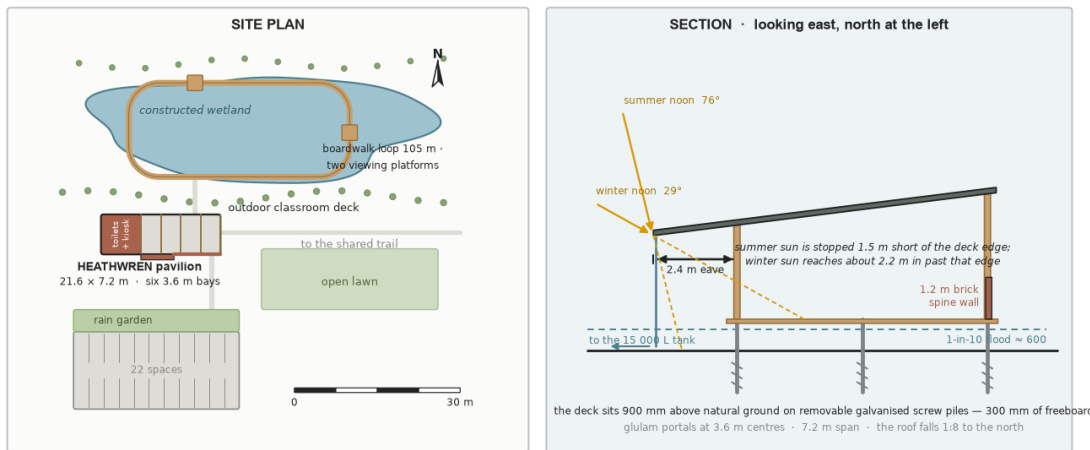
Every factor acts on the DESIGNER. This rule does not change. A factor is not a description of the finished place and not a description of how visitors feel about it — it is a pressure that made the designer choose differently than they otherwise would have. If you cannot finish the sentence “because of this, the designer decided to ...”, you have not yet identified a factor. The four links are the same as in 4A: **the factor → the specific driver → the design decision → the outcome.**

Places record their factors at three scales. A useful habit when you analyse a place is to look for each factor at three different sizes, because a strong project answers a factor at all three and a weak one answers it only at the largest.

- **Site scale** — where things are put: what faces which way, what is near what, where you enter.
- **Space scale** — the size, height, enclosure and materials of the rooms and outdoor rooms.
- **Detail scale** — the junctions, fixings, seats, handrails, signs and surfaces you actually touch.

An environmental factor that produces only a rainwater tank is being answered at one scale. One that also lifts a deck above a flood level, deepens an eave against the summer sun and stops a car park draining into a wetland is being answered at all three.

A first project. HEATHWREN Wetland Pavilion, Boardwalk and Outdoor Classroom is an original design example: a council project on a rehabilitated drainage reserve at the edge of an outer-suburban growth area, opened in 2026 with a capital budget of A\$1.9 million.



an original ClassBasics environmental design example · a council reserve in an outer-suburban growth area · architecture + landscape architecture

FACTOR	THE DRIVER ON THIS SITE	THE DECISION IT PRODUCED
economic	A\$1.9 m capital budget — a council reserve fund plus a growth-areas grant — and an asset team that costed fifty years of maintenance before the project could be approved	a Colorbond roof and hardwood decking instead of coated steel and softwood; the boardwalk loop deferred to a funded stage 2; a leased kiosk shutter whose rent returns toward the cost of upkeep
technological	the reserve is trafficable for only a 14-week window before winter flooding, and no concrete truck can reach the pavilion platform	seven glulam portals CNC-cut off site and craned in over four days; galvanised screw piles instead of a poured slab; a daylight model used to size the 2.4 m eave
cultural	the reserve is on Country; and the growth-area community cooks and eats outdoors in large extended-family groups	a planting palette of local heathland species, named in language alongside English with the Traditional Owners' permission; two 10-seat tables and a covered BBQ bay rather than many small settings
environmental	SETTING: floods 600 mm in a one-in-ten-year event; hot north-westerly summer wind; the site is at latitude 38°S. IMPACT: car-park run-off drains toward the water	the deck 900 mm up on removable screw piles; a 2.4 m north eave and a closed west end; a rain garden between the car park and the wetland; a 15 000 L tank — and no lighting at all over the water
social	a median age of 31 — prams, a school using the outdoor classroom, older residents, and teenagers who use the reserve after dark	a continuous 1.8 m path at 1:20; seats with armrests every 60 m; planting kept below 600 mm along the main path for clear sightlines; only the car-park path is lit, and the boardwalk gate closes at dusk

Read the table under the drawings as chains, not labels. The **economic** driver is that A\$1.9 million had to buy a shelter, a toilet block, a car park, a path network and a boardwalk on a difficult site, and that the council's asset team costs fifty years of maintenance before it will approve anything. So the designer specified a Colorbond roof and hardwood decking rather than the cheaper coated steel and softwood, because the cheaper options are repainted or replaced twice inside that fifty years; deferred the 105 m boardwalk loop to a separately funded stage 2 so that the pavilion could open on time; and added a shutter to the service core that is leased to a community group at weekends, so a small rent returns toward upkeep. The outcome is a project that fitted the grant and does not hand the council a maintenance bill it cannot pay.

The **technological** driver is access and time: the reserve is only trafficable for about fourteen weeks before winter flooding, and no concrete truck can reach the pavilion platform. So the designer used **seven glue-laminated timber portal frames** at 3.6 m centres, cut off site from a digital model and craned into place over four days, and **galvanised screw piles** instead of a poured slab — piles that are wound into the ground by a small machine, need no curing time, disturb almost no soil and can be wound back out again. A daylight model was used to set the depth of the north eave. The outcome is a building that could be erected inside the dry window, and a structure that can be removed if the reserve is ever re-planned.

The **cultural** driver has two parts. The reserve is on Country, so the council engaged the Traditional Owner corporation through the cultural-heritage process that applies to the site; the planting palette is entirely local heathland species, and the interpretive panels name plants in language alongside English, with the Traditional Owners' permission and with the content remaining theirs. The second part is how this particular community eats: large extended-family groups, cooking outdoors. So the designer provided two 10-seat tables and a covered barbecue bay in the brick spine wall rather than six small settings, and kept a flat, uncluttered lawn beside the pavilion for gatherings that outgrow it.

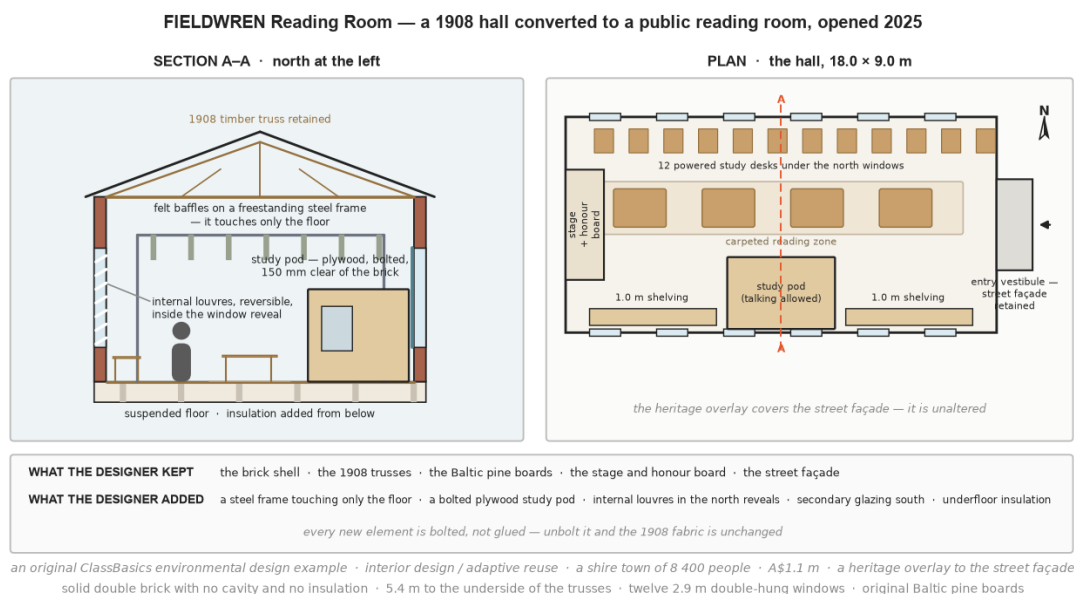
The **environmental** driver operates in both senses at once. In the **site** sense the reserve floods to about 600 mm in a one-in-ten-year event, the summer wind is a hot north-westerly, and the sun at this latitude stands about 76° above the horizon at midday in December and about 29° in June. So the deck sits 900 mm above natural ground — 300 mm of freeboard above the flood; the roof falls to the north and cantilevers a 2.4 m eave, which stops the December sun 1.5 m short of the deck edge while letting the June sun reach about 2.2 m in past that same edge; and the west end is closed by the brick service core against the low afternoon sun and the worst of the north-westerly. In the **impact** sense, the car park drains into a rain garden that filters run-off before it reaches the water, the roof feeds a 15 000 L

tank that flushes the toilets, the screw piles avoid a large concrete pour, and there is no lighting at all over the wetland, so nocturnal wildlife is not disturbed.

The **social** driver is the population: a median age of 31, so prams and small children everywhere; a primary school that books the outdoor classroom deck; older residents who walk the loop; and teenagers who use the reserve after dark. So every path is a continuous 1.8 m wide at a grade no steeper than 1:20, wide enough for two prams to pass and usable by a wheelchair without a ramp; seats with backrests and armrests appear every 60 m; and planting along the main path is kept below 600 mm so that sightlines stay open and people can see and be seen.

Factors conflict — and the finished place records which one won. Lighting the HEATHWREN boardwalk is the clearest example. The **social** factor argues for lighting it: a lit loop is a loop that women, older people and school students will use on a winter evening. The **environmental** factor argues against: light over water disturbs bats, frogs and insects, which is much of the reason the wetland was built. The design gives the two factors different territory — the car-park path is lit with warm, downward-shielded luminaires, and the boardwalk is left dark and gated at dusk. The environmental factor won on the water and the social factor won on the path, and the cost of that decision is real: for about four months of the year the best part of the reserve is unavailable after five o'clock. Naming that trade-off, and what it cost, is what separates an analysis from a list.

A second project — the same five factors, entirely different drivers. FIELDWREN Reading Room is an original design example in a different field: the interior design and adaptive reuse of a 1908 former mechanics' institute hall in a shire town of 8 400 people, converted into a public reading room and study space and opened in 2025 for A\$1.1 million.

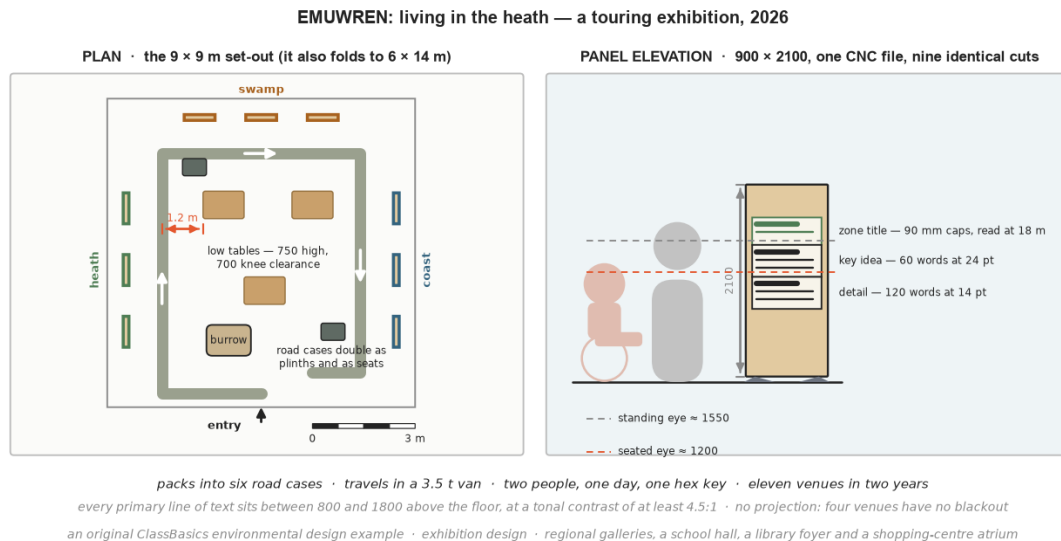


Here the **cultural** factor is doing most of the work. The hall is the town's oldest civic building, a heritage overlay covers its street façade, and the community's memory of the room — its height, its tall windows, the honour board, the stage — is part of what the shire is paying to keep. The designer answered this with a conservation principle: **new work is reversible and legibly new**. A freestanding steel frame carries the acoustic baffles and the services and touches only the floor, never the brick; a plywood study pod stands 150 mm clear of the wall and is bolted, not glued; the internal louvres sit inside the window reveals so the façade is unchanged from the street. Unbolt every new element and the 1908 fabric is exactly as it was.

The **technological** factor is what a 1908 building will and will not accept. Solid double brick has no cavity, so the walls cannot be insulated without either losing the brick inside or changing the façade outside; the trusses were sized for a roof, not for new services. So the designer insulated what could be insulated — the suspended floor, from below — and otherwise built a warmer, quieter *room inside the room* rather than upgrading the shell. The **environmental** factor pushes in both senses: in the site sense the town frosts to about -2°C in winter and reaches 38°C in summer, and the heavy uninsulated brick is an asset in one and a liability in the other; in the impact sense, keeping about 85% of an existing structure avoids the embodied carbon of a new building outright, which is the single largest environmental decision in the project and was made before a line was drawn.

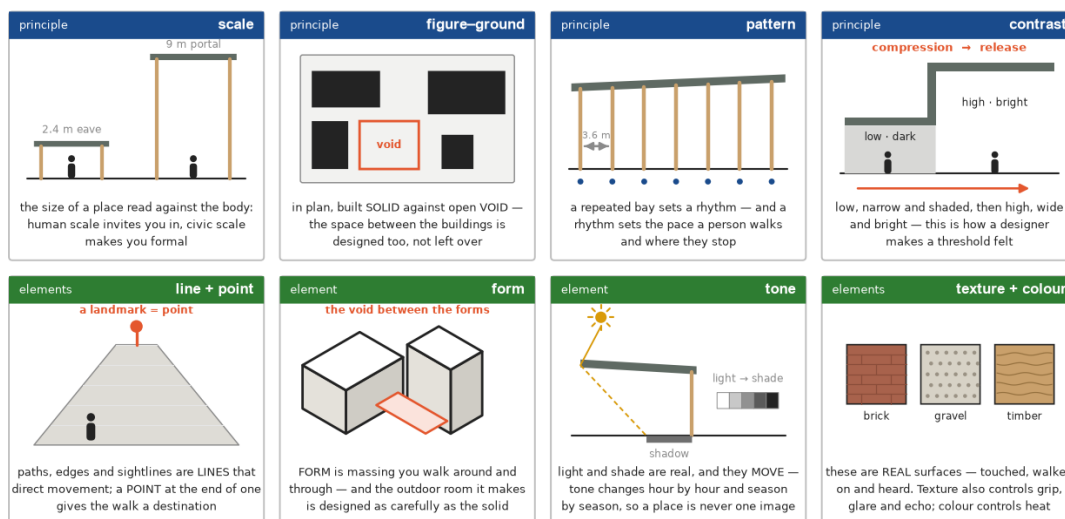
The **economic** factor arrives partly as a condition attached to money: the state library grant required the room to be open sixty hours a week, which a shire cannot staff, so the project had to include after-hours self-service access. The budget also could not do everything, and the **social** factor decided what it did first — a town with a median age of 47, a large teenage cohort with nowhere to go after school, and many households without home internet, needed twelve powered study desks and public wi-fi more than it needed a landscaped courtyard.

A third project — a place with no site of its own. **EMUWREN: living in the heath** is an original design example in exhibition design: a touring exhibition about heathland ecology, commissioned by a regional gallery network for a total budget of A\$180 000 and shown at eleven venues over two years — regional galleries, a school hall, a shire library foyer and a shopping-centre atrium.



EMUWREN inverts the first rule of this subtopic: its site is not fixed, it is *unknown*. Ceiling heights range from 2.7 m to 6 m, one venue has a skylit atrium at 900 lux and another a school hall with a bouncing timber floor, and the designer controls none of it. So the exhibition **carries its own room**: nine identical plywood panels cut from a single CNC file, a printed felt runner that defines the route on any floor, self-levelling feet, and battery-powered LED task lights. The **technological** driver is blunt — four venues cannot black out and two have no spare power circuit — so there is no projection at all, and the interpretation had to be carried by print, objects and light instead. The **economic** driver is equally blunt: a A\$3 200 touring fee per venue pays for two people, one day and one hex key, so nothing may be custom-built for a venue, every panel is identical, and the road cases double as plinths and as seats. The **environmental** driver acts on impact rather than site: plantation-certified plywood, water-based inks, and panels designed to be **re-skinned** for the next tour rather than rebuilt. The **cultural** driver is that eleven different communities have eleven different relationships to the heath, so one panel in each venue is left blank for local content, and Traditional Owner groups are invited to contribute at each stop, with their material remaining theirs and travelling no further than that venue.

The design elements and principles relevant to environmental design. The vocabulary is the one you learned in 2C — the same eight **elements** (point, line, shape, form, tone, texture, colour, type) and the same **principles** (figure–ground, balance, contrast, cropping, hierarchy, scale, proportion, pattern). What changes is that they now work in three dimensions, in real materials, and **over time**. A poster is seen all at once. A place is approached, entered, moved through, sat in, and returned to at another hour and in another season. So the *function* of an element or principle in environmental design is always **behavioural**: it changes where people go, how fast they move, how long they stay, and whether they feel safe.



FEATURES = what the element or principle is. FUNCTIONS = what it does to the people in the space: where they go, how fast they move, how long they stay, whether they feel safe.

A poster is seen all at once. A place is approached, entered, moved through and revisited — so analyse the EXPERIENCE, not the view.

The elements — features and functions.

- **Point** — a single located marker: a landmark tree, a lit sign, a sculpture, a bollard. It gives a route a destination and a place an orientation cue.
- **Line** — real edges and implied ones: a path, a handrail, a roof edge, a row of columns, a sightline. Line directs movement and marks boundaries. A long horizontal roof edge calms a composition; a diagonal path across a lawn is the line people will actually walk.
- **Shape** — the two-dimensional figure you see in **plan**: the footprint of a building, the outline of a paved area or a water body. Shape organises the plan and shows how a space is entered.
- **Form** — the three-dimensional **massing** you experience on site: the solid, and the **void** it makes around and between. In environmental design the void is designed as carefully as the solid — the courtyard between two buildings is a room.
- **Tone** — light and shade, and they are **real and moving**. A deep eave puts a deck in shade all summer; a north window fills a hall at ten in the morning and not at four. Tone models form, marks an entry, and is often the actual reason people choose one seat over another.
- **Texture** — genuine surfaces: brick, timber, gravel, grass, steel, concrete. Texture is touched and walked on, and it does practical work — grip when wet, glare in the sun, echo in a hard room, and resistance to wear.
- **Colour** — for wayfinding and identity, and for physics: a light roof reflects heat, a dark pavement stores it. In a landscape setting a recessive colour lets the planting be the colour.
- **Type** — signage and wayfinding, where legibility at distance is the whole job: cap height set against viewing distance, high tonal contrast, and mounting height chosen so a seated user and a standing user can both read it.

The principles — features and functions.

- **Scale** — the size of the place measured against the **human body** first. *Human scale* is the key idea: a 2.4 m eave edge shelters, a 9 m portal ennobles. Scale tells a visitor whether a place is intimate or ceremonial and how many people it is for.
- **Proportion** — the relationship between the parts: room width to height, window to wall, path width to tree height. A 1.2 m path between 4 m walls feels like a corridor; the same path in the open feels generous. Proportion is what makes a space feel resolved or uncomfortable.
- **Balance** — **symmetry** about an axis reads formal, civic and permanent; **asymmetry** reads informal and relaxed; **radial** balance centres a space. Balance sets the register of a place before a visitor reads a single word.

- **Contrast** — light and dark, high and low, tight and open, rough and smooth. The great contrast device in environmental design is **compression and release**: a low, narrow, shaded threshold opening into a high, bright space. It is how arrival is made memorable.
- **Hierarchy** — the ranking of routes and spaces as primary, secondary and tertiary, so a first-time visitor finds the entrance without asking. In a place the hierarchy is walked, not read.
- **Pattern (repetition and alternation)** — the rhythm of structure and planting: columns at 3.6 m centres, bays, paving modules, trees at spacing. Repetition unifies a long building and sets the pace at which a person walks it; alternation stops that rhythm becoming monotonous.
- **Figure-ground** — in plan, built **solid** against open **void**. Reading solid and void is how a designer decides where the outdoor rooms are, and it is the fastest way to see whether the open space in a project was designed or merely left over.
- **Cropping** — an aperture (a window, a gap between buildings, a gate, the space under an eave) crops the landscape into a framed view. Cropping directs attention outward and ties an interior to its setting.

Reading them in one place. Stand on the HEATHWREN deck. The **form** is a single long low mass under one plane of roof, and the **void** is the open deck between that roof and the water. The **scale** is domestic, not civic — the eave edge is about 2.4 m above the deck, a little over head height, so the roof shelters rather than impresses. Seven frames at 3.6 m centres give a **pattern**, and because each open bay holds one setting — a table, the barbecue bay or the classroom deck — the rhythm turns the shelter into a row of small rooms. The composition is **asymmetrically balanced** — a heavy closed brick core at the west against four light open bays — which reads as a park building rather than a civic one. Moving in from the car park, the path is narrow and in full sun and then the deep eave takes you into shade and shortens the sky: **contrast**, as compression and release. Under that eave the roof edge and the columns **crop** the wetland into a framed horizontal view. The **tone** under the eave is the reason anybody stops. And in plan the whole project is a **figure-ground** exercise: the pavilion, car park and boardwalk are the solids, and the water, the lawn and the heath are the void — which in this project is the point.

When you write this in an annotation, name the element or principle, state its **feature**, then state its **function** in behavioural terms: *“repetition — seven frames at 3.6 m centres — so the shelter reads as six small rooms and a family can occupy one bay without taking the whole pavilion.”*

Units 3 & 4 preview — beyond the Units 1&2 study design. The five factors return in Units 3 & 4 for tasks this course does not set you. In Unit 3, Area of Study 1 you explain how economic, technological, cultural, environmental and social factors influence **design practices** — how designers in a field work, collaborate, are paid and are regulated — rather than the places they make. In Unit 3, Area of Study 2 you identify those factors in an **unseen design example** supplied in the examination Resource Book, working against the clock. Two **methods** are also tagged here and are not required by anything in this subtopic: **post-occupancy evaluation**, in which a designer returns to a completed building a year or more after people have moved in and measures energy, comfort and use against the brief; and **sizing a shading device by calculating solar altitude** — the sun angles for the HEATHWREN site are given to you as site information, and no question here asks you to calculate an angle or to size an eave.

Watch-out — use the five exact terms. *Economic, technological, cultural, environmental, social.* “Money”, “green”, “practical” and “people” factors are not on the list and are not marked as though they were.

Watch-out — the factor must impact the DESIGNER. “Environmental factors impacted HEATHWREN because it is next to a wetland” describes the site, not a decision. State what the designer decided *because* of the factor: the deck went up 900 mm, the eave went out 2.4 m, the lights came off the water.

Watch-out — “environmental” has two senses, and in this field the word is doubly loaded. It means the **site** the place must sit in *and* the **impact** the place has. “Environmental design” is the field; an “environmental factor” is one of five pressures. Say which sense you are using; on a question of four marks or more, both are usually worth covering.

Watch-out — cultural is not social. **Cultural** = shared beliefs, traditions, histories, heritage, Country and community practices. **Social** = how people live and function: age, mobility, safety, household patterns, who is included. The test: does the driver come from what a community *believes, remembers and practises* (cultural), or from how people *live and get around* (social)?

Watch-out — “technological” is not “digital”. A screw pile, a glulam portal, a secondary-glazing frame and a folding steel foot are technological factors. So is the absence of a technology: a 1908 wall has no cavity, and that single fact reshaped the whole FIELDWREN interior.

Watch-out — scale is not proportion. **Scale** compares the place to something outside it, usually the human body. **Proportion** compares the parts of the place to one another. “The eave is a little above head height” is scale; “the shelter is 7.2 m deep and about 3.5 m high” is proportion.

Watch-out — shape is two-dimensional, form is three-dimensional. The footprint you see on a plan is a **shape**. The massing you walk around on site is a **form**. Do not use them interchangeably.

Watch-out — do not analyse a place as though it were a poster. A place is entered, walked through, occupied and revisited in another season. If your analysis of a building would work equally well for a photograph of it, you have described a view rather than a place.

Watch-out — analyse, do not list. Five factors named in five sentences earns less than two factors traced from driver to decision to outcome. Where two factors conflict, say which one won and what that cost — that is where the highest marks live.

Worked examples

Example 1 — scaffolded

Analyse how **economic** factors and **technological** factors impacted two design decisions on the HEATHWREN Wetland Pavilion. (5 marks)

Working	Comment
Economic — the driver: A\$1.9 million had to buy a shelter, a toilet block, a car park, a path network and a boardwalk on a flood-prone site, and the council’s asset team costs fifty years of maintenance before it will approve a material.	Start with the SPECIFIC driver, not the heading. In environmental design the economic driver is almost always capital cost <i>and</i> whole-of-life cost — naming both is what lifts this above “it had a budget”.
The decision: the 105 m boardwalk loop was deferred to a separately funded stage 2, and the materials that stayed were the durable ones — a Colorbond roof and hardwood decking rather than cheaper coated steel and softwood.	Two decisions from one driver, both of them about the <i>place</i>: what gets built now, and what it is made of. Staging is a decision students rarely name and markers like to see.
The outcome: the pavilion opened on time inside the grant, and the surfaces that would otherwise have been repainted or replaced twice in fifty years will not be — so the council was not handed an upkeep bill it could not pay.	Close the chain with the consequence for the client and the place, not just for the drawing.
Technological — the driver: the reserve is trafficable for only about fourteen weeks before winter flooding, and no concrete truck can reach the pavilion platform.	The technological driver here is <i>site access and available process</i>, which is exactly the environmental-design version of this factor.
The decision and outcome: seven glue-laminated portal frames were cut off site from a digital model and craned in over four days, and the structure sits on galvanised screw piles rather than a poured slab. ∴ the building could be erected inside the dry window without concrete on site, and — because a screw pile winds back out — the whole pavilion can be removed if the reserve is ever re-planned.	Both decisions follow from one driver, and the ∴ statement gives the outcome at two scales: it got built, and it can be undone. Note that each factor has been given its OWN decision, as “two design decisions” requires.

Example 2 — scaffolded

Explain the **features** and **functions** of one design **element** and one design **principle** used in the HEATHWREN pavilion. (4 marks)

Working	Comment
Element — form. <i>Feature:</i> the pavilion is a single long low mass, 21.6 m by 7.2 m, under one plane of roof, with a solid recycled-brick core at the west end and four open bays to the east. <i>Function:</i> the form encloses without shutting in. The roof and the brick core make an outdoor room, so the deck is usable in rain and in a hot north-westerly, while the open bays keep the wetland in view and let a breeze through.	“Features and functions” is the exact wording of the key knowledge, so answer in two explicit halves. The feature is what it IS — describable, measurable. The function is what the form DOES to the people in it. Behavioural language — “usable in rain”, “keeps the view” — is what earns the mark.
Principle — scale. <i>Feature:</i> the eave edge sits about 2.4 m above the deck and the roof rises only to 3.6 m above the deck at the back; a standing adult reads the eave at a little above head height. <i>Function:</i> that is human scale, so the pavilion shelters rather than impresses. ∴ a small family group feels entitled to occupy one bay of a public building, which is precisely what a park shelter needs — a 9 m civic portal in the same position would have made the same group feel like visitors.	Scale is measured against the body. Giving the number and then the body comparison is the complete answer. Name the term, then explain the behaviour it produces. The counter-example (what a different scale would have done) shows the marker you understand the mechanism rather than the label.

Example 3 — unscaffolded

Analyse how **cultural** factors and **social** factors impacted the *FIELDWREN* Reading Room. (5 marks)

The two factors acted on different parts of the *FIELDWREN* project, and separating them is the analysis.

The **cultural** driver is that the 1908 hall is the town’s oldest civic building: a heritage overlay covers its street façade, and the community’s memory of the room — its height, its tall windows, the honour board and the stage — is part of what the shire is paying to preserve. The designer answered this with a conservation principle rather than a style: **every new element is reversible and legibly new**. The acoustic baffles and services hang from a freestanding steel frame that touches only the floor; the plywood study pod stands 150 mm clear of the brick and is bolted, not glued; and the new louvres sit inside the window reveals, so nothing changes when the building is seen from the street. The outcome is that the room can be adapted again, or returned to what it was, without damaging the fabric the community values.

The **social** driver is who lives in the town: a median age of 47, a large cohort of teenagers with nowhere to go after school, and many households without internet at home. The designer answered this by spending the budget on twelve powered study desks with public wi-fi rather than on the planned courtyard, by adding an enclosed study pod where talking is allowed so that group work and quiet reading can share one room, and by carpeting the reading zone and hanging felt baffles in a hall that was built hard and reverberant for public speaking. The outcome is a single room that works for a school student at four o’clock and a retired reader at eleven in the morning.

∴ the cultural factor governed **how the old fabric was treated** and the social factor governed **what the new fabric was spent on** — and both were needed, because a perfectly conserved hall that nobody under twenty entered would have failed the brief just as surely as a well-used room that destroyed a heritage interior.

Example 4 — unscaffolded

Evaluate how effectively the *EMUWREN* touring exhibition responds to **environmental** factors, in both senses of the term. (6 marks)

EMUWREN responds to the environmental factor in an unusual position, because its site is not fixed but **unknown**, and it responds well in one sense and only partly in the other.

In the **site** sense, the designer cannot survey a site at all: across eleven venues the ceiling ranges from 2.7 m to 6 m, one host is a skylit shopping-centre atrium at high daylight levels and another is a school hall with a springy timber floor. The response is to make the exhibition carry its own conditions: a printed felt runner defines the route on any

floor, self-levelling feet cope with any surface, matt laminate and UV-stable pigment inks keep the panels readable and unfaded under a skylight, and hardwood lippings glued to the panel edges survive being packed and unpacked twenty-two times. This is a strong response, because instead of assuming a site it designs for the *range* of sites, and it is testable — a panel that is legible at 900 lux is legible anywhere on the tour.

In the **impact** sense the response is genuine but narrower. The plywood is plantation-certified, the inks are water-based, and the panels are designed to be **re-skinned** for the next exhibition rather than rebuilt, which is the decision that matters most because it makes the structure outlive its content. Against that, a two-year tour of eleven venues is a great deal of road freight in a 3.5 t van, and the design does nothing about it; the felt runner is a consumable; and although the panels can be re-skinned, nothing in the brief commits anyone to doing so.

There is also a point where the two senses **agree**, which is worth naming: the decision to carry no projector — forced by the technological reality that four venues cannot black out and two have no spare circuit — also removes the exhibition's largest energy load and its most failure-prone component.

∴ EMUWREN's response to the environmental factor is effective where the designer had control and incomplete where they did not. The site sense is answered thoroughly and cleverly, by designing for variability rather than for a place; the impact sense is answered in materials but not in transport, which is the largest impact a touring exhibition has. A design that toured half as many venues for twice as long at each would have addressed it — and that was a decision for the commissioning network, not for the designer.

Practice questions

Scaffolded

Q1. Naming and tracing a factor: (a) Name the five factors that impact environmental design projects, using the Study Design's terms. (2 marks) (b) The HEATHWREN deck sits 900 mm above natural ground on screw piles. Name the factor behind this decision and state the specific driver. (2 marks) (c) State the outcome of that decision. (1 mark)

Q2. Cultural and social factors at FIELDWREN: (a) Define a **cultural** factor and a **social** factor as they apply to environmental design. (2 marks) (b) Classify each of the following FIELDWREN decisions as cultural or social, and justify each in one sentence: the study pod bolted 150 mm clear of the brick; the twelve powered desks and public wi-fi; the felt baffles and carpeted reading zone. (3 marks)

Q3. The environmental factor: (a) State the two senses in which “environmental factor” is used, and give one HEATHWREN decision for each. (3 marks) (b) A student writes: “Environmental factors impacted the HEATHWREN pavilion because the site is next to a wetland.” Identify the **three** links of the analytical chain that are missing from this answer. (2 marks)

Q4. Technological factors at FIELDWREN: (a) State the feature of the 1908 wall construction that prevented the walls being insulated in the usual way. (1 mark) (b) Explain the “room inside the room” strategy the designer used instead. (2 marks) (c) Explain why the baffles and services hang from a freestanding steel frame rather than from the existing trusses. (2 marks)

Q5. Elements in environmental design: (a) Distinguish between **shape** and **form**, and state which one the HEATHWREN site plan shows. (2 marks) (b) Name the element that a designer is using when they set a deep eave so that a deck is shaded all summer, and state its function here. (2 marks) (c) Explain the difference between the **feature** and the **function** of a design element, using the recycled brick of the HEATHWREN service core. (2 marks)

Q6. Principles in environmental design: (a) Distinguish between **scale** and **proportion**. (2 marks) (b) Explain what **human scale** means, and identify one feature of the HEATHWREN pavilion that creates it. (2 marks) (c) State whether the HEATHWREN pavilion is symmetrically or asymmetrically balanced, and explain what that balance makes the building read as. (2 marks)

Unscaffolded

Questions 7–20 refer to the HEATHWREN Wetland Pavilion, the FIELDWREN Reading Room and the EMUWREN touring exhibition shown in this subtopic, as indicated in each question.

Q7. Analyse how **economic** factors impacted the FIELDWREN Reading Room. (4 marks)

- Q8.** Analyse how **social** factors impacted the HEATHWREN project, referring to decisions at more than one scale. (5 marks)
- Q9.** Explain how **cultural** factors impacted the HEATHWREN project, referring to at least two design decisions. (4 marks)
- Q10.** Analyse how **technological** factors impacted the EMUWREN touring exhibition. (4 marks)
- Q11.** Explain how **environmental** factors impacted the FIELDWREN Reading Room in **both** senses of the term. (5 marks)
- Q12.** Compare how **economic** factors impacted HEATHWREN and EMUWREN. (6 marks)
- Q13.** Discuss how the elements of **tone** and **texture** have been used in the FIELDWREN Reading Room, and state the function of each. (4 marks)
- Q14.** Analyse how **line** and **hierarchy** are used to move a first-time visitor across the HEATHWREN site. (5 marks)
- Q15.** Explain how **contrast** (as compression and release) and **cropping** are used on the approach to and arrival at the HEATHWREN pavilion. (4 marks)
- Q16.** Explain how **pattern (repetition)** and **figure–ground** function in the HEATHWREN project, referring to the section for one and the site plan for the other. (4 marks)
- Q17.** At FIELDWREN, the tall north windows were the subject of a conflict between factors. Explain the conflict, state which factor was given priority, and state what that priority cost. (4 marks)
- Q18.** The council decides that the HEATHWREN pavilion must also serve as a **night-time heatwave refuge**, open and staffed until midnight on extreme-heat days. Explain how **three** of the five factors would change the designer's decisions. (5 marks)
- Q19.** Evaluate how effectively the design elements and principles of the EMUWREN exhibition serve its diverse audience. (6 marks)
- Q20.** Explain the difference between a **factor that impacts an environmental design project** and a **design criterion in the brief**, using one example of each from HEATHWREN. (4 marks)

Answers

Q1. (a) Economic, technological, cultural, environmental, social. (b) Environmental (site sense) — the reserve floods to about 600 mm in a one-in-ten-year event. (c) 300 mm of freeboard above that flood level, so the deck and its structure stay dry. **Q2.** (a) Cultural = shared beliefs, traditions, histories, heritage and community practices; social = how people live and function — age, mobility, safety, inclusion. (b) Pod bolted clear of the brick = cultural; powered desks and wi-fi = social; baffles and carpet = social. See solutions. **Q3.** (a) The site the place must sit in (e.g. the 2.4 m north eave against a 76° summer sun); the impact the place has (e.g. the rain garden treating car-park run-off). (b) The specific driver, the design decision and the outcome. **Q4.** (a) Solid double brick with no cavity. (b) A freestanding insulated study pod and new linings inside the shell, plus underfloor insulation from below. (c) The 1908 trusses were sized for a roof only, and hanging new loads from them would alter heritage fabric. **Q5.** (a) Shape = two-dimensional; form = three-dimensional. The site plan shows **shape**. (b) Tone — it puts the deck in shade all summer, which is why people stop and sit there. (c) Feature = what it is (rough, warm, recycled red brick); function = what it does (anchors the west end, resists wear and graffiti, blocks the low western sun). **Q6.** (a) Scale compares the place to something outside it (usually the body); proportion compares the parts of the place to one another. (b) Sized against the human body; the eave edge about 2.4 m above the deck. (c) Asymmetrical — it reads informal, a park building rather than a civic one. **Q7–Q20.** See fully-worked solutions.

Fully-worked solutions

Q1. (a) **Economic, technological, cultural, environmental and social** (2 marks for all five correctly named; 1 mark for three or four). (b) The factor is **environmental**, in the **site** sense. The specific driver is that the reserve is a former drainage reserve that floods to about 600 mm in a one-in-ten-year event. (c) The deck sits 900 mm up, giving **300 mm of freeboard** above that flood level, so the deck, the tables and the structure stay dry and the pavilion does not have to be cleaned out and repaired after every large storm (1 mark — the outcome, not the decision).

Q2. (a) A **cultural** factor is a shared belief, tradition, history, heritage or community practice attached to a place and its people, which governs what the place means and what may be done to it. A **social** factor is a feature of how people live and function — age profile, mobility and accessibility, safety, household patterns and who is included. (b) **The study pod bolted 150 mm clear of the brick — cultural:** the driver is that the hall is the town's oldest civic building and its fabric carries community memory (and a heritage overlay), so new work is made reversible and legibly new. **The twelve powered desks and public wi-fi — social:** the driver is that many households in the shire have no home internet and the town's teenagers have nowhere to study, which is about how people live, not what they believe. **The felt baffles and carpeted reading zone — social:** the driver is that a hall built hard for public speaking is unusable for quiet study, so the acoustic treatment serves how the room is now used (3 marks: one per decision, awarded for the justification rather than the label).

Q3. (a) First, the **site** the place must sit in — orientation, climate, sun angle, wind, flooding, soil, vegetation. *HEATHWREN decision:* the roof falls to the north and cantilevers a 2.4 m eave that stops the December sun 1.5 m short of the deck edge. Second, the **impact** the place has on the natural environment — materials, energy, water, habitat, waste. *HEATHWREN decision:* a rain garden between the car park and the wetland filters run-off before it reaches the water (accept the 15 000 L tank, the screw piles, or the unlit boardwalk). (b) The student has given link 1, the factor, attached to a description of the site. Missing are **link 2, the specific driver** — that the reserve floods to about 600 mm and the summer sun stands at 76°; **link 3, the design decision** — the deck went up 900 mm on screw piles and the eave went out 2.4 m; and **link 4, the outcome** — the deck, the tables and the structure stay dry above the flood and the deck stays shaded right through summer. Naming a site is not naming an impact on the designer (2 marks: all three missing links; 1 mark for two of them).

Q4. (a) The walls are **solid double brick with no cavity** (and no existing insulation). (b) Because the shell could not be insulated without either losing the brick internally or altering the heritage façade externally, the designer built a **warmer, quieter room inside the room:** a freestanding plywood study pod with its own insulated shell, new linings that stand clear of the brick, and insulation added to the suspended floor from below, where it is invisible and reversible. The building is therefore conditioned where people actually sit rather than as a single 5.4 m-high volume (2 marks: the strategy named + why the shell could not be treated). (c) The 1908 trusses were sized to carry a roof, not services and acoustic baffles, so loading them would have been a structural risk; and fixing into them would have altered heritage fabric permanently. A freestanding steel frame that touches only the floor carries the new load independently and can be unbolted and removed, which satisfies both the structural and the conservation requirement (2 marks).

Q5. (a) **Shape** is a two-dimensional enclosed area — height and width only. **Form** is three-dimensional, with depth as well, and is the massing you walk around and through. A **site plan** is a two-dimensional drawing, so it shows **shape** — the footprint of the pavilion, the outline of the wetland and the car park. (b) The element is **tone** — light and shade. Its function here is that the eave keeps the deck in shade through summer, and because shade is the scarce thing on an exposed reserve in January, the tone is the actual reason people stop, sit and stay (*accept “form” if the answer argues the eave as massing, but tone is the better answer*). (c) The **feature** is what the element is and its describable properties: a rough, warm, recycled red-brick surface with a coarse texture. The **function** is the job it does: it anchors the west end visually, it resists wear and graffiti in a public reserve, and it blocks the low western afternoon sun. Feature answers “what is it?”; function answers “what does it do to the place and the people in it?” (2 marks).

Q6. (a) **Scale** is the size of the place measured against something outside it — usually the human body, sometimes its neighbours or its setting. **Proportion** is the size relationship between the parts of the place itself — width to height, window to wall, path width to tree height. “The eave sits a little above head height” is scale; “the shelter is 7.2 m deep and about 3.5 m high, roughly 2:1” is proportion (2 marks). (b) **Human scale** means the place is sized so that its dimensions are comfortably related to the body of the person using it, rather than to a monumental or institutional idea. At HEATHWREN the eave edge is about 2.4 m above the deck — a little above head height — so the roof shelters rather than impresses (*accept the 3.6 m bay width, sized to one table and one family*). (c) The pavilion is **asymmetrically balanced**: a heavy, closed recycled-brick service core at the west end is set against four light, open bays to the east. Asymmetry reads as informal and relaxed, so the building reads as a **park shelter rather than a civic monument** — which is appropriate, because people should feel free to walk in and occupy it without permission (2 marks).

Q7. FIELDWREN’s economic factor arrives in two forms, and both changed the design.

Driver 1 — the size and source of the money. A\$1.1 million from the shire plus a state library infrastructure grant had to convert an entire 1908 hall. *Decision:* adaptive reuse rather than a new building, retaining about 85% of the existing structure, and concentrating the spend on a small number of insertions — a study pod, a steel frame, the desks — rather than on upgrading the whole shell. *Outcome:* the town gets a finished, usable room for about a third of what an equivalent new library would have cost, at the price of a building that will never perform thermally like a new one.

Driver 2 — a condition attached to the grant. The grant required the room to be open sixty hours a week, which a shire of 8 400 people cannot staff. *Decision:* an after-hours self-service access system and a layout that is safe and legible without a staff member present — a single open volume with clear sightlines, and the enclosed pod placed where it can be seen into. *Outcome:* the opening-hours condition is met without an ongoing wages cost the shire could not carry.

∴ in environmental design the economic factor is rarely just “the budget”: here it decided **whether to build at all or to reuse**, and a *condition attached to the funding* reached all the way down into the plan (4 marks: at least two economic drivers, each traced to a specific decision and an outcome).

Q8. *Site scale.* The driver is a growth-area population with a median age of 31 — prams, small children, a primary school that books the outdoor classroom, older residents walking the loop, and teenagers using the reserve after dark. *Decision:* a continuous 1.8 m path at a grade no steeper than 1:20 from the car park to the pavilion and on to the boardwalk, and planting kept below 600 mm along that path. *Outcome:* two prams pass without either leaving the path, a wheelchair user needs no ramp and no assistance, and because nothing between knee and shoulder height blocks the sightlines, people can see and be seen along the whole route — passive surveillance built into a planting specification.

Space scale. The driver is that a public shelter must serve a family group, a school class and a lone walker at the same time. *Decision:* four open 3.6 m bays rather than one undivided space, two 10-seat tables, and an outdoor classroom deck at the eastern end. *Outcome:* a class of thirty can occupy the deck while a family occupies one bay, and neither has to displace the other.

Detail scale. The driver is older users and long walks. *Decision:* seats with backrests **and armrests** every 60 m, not benches. *Outcome:* an armrest is what lets a person with limited leg strength stand up again, so the loop becomes walkable for people who would otherwise not attempt it.

∴ the social factor is answered at all three scales, which is why it works; a project that had answered it only at site scale would have a compliant path and nowhere to rest (5 marks: at least three drivers traced to decisions and outcomes, and decisions identified at more than one scale).

Q9. Decision 1 — the planting and the interpretation. The driver is that the reserve is on Country. The council engaged the Traditional Owner corporation through the cultural-heritage process applying to the site, and the design carries that into the fabric: the planting palette is entirely local heathland species, and the boardwalk interpretive panels name plants in language alongside English, with the Traditional Owners' permission and with the content remaining theirs. The outcome is that the place tells the story of its own Country rather than a generic one, and it does so with authority rather than by assumption.

Decision 2 — how the shelter is furnished. The driver is how this particular community eats: large extended-family groups, cooking outdoors, sharing one table. The designer provided two 10-seat tables and a covered barbecue bay built into the brick spine wall, instead of the six four-seat settings a standard council specification would have given, and kept the adjacent lawn flat and clear for groups that outgrow the pavilion. The outcome is that a family of fourteen can use the pavilion as one group rather than splitting across three tables — the difference between a place a community uses and one it walks past.

∴ the cultural factor shaped both **what the place is made of and named with** and **what it is furnished with** — and in both cases it produced a different object from the default (4 marks: the cultural drivers identified, at least two specific decisions, and the outcomes named).

Q10. Driver 1 — the venues' services. Four of the eleven venues cannot black out and two have no spare power circuit. **Decision:** no projection anywhere in the exhibition; the interpretation is carried by printed panels, real specimens and battery-powered LED task lights instead. **Outcome:** the exhibition installs identically at every venue, and its most failure-prone and power-hungry component never has to be trusted to a school hall.

Driver 2 — the available fabrication and transport technology. **Decision:** nine identical 900 × 2100 mm plywood panels cut from **one CNC file**, folding steel feet, self-levelling adjusters, and six road cases sized to a 3.5 t van. **Outcome:** two people install the whole exhibition in a day with a single hex key, which is what makes an A\$3 200 touring fee possible; and because every panel is the same part, a damaged panel is replaced from one file rather than rebuilt.

Driver 3 — the physical conditions the technology must survive. **Decision:** UV-stable pigment inks, matt laminate and hardwood lippings glued to the exposed plywood edges. **Outcome:** the panels stay legible under an atrium skylight and survive twenty-two pack-downs.

∴ the technological factor at EMUWREN worked mostly by **subtraction** — what the venues cannot supply removed a whole medium from the exhibition — and the design is stronger for having been forced to carry its meaning in print, objects and light (4 marks: at least two technological drivers traced to decisions and outcomes; credit the recognition that an absent technology is a technological factor).

Q11. Sense 1 — the site. The drivers are a regional climate that frosts to about −2 °C in winter and reaches 38 °C in summer, and a shell of solid uninsulated double brick with a large thermal mass — an asset on a hot afternoon, a liability on a July morning — together with twelve tall windows, six of them facing north into the sun and six facing south into the cold. **Decisions:** secondary glazing to the six south windows, where the heat loss is; internal reversible louvres inside the north reveals, to keep the free winter daylight while controlling summer heat and glare on screens; underfloor insulation added from below; and a reverse-cycle system sized and zoned for the occupied part of the room rather than for the whole 5.4 m-high volume. **Outcome:** the room is comfortable where people sit, without pretending an 1908 hall can be made to perform like a new building.

Sense 2 — the impact. The driver is that the largest environmental decision in any building project is whether to build one at all. **Decision:** adaptive reuse — about 85% of the existing structure is retained. **Outcome:** the embodied carbon of a new structure, and the demolition waste of the old one, are both avoided outright, and this single decision outweighs every other impact measure in the project. Supporting decisions follow the same logic: recycled-content plywood, and insertions that are bolted so they can be removed and re-used rather than demolished.

∴ FIELDWREN shows the two senses pulling in the *same* direction for once — reuse is the best answer to the impact sense, and it is reuse that created the site-sense problem of an uninsulated shell, which the designer then solved locally

rather than globally (5 marks: both senses treated, at least two decisions in each, and the relationship between them named).

Q12. Economic factors dominated both projects, but because the two designers were spending different kinds of money on different kinds of place, the same factor produced opposite architecture.

HEATHWREN. The drivers were a A\$1.9 million capital budget from a council reserve fund and a growth-areas grant, and an asset team that costs **fifty years of maintenance** before approving a material. The decisions that followed were durable and expensive-per-unit: a Colorbond roof and hardwood decking rather than coated steel and softwood; a recycled-brick core rather than a lightweight one; a structure a regional builder could erect with a small crane and no concrete pour, which kept the work inside local tender prices; and a leased kiosk shutter that returns rent toward upkeep. The outcome is a permanent object built to be cheap to *own*.

EMUWREN. The drivers were a total budget of A\$180 000 and a touring fee of A\$3 200 a venue, which buys two people, one day and one hex key. The decisions that followed were the opposite: nothing custom-built for any venue, nine identical panels from a single CNC file, road cases that double as plinths and seats so nothing is carried twice, and no projector to hire, transport or repair. The outcome is a temporary object built to be cheap to *move and to install*.

The similarity is that in both projects the economic factor governed the **architecture of the thing itself** — how it is divided into parts and how those parts are joined — rather than merely its finish. **The difference** is which cost each was optimising: HEATHWREN minimises **whole-of-life cost** on one site, so it buys durability up front; EMUWREN minimises **cost per installation** across eleven sites, so it buys repetition and speed. ∴ economic factors do not push environmental design toward “cheaper” in the abstract — they push it toward whatever is cheap in the *life* the place will actually lead, and a fifty-year pavilion and a two-year tour lead opposite lives (6 marks: at least two drivers traced on both projects, a congruent similarity and difference, and an evaluative conclusion).

Q13. Tone — *feature*: the reading room is lit almost entirely by daylight from twelve 2.9 m windows, six of them facing north, and the new internal louvres let that light be modulated through the day rather than blocked. *Function*: tone does the wayfinding and the zoning that no wall is allowed to do in a heritage volume — the bright north wall is where the study desks go, and the darker southern side, under the low shelving and beside the pod, is where quieter, more enclosed use naturally settles. Because the light moves, the room’s character changes between a bright morning and a low winter afternoon, and the louvres are what stop that becoming glare on twelve screens.

Texture — *feature*: the palette sets rough, aged surfaces against smooth new ones — exposed 1908 Baltic pine boards and bare brick against birch-faced plywood, felt baffles and carpet. *Function*: texture does two jobs at once here. Acoustically it is the whole point: a hall built hard for public speaking was unusable for study, and the felt and carpet absorb what the brick and boards reflect. Visually the contrast of old and new textures is what makes the insertion **legible as new**, which is exactly the conservation outcome the cultural factor demanded — you can see at a glance what is 1908 and what is 2025.

∴ in an interior the elements are doing physical work, not only compositional work: tone allocates the uses and texture controls the sound (4 marks: both elements with a feature and a function, and the functions expressed behaviourally or physically).

Q14. Line sets the route. From the car park a single 1.8 m paved path runs due north as one uninterrupted line to the pavilion — there is no fork and no choice to make. On arrival, the long horizontal **line** of the roof edge, held parallel to the water, turns the visitor’s attention through ninety degrees and along the length of the deck; and from the deck’s eastern end a second path line carries on to the boardwalk, which is itself a 105 m line drawn as a closed loop so that a walker returns without retracing. Lines here are also edges: planting kept below 600 mm means the path’s edges never become walls, so the route is legible from anywhere on the site.

Hierarchy ranks those lines. The path from the car park to the pavilion is **primary** — widest, straightest, most direct, and terminated by the only tall object on the site. The deck-to-boardwalk link is **secondary** — narrower, and it begins only once you have arrived. The lawn edge and the connection east to the shared trail are **tertiary**. The pavilion itself is primary in the massing for the same reason: on a flat reserve it is the single vertical element, so it operates as the landmark **point** that the primary line points at.

∴ a first-time visitor never has to be told where to go, because the widest line leads to the tallest object and everything else is visibly subordinate — which is precisely what hierarchy is for in a place you walk through rather than look at

(5 marks: line and hierarchy each identified with specific evidence, at least two ranks named, and the effect on the visitor's movement stated).

Q15. Contrast, as compression and release. On the approach the visitor is in the open: a car park, then a straight path across a flat reserve in full sun, with the whole sky overhead. Stepping up onto the deck they pass under a 2.4 m eave — the sky is suddenly cut to a horizontal band, the light drops sharply into shade, and the space is low. Two paces further the shelter opens out to 3.6 m above the deck at the back and the north side is entirely open to the water. Bright–low–dark–high, in about four steps: that compression and release is what makes arriving at a small park shelter feel like arriving somewhere.

Cropping. Standing under that eave, the roof edge above, the deck edge below and the timber columns either side frame the wetland into a long horizontal picture. The eave cuts the sky out of the view and the deck cuts out the foreground, so what remains is water and heathland — the thing the project exists to show. From the open lawn the same wetland is merely present; from under the eave it is composed.

∴ both principles are doing the same job by opposite means — contrast makes you *notice that you have arrived*, cropping tells you *what to look at now that you have* — and neither works from a photograph, because both depend on moving through the sequence (4 marks: each principle identified with specific evidence, and the effect on the visitor's experience stated).

Q16. Pattern (repetition) — in the section. Seven glue-laminated portal frames stand at 3.6 m centres under one plane of roof. The repetition unifies a 21.6 m building that would otherwise read as a long shed, and it sets a rhythm you feel as you walk the deck. More usefully, because each open bay holds one setting — a table, the barbecue bay, the classroom deck — the repeated structure divides the shelter into a row of small rooms: a family can occupy one bay without appearing to take the whole pavilion, and a school class can occupy the eastern end without closing the pavilion to anybody else. The rhythm is therefore not decoration — it is how a single public building is shared by strangers at the same time.

Figure–ground — in the site plan. The solids are small and few: the pavilion, the car park, the paths and the boardwalk. The ground is the wetland, the heathland and the lawn, and it occupies most of the site. Reading the plan this way makes the project's priority obvious — the built figure is deliberately minor, placed at the southern edge so that the void is continuous and the water is never cut in half. The boardwalk is the one solid allowed into the void, and it is drawn as a thin loop so that it reads as a line across the ground rather than as a building on it.

∴ repetition organises the **object** and figure–ground organises the **site**; naming which drawing you read each from — section and plan — is what makes the analysis specific (4 marks: both principles with specific evidence from the nominated drawing, and a function for each).

Q17. The conflict. The **social** factor argued for changing the north windows: twelve powered study desks sit under them, and unmodified 2.9 m north-facing glass throws direct summer sun and hard glare across every screen, which would make the desks unusable for much of the day. The **economic** factor agreed, because the cheapest fix — an external awning or a film applied to the glass — is a few thousand dollars. Against them, the **cultural** factor: a heritage overlay covers the street façade and the tall windows are part of what the town remembers about the hall, so nothing may be added to the outside of the building and the glass itself must remain.

Which won. The cultural factor won on the exterior. Nothing was added outside and no glass was changed. The social problem was then solved **on the inside**, with reversible white-painted timber louvre blades set in slim frames inside the window reveals, which control glare and summer heat while leaving the façade exactly as it was from the street.

What it cost. The internal louvres cost about A\$46 000 — many times an external solution — and the money came from deleting the planned north courtyard landscaping, which was deferred to a later, unfunded stage. There is a second cost: an internal shading device stops the sun *after* it has entered the glass, so it controls glare well and heat gain only partly, which is why the reverse-cycle system had to be zoned rather than reduced.

∴ the finished building is the record of the priority — the façade is untouched, the courtyard is not built, and the compromise is visible in the room (4 marks: the conflict stated with both sides, the priority identified from evidence in the building, and a real cost named).

Q18. A heatwave refuge open until midnight is a change in the **social** brief, and it propagates.

Social. The drivers change from daytime recreation to night-time shelter for people whose homes are unsafe in extreme heat — often older residents, people on low incomes and people without air conditioning. *Decisions:* the pavilion can no longer be an open-sided shelter, because a refuge must be enclosable and cooled; at least the eastern bays need glazed or shuttered infill, lockable and staffed; seating must suit people staying for hours, not minutes; and accessible toilets must be available at night, which changes the security design of the brick core. The main path must now be lit to a standard that supports use at midnight by people with poor vision.

Technological. *Drivers:* a cooled enclosed space needs a mechanical system, and a refuge cannot fail. *Decisions:* an insulated ceiling lining under the roof, sealed and shaded infill panels to the open bays, a reverse-cycle system sized for the enclosed bays, and — because a heatwave is exactly when the grid is stressed — roof-mounted photovoltaics with a battery so the refuge survives an outage. Note that this loads the roof, which the glulam portals were not sized for, so the structure must be re-checked.

Environmental. *Drivers:* the site sense now dominates — the pavilion must hold a low temperature through a 40 °C evening — while the impact sense resists, because lighting a wetland reserve at midnight is exactly what the original design refused to do. *Decisions:* keep the 2.4 m eave and add insulation and thermal mass rather than more cooling capacity; light only the car-park path and the enclosed bays, with warm, downward-shielded, timer-controlled luminaires; and keep the boardwalk gated and dark, so the refuge function is contained to the built footprint and does not colonise the habitat.

∴ one change to one factor forces decisions in at least three, and it also **reverses a trade-off the original design had already settled** — the boardwalk lighting question comes back, and the answer has to be defended again on new grounds (5 marks: three factors, each with a changed driver and at least one specific decision; credit any answer that notes the structural consequence or the return of the lighting conflict).

Q19. EMUWREN's elements and principles are aimed squarely at a very wide audience — toddlers to older adults, across a gallery, a school hall, a library foyer and a shopping centre — and they serve it well in most respects and incompletely in one.

Strengths. **Colour** does the navigation: three habitat zones are colour-coded, so a visitor knows which zone they are in without reading anything, and a child or a person with limited English can follow the exhibition as a sequence of places rather than a sequence of texts. **Type** is used with a genuine hierarchy — a 90 mm cap-height zone title readable across an 18 m atrium, a 60-word key idea at 24 pt, a 120-word detail at 14 pt — so three depths of engagement are offered from the same panel and a visitor can take the shallowest without feeling they have missed the exhibition. **Scale** is measured against bodies rather than against the room: every primary line of text sits between 800 mm and 1800 mm above the floor, which is the band a seated wheelchair user and a standing adult can share, and the tables are 750 mm high with 700 mm of knee clearance. **Contrast** is specified, not assumed — a tonal ratio of at least 4.5:1 — which is what makes the text usable for a visitor with low vision under a skylight. **Texture** is used deliberately for children, in tactile specimen trays, and **line** organises the whole plan: a printed felt runner draws one unambiguous route with a 1.2 m minimum aisle, wide enough for a wheelchair and a pram to pass, and the road-case plinths double as rest seats along it.

Limitations. The **hierarchy of the route** is single and linear: it works beautifully for a first visit but offers no short version, so a visitor with limited stamina or a restless three-year-old must either do the whole loop or leave. The burrow is placed off the main aisle, which protects circulation, but a carer who cannot crawl in cannot supervise from the aisle without blocking it. And the 90 mm titles were sized for an 18 m atrium; in a school hall with a 2.7 m ceiling that same scale is overbearing, and nothing in the kit adjusts it.

Judgement. For **accessibility** — reach, contrast, aisle width, seated and standing sightlines — the response is specified numerically and is genuinely inclusive rather than gestural. For **variety of engagement** it is strong: colour, type, object and touch each offer a different way in. For **the range of venues** it is only partly successful, because a set of decisions optimised for the largest and brightest venue is carried unchanged into the smallest. ∴ EMUWREN serves the diversity of its *people* better than the diversity of its *rooms*, and a second, smaller title size in the same kit would have closed most of the gap (6 marks: several elements and principles analysed against named audience needs, at least one substantiated limitation, and an overall judgement that distinguishes what is served well from what is not).

Q20. The two are easy to confuse because they both constrain the designer, but they come from different places and do different work.

A **factor that impacts an environmental design project** is a pressure from *outside* the project that changes what the designer decides. It exists whether or not anyone writes it down, it is discovered by research and site analysis, and it is usually a *condition*. **Example:** the HEATHWREN reserve floods to about 600 mm in a one-in-ten-year event, and the sun stands at about 76° at midday in December. Nobody chose those; the designer found them, and they produced the 900 mm deck height and the 2.4 m eave.

A **design criterion** is a statement *inside the brief* of what the finished solution must do or be, against which the solution will later be **evaluated**. It is written by the client and designer together, it is a decision rather than a condition, and it can be changed by agreement. **Example:** “the pavilion must be usable by a class of thirty students without displacing other park users” is a criterion — a target the design is measured against, which produced the four separate bays and the outdoor classroom deck.

The relationship between them is the useful part: factors are the **evidence** from which criteria are written. The flooding (a factor) is why the brief carries a criterion about a serviceable, dry deck. ∴ the test is direction and origin — a factor presses in on the project from the world outside it, whereas a criterion is set within the project as the standard the solution must meet (*4 marks: both defined, one correct example each, and the relationship or the direction made explicit*).

Topic Test 3 — Three-dimensional objects; design, place and time

Reading time: 5 minutes • Writing time: 45 minutes • Total 40 marks

Structure of test

Section	Number of questions	Number of questions to be answered	Number of marks
A	4	4	24
B	3	3	16
		Total	40

Materials: pens, pencils, coloured pencils, fineliners (0.6 mm or less), eraser, ruler, set squares, protractor, compasses, circle and ellipse templates. No technology and no notes.

Refer to the **Resource Sheet** on the following page. All questions must be answered.

This test covers Chapters 5 and 6: designing three-dimensional objects — elements, principles and methods, rendering, and technical drawing conventions; and design, place and time — the design process for environmental projects, styles and traditions, and contextual factors. Drawings must be completed in the spaces provided. All projection in this test is Australian third angle (AS 1100).

This topic test mirrors the structure, timing and materials of the VCAA examination. It is an original ClassBasics paper; no VCAA question is reproduced.

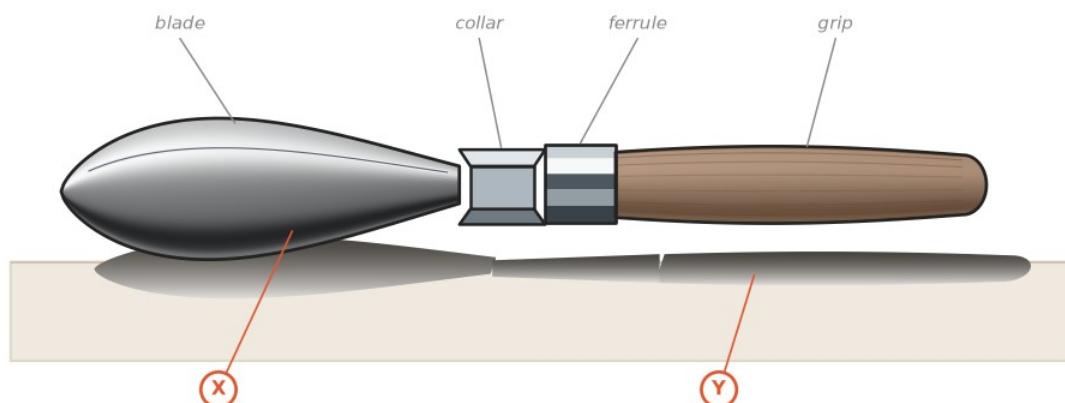
Topic Test 3 — Resource Sheet

Use these design examples to answer Section A. Each example is an original ClassBasics artifact created for this paper.

Design example 1 — Objects

BORONIA hand trowel — rendered presentation drawing

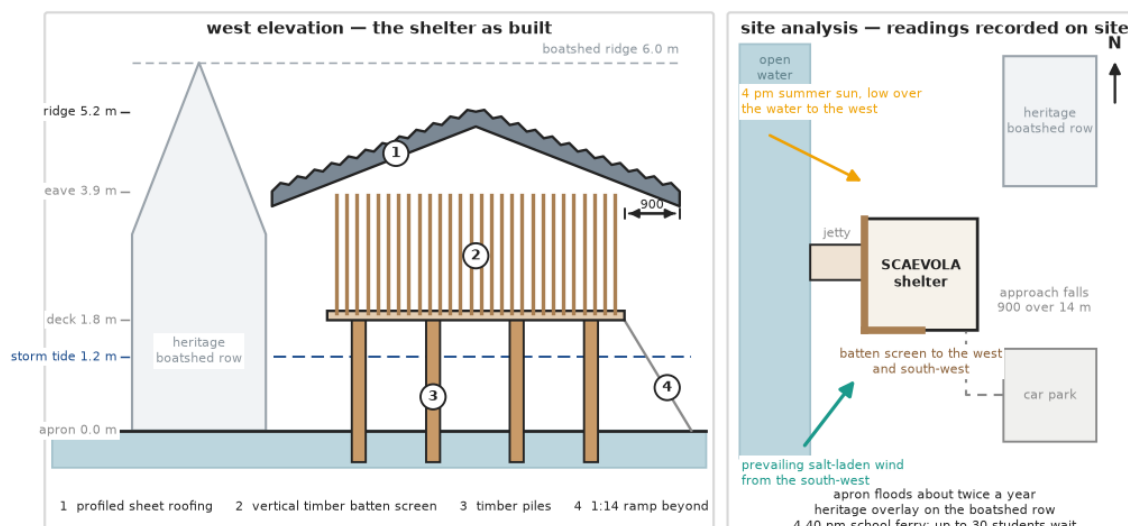
tool library, community plant nursery · pressed from one piece of recycled stainless steel, with a replaceable turned grip · 2026



BORONIA — hand trowel for the tool library of a community plant nursery; pressed from one piece of recycled stainless steel, with a replaceable turned grip. Rendered presentation drawing, 2026.

Design example 2 — Environments

SCAEVOLA Ferry Shelter — head of the town jetty, tidal river, 2026



SCAEVOLA Ferry Shelter — a 48 m² waiting shelter and ticket point at the head of the town jetty on a tidal river, 2026. The site analysis on the right was recorded on site before any design work began; the elevation on the left is the shelter as built.

Section A

Instructions for Section A: Answer all questions in the spaces provided. Where a question offers a choice, tick the box of the ONE design example you have chosen and refer to it throughout your response.

Question 1 (4 marks)

Question 1 refers to **Design example 1 — BORONIA**. There is no choice of example in this question.

- a. State the direction from which the BORONIA trowel has been lit. 1 mark
- b. Name the tonal zone labelled **X** and the tonal zone labelled **Y** on the rendering. 2 marks
- c. State one feature of the cast shadow that shows where the trowel rests on the bench. 1 mark

Question 2 (6 marks)

Question 2 refers to **Design example 1 — BORONIA**. There is no choice of example in this question.

- a. Explain how the rendering shows that the **blade** is a curved surface and that the **collar** is made of flat planes. 3 marks
- b. Identify the material simulated on the **grip**, and describe one property of that material that can be seen in the rendering. 2 marks
- c. The nursery's manufacturer says they cannot make the trowel from this drawing. Name the type of drawing they need. 1 mark

Question 3 (6 marks)

Tick the design example you have chosen:

☐ **BORONIA** (Objects) ☐ **SCAEVOLA Ferry Shelter** (Environments)

- a. Identify one design **element** that is dominant in the design example you have chosen, and describe how it appears. 2 marks
- b. Explain how **one factor** — economic, technological, cultural, environmental or social — influenced a decision the designer made in the design example you have chosen. 4 marks

Question 4 (8 marks)

Question 4 refers to **Design example 2 — SCAEVOLA Ferry Shelter**. There is no choice of example in this question.

- a. Identify one design **tradition** the designer has drawn on, and describe **two** visual characteristics of the shelter that show it. 3 marks
- b. Explain how the designer has **translated** that tradition rather than transcribing it. 2 marks
- c. Identify one **contextual factor** evident at the site — one you have **not** already used elsewhere in this test — and state the decision the designer made in response to it. 2 marks
- d. Name the stage of the VCD design process at which the site analysis was produced. 1 mark

Section B

*Instructions for Section B: Answer all questions in the spaces provided. Drawings must be completed using the drawing equipment permitted in this test. Marks are awarded for drawings that **apply** the technical drawing conventions correctly, not for writing about them.*

The manufacturing task

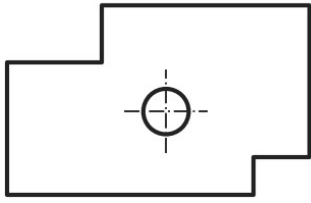
The plant nursery's tool library hangs each BORONIA trowel on a wall rail. The manufacturer needs a drawing they can make the **HIBBERTIA tool-rail clip** from — the pressed clip that carries one trowel on that rail.

The HIBBERTIA tool-rail clip is:

- 80 mm wide, 50 mm high and 30 mm deep, pressed from one piece of recycled aluminium plate
- with a **notch** 25 mm wide and 15 mm high removed from the **top-left** corner, cut across the **full depth** of the clip — this is the hook that sits over the rail

- with a **rebate** 15 mm wide and 10 mm high removed from the **bottom-right** corner, also cut across the **full depth**
- with a **Ø12 mm hole** drilled straight **through the depth** of the clip, its centre 42 mm from the left-hand edge and 22 mm from the bottom edge.

The **front view** has been drawn for you at **1:2** in the space below. Work on this drawing for Questions 5, 6 and 7.



FRONT VIEW (given)

Question 7b — isometric drawing

TITLE HIBBERTIA tool-rail clip	
SCALE	DIMENSIONS
PROJECTION	

Question 5 (8 marks)

- Complete the **top view**, projected from the given front view and drawn to the same scale. Show the projectors you use. 3 marks
- Complete the **right side view**, using a **45° mitre line** to transfer the depth from the top view. Show the mitre line. 3 marks
- Show the Ø12 hole in **both** of the views you have completed, using the correct line type, and add a **centre line** through the hole in each of those views. 2 marks

Question 6 (4 marks)

- Dimension the **front view**. Give the overall width, the overall height, the size and position of the hole, the size of the notch and the size of the rebate, using correct dimensioning conventions. Each measurement is to be given once only. 3 marks
- Complete the **SCALE** and **DIMENSIONS** cells of the title block. 1 mark

Question 7 (4 marks)

- Draw the **third-angle projection symbol** in the PROJECTION cell of the title block. 1 mark
- Draw the HIBBERTIA tool-rail clip as an **isometric** drawing in the space provided, constructing it by **crating**. 2 marks
- Explain why the isometric drawing you have made must **not** be rendered if it is to sit on this drawing sheet. 1 mark

Topic Test 3 — Answers and marking guide

Marking guide

Question	Marks	What is being assessed
1a	1	The light direction, read from where the highlights sit and which way the cast shadow falls
1b	2	Core shadow (shade) and cast shadow named, and kept distinct from one another
1c	1	The cast shadow is darkest and hardest-edged at the contact point
2a	3	Continuous gradation reads as curved; one even tone per plane with an abrupt change reads as flat
2b	2	Timber named, plus a property that can actually be seen (matte, grain following the form)
2c	1	The drawing TYPE named — a documentation drawing (third-angle orthogonal projection)
3a	2	A design element named from the Study Design's list, plus how it appears in the chosen example
3b	4	One of the five exact factor terms + the reading behind it + the DESIGNER'S decision + its effect
4a	3	A design tradition named, plus two visual characteristics described in design terminology
4b	2	The reason the feature existed is carried forward; its appearance is not copied
4c	2	A specific contextual reading not already credited in Question 3b or 4b, plus the decision made in response to it
4d	1	Discover
5a	3	Top view directly ABOVE, correct width and depth, aligned by projectors, notch wall shown
5b	3	Side view to the RIGHT, depth transferred on a 45° mitre line, rebate floor visible and notch floor hidden
5c	2	Hidden detail as thin dashed lines in both views, plus a thin chain centre line in each
6a	3	Overalls outermost, hole located from its centre lines and sized with Ø, notch and rebate sized, each

Question	Marks	What is being assessed
6b	1	measurement once SCALE 1:2 and DIMENSIONS IN MILLIMETRES entered in the title block
7a	1	The third-angle symbol drawn correctly (tapered profile beside two concentric circles)
7b	2	A crated isometric: 30° receding axes, measurement along the axes, both features cut, the hole as an ellipse
7c	1	Rendering would bury the lines that carry the information; rendering belongs on a presentation drawing

Question 1

a. The trowel is lit from the **upper left**, and from **in front** of the object. The evidence is consistent across every form: the brightest area of the blade, the ferrule and the grip all sit toward the **upper left**, and the **cast shadow falls away to the lower right**, which is the direction directly away from the light. (1 mark. “From the left and above” is sufficient; “from above” or “from the side” alone is not, because it does not fix the direction the shadow falls.)

b. **X** is the **core shadow**, also called the **shade** — the darkest band **on the object itself**, where the blade’s surface has turned fully away from the light. It sits just *inside* the shadow-side edge rather than at the edge, because reflected light lifts the very rim. **Y** is the **cast shadow** — the trowel’s silhouette thrown **onto the bench**, on the side away from the light. (1 mark each. Calling *X* a “shadow” gains no mark: *shade* is on the object, the shadow is cast by it. Accept “shade” for *X* and “shadow” for *Y*.)

c. The cast shadow is **darkest and hardest-edged at the contact point**, where the lower edge of the blade meets the bench, and it **lightens and softens** as it travels away. That is what anchors the trowel to the surface. (1 mark. Accept: *the shadow touches the object at the blade edge rather than floating clear of it.*)

Question 2

a. The **way the tone changes** is what tells the viewer the form, and the two parts are rendered in opposite ways.

The **blade** is read as a **curved (dished) surface** because its tone changes **gradually and continuously** across the form, with no step anywhere: a broad light area and highlight along the upper left, a wide halftone as the surface turns, a band of core shadow just inside the lower edge, and a lift of reflected light at the very rim. A curved surface has no edges, so it can have no abrupt change of tone.

The **collar** is read as a set of **flat planes** because each of its three faces carries **one even tone** across its whole area, and the tone changes **abruptly** at the edge where the next plane begins. A flat plane meets the light at one angle only, so it can only have one tone.

∴ the tonal transitions are doing more work than the outline is. Gradating the collar’s faces would make it look inflated and cushion-like, and putting a hard tonal step across the blade would read as a crease. (3 marks: *continuous gradation on the curve; one even tone per plane with an abrupt change at the edge; the consequence for how the form is read. A response that only says the blade “is shaded” gains 1 mark at most.*)

b. The grip is simulated as **timber** (accept turned hardwood, or recycled timber). A property that can be seen in the rendering: it is **matte** — a warm mid value with **low contrast** and a broad, dull highlight rather than a small hard one, because a matte surface scatters light instead of mirroring it — and it carries **grain that follows the form**, the grain lines **crowding together and foreshortening** as the surface turns away toward the silhouette. (1 mark for the material, 1 mark for a property that is genuinely visible in the drawing. “It is brown” gains no mark — that is a colour, not a property of the material’s surface. Contrast the ferrule, which is rendered as polished metal: extreme contrast, a bright band and a dark band meeting at a hard edge, and almost no gradual halftone.)

c. A **documentation drawing** — specifically a **third-angle orthogonal projection** carrying line types, dimensions, a scale and the projection symbol. (1 mark for the drawing TYPE. Accept “orthogonal drawing”, “orthographic drawing”, “technical drawing drawn to convention”. “Third-angle projection” on its own names the projection system, not a type of drawing, and gains the mark only if a drawing type is named with it. “A better rendering” or “an isometric” alone gains no mark: no measurement can be taken from a pictorial drawing, because no face is at its true size.)

Question 3

a. (Model, using **BORONIA**.) The dominant element is **form**. The trowel is built from contrasting three-dimensional forms placed end to end: a long **organic dished blade**, a small **faceted prismatic collar**, and two **cylinders** — the short polished ferrule and the longer tapered grip. The change from a flat-faceted form to a cylinder is exactly where the hand is meant to stop, so the form tells a user where to hold the tool before any label is read.

(Model, using **SCAEVOLA**.) The dominant element is **line**. Closely spaced **vertical** timber battens run the full height of the west end, from the deck to the eave, and are held between two strong **horizontals** — the deck edge and the eave line. The repeated vertical line gives the small building a visual rhythm and reads against the horizontal of the water behind it.

(1 mark for a design element correctly named from the Study Design’s list — point, line, shape, form, tone, texture, colour, type — and 1 mark for describing how it actually appears in the chosen example. Accept tone, texture or shape if described from the artifact. Naming a design principle, such as balance or contrast, or a Gestalt principle, such as similarity, gains no mark: these are three separate vocabularies.)

b. (Model, using **BORONIA**, environmental factor.) The **environmental** factor — the pressure to reduce material use and to keep material out of landfill — has changed how the tool is made. Because a tool assembled from several bonded materials cannot be separated at end of life, the designer has **pressed the blade, collar and tang from a single piece of recycled stainless steel**, so the metal can go back as one clean stream. For the same reason the **grip is a separate, replaceable turned component held in a metal ferrule** — visible in the rendering as a distinct part with its own material — rather than a handle moulded permanently onto the blade, so a worn grip can be driven out and changed without discarding the steel. The effect is a tool a nursery tool library can keep in service for years, which is where its real environmental saving sits.

(An equally creditworthy **BORONIA** response using the **economic** factor: a tool library buys tools that will be lent, damaged and repaired, so the budget is for whole-of-life cost rather than purchase price, and the designer specified a replaceable grip and a single-material head so a repair costs a handle instead of a tool. Or the **technological** factor: pressing from sheet is the process available to the manufacturer, which is why the blade is one continuous dished form with a rolled lip rather than a fabricated assembly.)

(Model, using **SCAEVOLA**, cultural factor.) The **cultural** factor is the community’s attachment to the working waterfront and the **heritage overlay** on the boatshed row beside the site. Because new work on that street has to sit with what is already there, the designer **held the shelter’s ridge at 5.2 m, below the boatshed row’s 6.0 m ridge**, and used the **same simple gable and profiled sheet roofing** as the sheds rather than a different roof form. The effect is that the shelter is read as part of the row from the apron, while the plain contemporary batten screen keeps it legible as new work.

(An equally creditworthy **SCAEVOLA** response using the **environmental** factor: the apron floods about twice a year and the highest recorded storm tide is 1.2 m, so the designer set the deck at 1.8 m on timber piles rather than on a slab. Or the **social** factor: up to 30 students wait for the 4.40 pm school ferry, so the designer provided 48 m² of sheltered deck with seating and a 1:14 ramp so the shelter can be reached by everyone.)

(4 marks: the factor named using one of the five exact terms; the reading or pressure it arises from; the **DECISION** the designer made because of it — a decision about material, form, layout, level or finish; and the effect of that decision. A response that explains why the design was **needed** rather than what the designer **decided** gains 2 marks at most. “Sustainability” is not one of the five terms — the term is **environmental**; “budget” is **economic**.)

Question 4

a. The designer has drawn on the **jetty and boatshed tradition** of the working waterfront — the way small waterfront buildings have long been made in this country. (Accept “the raised timber-pile tradition”, “the Australian shed or vernacular tradition”.)

Two visual characteristics of the shelter that show it:

- the whole building is **raised clear of the ground on square timber piles**, so the floor is a deck at 1.8 m rather than a slab on the apron;
- it is roofed with a **simple gabled roof in profiled sheet, with wide 900 mm eaves and no applied ornament at all** — no bargeboard, no bracket, no moulding.

(A third, equally creditworthy characteristic: the **vertical timber batten screen** that closes the end, a plain infill of repeated small members. 1 mark for the tradition named, 1 mark for each characteristic, described in design terminology. “It looks old” or “it is Australian” identifies nothing.)

b. The designer has kept the **reasons those features existed**, not their appearance. Piles were used on the working waterfront because the water came up over the apron — and it still does, about twice a year, to a recorded storm-tide level of 1.2 m, which is precisely why the deck is set at 1.8 m on piles. The gable and the profiled sheet are held to the boatshed row’s ridge datum so the new building sits in the street, but nothing decorative is quoted from the old sheds, and the batten screen is a plainly contemporary element sized to the actual problem — a salt-laden south-westerly and a 4 pm summer sun that comes in low over the water from the west. ∴ copying the appearance of a 1920s boatshed would be **pastiche** — the look without the logic — and would leave a visitor unable to tell 1926 from 2026. (2 marks: the feature’s original reason identified, and the same reason answered again with today’s requirements. A response that only says “he was inspired by the old boatsheds” gains no mark.)

c. Accept any one reading with the decision that followed from it, **provided it is not a reading the student has already been credited for in Question 3b or Question 4b.**

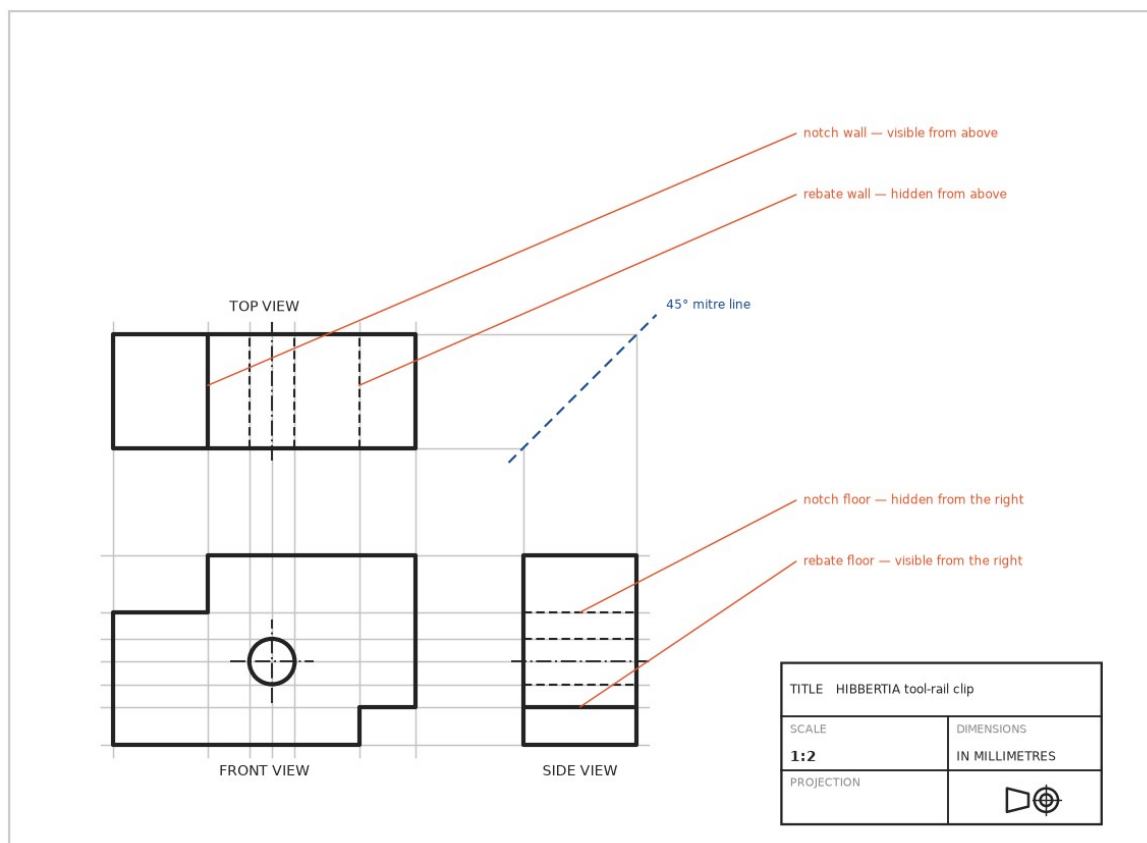
- **Climate.** The prevailing wind is a **salt-laden south-westerly**, and the summer sun is **low over the water to the west at 4 pm**, which no horizontal hood can stop. → The designer **closed the west and south-west with a vertical timber batten screen** and left the eastern side, where the approach from the car park arrives, open.
- **Physical / site.** The apron floods about twice a year, and the **highest recorded storm tide is 1.2 m**. → The designer **raised the deck to 1.8 m on timber piles**, clear of that level.
- **Built / streetscape.** The **heritage boatshed row** beside the site has a ridge at **6.0 m**. → The designer **held the shelter’s ridge at 5.2 m** and gave it the same gable form and sheet roofing.
- **Regulatory / physical.** The approach from the car park **falls 900 mm over 14 m**. → The designer provided a **1:14 ramp** from the apron up to the deck.
- **Community / social.** Up to **30 students wait for the 4.40 pm school ferry**. → The designer sized the shelter at **48 m² of covered deck with seating** rather than a bus-stop-sized hood.

(1 mark for the reading, stated specifically with its evidence; 1 mark for the decision the designer made in response. The five readings above are independent of one another, so the reading credited here must be one the student has NOT already been credited for — a student who answered Question 3b on SCAEVOLA has already used one of them, and a student who argued Question 4b from the storm tide and the piles has used the second. Do not credit the same reading-and-decision twice. “The site is windy” is a reading with no decision attached and gains 1 mark at most; “the shelter has a screen” is a decision with no reading and gains 1 mark at most. Note the hemisphere: in Australia a horizontal hood works on the **north** face, but a low **western** sun needs a **vertical** device — which is why the screen is battened vertically.)

d. **Discover** — the first stage of the VCD design process, where the designer researches the place and the people before the problem is defined. (1 mark. “Research” alone gains no mark; the Study Design’s stage names are Discover, Define, Develop and Deliver.)

Question 5

Model drawing.



a. The **top view** is placed **directly above** the front view — this is third angle, and placing it below is first angle and gains no marks. It shares the object's **width** with the front view, so it is set out on light **vertical projectors** drawn up from every corner and feature of the front view. It is an 80×30 rectangle (width $\times$ depth) in thick visible outline, carrying a **visible line at 25**: looking straight down, you see the top face and the notch floor, and the notch wall between them is an edge you can actually see. The **rebate wall at 65** sits underneath the top face and cannot be seen from above, so it is a thin dashed hidden line. Projectors and construction lines are left **thin and light** so they never compete with the outline. (3 marks: correct placement above; correct width and depth to the same scale, aligned by projectors; the notch wall shown as a visible line at 25. The rebate wall shown as hidden detail is expected and is credited under part c. if not shown here.)

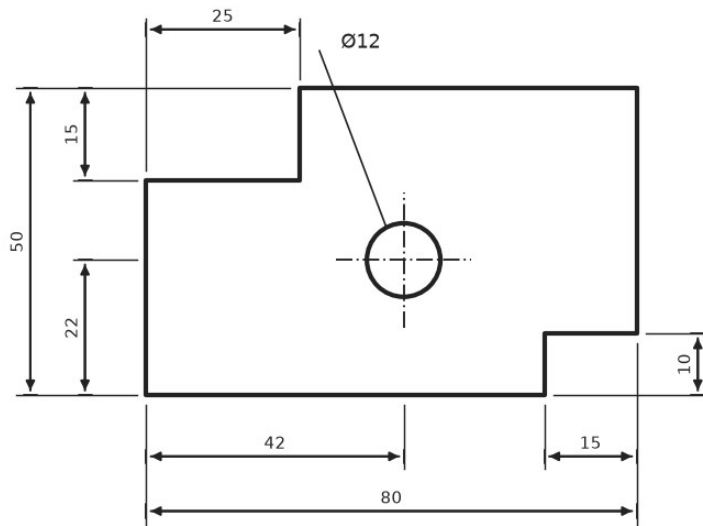
b. The **right side view** is placed **to the right** of the front view. It shares the object's **height** with the front view, so the heights are carried across on light **horizontal projectors**. Its **depth** is the measurement it shares with the top view, and that is transferred on a **45° mitre line** struck through the corner where the front edge of the top view meets the front edge of the side view: each depth is run horizontally out of the top view to the mitre line, turned through the right angle, and dropped vertically into the side view. Because the depth is *transferred* rather than measured twice, the two views cannot disagree.

The result is a 30 (depth) $\times$ 50 (height) rectangle in thick visible outline, with a **visible line at 10**, where the rebate floor is seen edge-on — both of the surfaces it separates face you from the right — and a **thin dashed hidden line at 35**, where the notch floor sits behind the full-height part of the clip. (3 marks: correct placement to the right; the mitre line drawn and used to transfer the depth; the outline correct, with the rebate floor visible at 10 and the notch floor hidden at 35.)

c. The $\varnothing 12$ hole is drilled through the depth, so it cannot be seen in either the top view or the side view. In each it is shown as a pair of **thin dashed (hidden-detail) lines** running the full 30 mm depth — at 36 and 48 from the left in the top view, and at 16 and 28 above the base in the side view. A **thin chain centre line** (long dash, short dash) is then drawn along the hole's axis in each of those views, extending a little beyond the outline. (2 marks: hidden detail as thin dashed lines in both views; a chain centre line in each. Hidden detail drawn as a continuous line, or left out "because you cannot see it", gains no mark — the maker still has to drill the hole.)

Question 6

a. Model drawing.



SCALE 1:2

DIMENSIONS IN MILLIMETRES

— the title-block entries. Model shown enlarged, not to scale.

Dimension the front view with thin **extension lines** that begin with a **small gap** from the outline and run a little past the dimension line, and **dimension lines** with **arrowheads** touching the extension lines, each figure placed centrally and clear of the line:

- the overall **80** below and the overall **50** at the left, both placed **outermost**;
- the hole located from its **centre lines** — **42** from the left edge and **22** from the bottom edge — placed nearer the view;
- the hole sized **Ø12** on a leader taken off the circle (Ø for a full hole; **R** would be wrong);
- the notch sized **25** wide, above the view, and **15** high, at the left;
- the rebate sized **15** wide, below the view, and **10** high, at the right.

Every measurement is given **once**, is dimensioned to **visible outlines**, and is placed **outside** the view; the smaller dimensions sit nearer the view and the overalls furthest out, so no two dimension lines cross. Every figure is the object's **true size** — 80, 50, 42, 22, Ø12, 25, 15, 15, 10 — even though the view is drawn at half size. (3 marks: one for the two overall dimensions placed outermost; one for the hole located from its centre lines and sized with Ø; one for the notch and the rebate both sized, with correct extension- and dimension-line convention and no measurement given twice. A figure that states the drawn length rather than the true size gains no mark.)

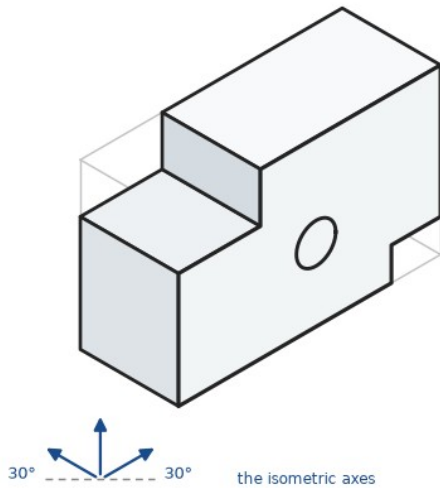
b. SCALE 1:2 in the scale cell and **DIMENSIONS IN MILLIMETRES** in the dimensions cell. (1 mark for both; accept “mm” for the dimensions cell.)

Question 7

a. The third-angle projection symbol — a small truncated cone drawn as a tapered (trapezoidal) profile beside its end view of **two concentric circles**, with centre lines — placed in the PROJECTION cell of the title block, so a reader knows the views are arranged in third angle and does not read them mirror-reversed. (1 mark; see the completed title block in the model drawing for Question 5.)

b. Model drawing.

HIBBERTIA tool-rail clip — isometric, constructed by crating



crate the $80 \times 50 \times 30$ box first;
measure only along the three axes

a circle on a skewed isometric plane
is an **ELLIPSE**, never a circle

line only — a documentation sheet
carries no rendering

the rebate is cut on the far corner:
from here it shows only as the step
in the outline

Crate the clip first: draw a light vertical for the front corner and two receding axes at **30° to the horizontal**, then build the $80 \times 50 \times 30$ box, measuring **full size along the three axes only**. Cut the 25×15 notch out of the crate at the **top left** and the 15×10 rebate at the **bottom right**, measuring both along the axes. Draw the hole as an **ellipse**, because a circle drawn on a skewed isometric plane is never a circle. Erase the crate and weight the drawing — heaviest line on the silhouette, medium between visible faces.

Which cut faces can be seen. The model above is drawn from the **front, top and left**, so the notch opens toward the viewer and shows **both** of its cut faces — the floor and the wall — while the rebate, cut into the opposite corner, shows **only as the step in the outline** of the front face. That is not a shortcut: a parallel projection can never show two opposite faces of an object at once, and this clip's two cut-outs sit on diagonally opposite corners. A drawing taken from the front, top and **right** is equally correct and simply reverses which cut-out opens up — there, the rebate shows its wall and the notch reads as a slot behind the top face. *(2 marks: receding edges parallel and at 30° , proportions taken along the axes, both features cut correctly, and the hole drawn as an ellipse. Either corner viewpoint is accepted; a cut face drawn as though visible when the viewpoint chosen puts it on the far side of the object is not correct. 1 mark for a recognisable but partly incorrect construction — for example receding edges that converge, which would make it a perspective rather than a paraline drawing, or a hole left as a circle.)*

c. A documentation drawing carries its information in its **lines**, and rendering would bury them. Tone, cast shadow, texture and material simulation obscure the visible outline, the hidden detail and the centre lines, and make the dimension figures hard to read — so shading the drawing removes information rather than adding it. Rendering belongs on a **presentation or visualisation drawing**, like the BORONIA drawing on the Resource Sheet, whose job is to show a client the material and the form. This sheet's job is to let a maker build the clip. *(1 mark; “it would look messy” alone gains no mark.)*