

HSC Construction (CPC20220) Study Guide

Focus Area 1: Work Health and Safety (WHS)

Legislation & Duty of Care: The NSW Work Health and Safety Act 2011 (WHS Act) and WHS Regulation 2017 set out legal obligations in the workplace ¹. Employers (Persons Conducting a Business or Undertaking, PCBU) must ensure a safe workplace – e.g. by eliminating hazards or reducing risks – and demonstrate **due diligence**. Workers must follow instructions and use equipment safely. Key duties include:

- **PCBU (Employer/Builder):** Provide safe systems, training, PPE, and consultation.
- **Officers (Managers/Supervisors):** Exercise due diligence (e.g. ensure compliance and risk management).
- **Workers:** Take reasonable care, follow procedures, report hazards, and use PPE.

Hazards and Risk: A *hazard* is anything with the potential to cause harm ². Common construction hazards include falls, moving machinery, noise, manual handling, hazardous materials, and human factors (fatigue, inattention) ³. A *risk* is the chance of a hazard causing injury or damage. Effective WHS begins with **hazard identification** and **risk assessment**:

- **Identify hazards:** Inspect tools, materials, environment and tasks (e.g. slip/trip hazards, chemicals, electrical).
- **Assess risk:** Determine how likely and how serious an incident could be.
- **Control risk:** Use the *Hierarchy of Controls* (see table below and diagram) ⁴.

Hierarchy of Hazard Controls – use this pyramid to reduce risk from most effective (Elimination) to least (PPE) ⁴.

Hierarchy of Control	Description / Example
Eliminate	Remove the hazard entirely (e.g. design out a fall risk) ⁴ .
Substitute	Replace hazard with something safer (e.g. use less toxic materials).
Engineer	Isolate people from hazard (e.g. guard, fence, ventilation) ⁴ .
Administer	Change the way people work (e.g. procedures, signage, training) ⁵ .
PPE	Provide Personal Protective Equipment (helmets, goggles, etc.) ⁵ .

Safe Work Procedures: To manage risks, formal procedures are used:

- **Induction/Training:** All workers must receive site induction and WHS training before work (e.g. a *White Card* General Induction in NSW) ⁶.
- **Standard Operating Procedures (SOPs):** Written instructions (e.g. for equipment use or emergencies) that must be followed.
- **Manual Handling:** Use proper techniques and assistance (team lift or mechanical aids) for lifting, and respect weight limits ⁷.
- **Hazardous Substances:** Store, label and handle chemicals safely. Always consult the Safety Data Sheet (SDS) for proper use, storage and disposal ⁸.

- **Equipment Checks:** Inspect tools/machines before use (e.g. check power cords, guards, sharpness) ⁹ .
- **Incident Response:** Report and record near-misses and injuries immediately. Fire extinguishers and first aid kits must be accessible; emergency evacuations should follow the site's plan.

Personal Protective Equipment (PPE): PPE is the last line of defence and must be used when hazards cannot be otherwise controlled. Common PPE in construction includes hard hats, safety glasses/face shields, ear protection, respirators, gloves, steel-capped boots, and hi-vis clothing ¹⁰ . Select PPE appropriate to the task (see table below).

PPE Type	Protects Against
Hard hat	Impact from falling objects or bumps ¹⁰
Safety glasses/goggles	Flying debris, dust, chemical splashes ¹⁰
Ear muffs/plugs	High noise levels (prevents hearing loss)
Respirator/mask	Dust, fumes, solvents
Work gloves	Cuts, abrasions, chemical contact ¹⁰
Steel-capped boots	Heavy objects, puncture, electrical shocks ¹⁰
Hi-vis vest/clothing	Visibility to machinery operators

Example Question: “A co-worker slips on a wet floor. Describe 3 steps you would take to manage this hazard.”

Model Answer: Identify the hazard (wet floor), isolate it (cordon off area or put up wet-floor sign), then clean up/absorb the water (substitute slip hazard with a dry surface) ⁴ . Report the incident to a supervisor and review work procedures to prevent recurrence.

Glossary (WHS):

- **Hazard:** A source/situation with potential to cause harm (injury or damage) ² .
- **Risk:** Likelihood and severity of harm from a hazard.
- **PCBU (Person Conducting a Business/Undertaking):** The legal entity responsible for health & safety.
- **Due Diligence:** Taking all reasonable steps to ensure compliance with WHS laws (e.g. verifying safety procedures).
- **Hierarchy of Control:** System for choosing the most effective control measure (as table above).
- **SDS (Safety Data Sheet):** Manufacturer's document detailing handling and first-aid measures for a chemical.

Legislation & Codes:

- *Work Health and Safety Act 2011* (NSW): Defines duties of PCBUs and workers ¹ .
- *Work Health and Safety Regulation 2017* (NSW): Specifies risk management duties.
- SafeWork NSW Code of Practice: “How to Manage Work Health and Safety Risks”.
- *Australian Standard AS/NZS 4801*: Occupational health and safety management systems (not mandatory but informative).

Focus Area 2: Skills in the Construction Industry

Planning & Measurement: Construction projects require accurate planning. Technical drawings (blueprints) are scaled representations of buildings. For example, a 1:100 scale plan means 1 cm on paper = 1 m in reality. On-site, workers use rulers, laser levels and tape measures to transfer dimensions and ensure structures fit the design. Basic formulas are used routinely, e.g.: area = length × width (for flooring), volume = length × width × depth (for concrete) – always double-check units.

Construction floor plan with scale and measuring tools – planning and measurement are key skills.

Example (Scale Calculation): If a wall is 12 m long in reality and drawn at 1:100 scale, its drawing length = $12 \text{ m} \div 100 = 0.12 \text{ m}$ (12 cm) on paper. Conversely, a drawn line of 5 cm at 1:50 scale represents 2.5 m in reality.

Estimating & Calculations: Estimating materials and costs is important. For example, calculating the number of bricks: if one brick bed covers 0.02 m^2 , and a wall is 10 m^2 , bricks needed = $10 \div 0.02 = 500$ bricks (plus allowance for waste). Estimators add extra (waste factor) and consider measurements (length, area, volume). Accuracy and checking calculations (with a partner or device) are expected.

Reading Plans & Specifications: Workers must interpret plans and specifications to understand tasks. Key plan elements include dimensions, symbols (doors, windows), levels and notes (may require reference to legend). Working drawings must be followed precisely: e.g. aligning walls to gridlines, matching materials codes.

- **Blueprint symbols:** e.g. thick lines for walls, dashed lines for features above/below, etc. Learn common symbols (door swings, window types).
- **Notes and legend:** Often specify materials or methods.

Communication & Teamwork: Good communication is a crucial skill. Workers take directions from supervisors (planners) and coordinate with trades (electricians, plumbers). Speaking clearly, listening to instructions, and asking clarifying questions avoids errors. Likewise, note-taking or filling site forms (time sheets, incident reports) is part of communication.

Example Scenario: An exam question might present a simple wall layout drawn at 1:50 scale. It asks: “What is the actual length of this wall?” A clear, step-by-step solution is expected (measure 7 cm on plan × 50 = 350 cm = 3.5 m).

Glossary (Skills):

- **Scale:** Ratio of drawing dimensions to real dimensions (e.g. 1:100).
- **Blueprint:** Technical drawing of a building project.
- **Estimate:** Approximate calculation of quantity or cost of materials.
- **Take-off:** Listing and calculating materials from drawings.

Legislation & Standards:

- *National Construction Code (NCC):* Sets minimum standards for building design and construction (e.g. structural, fire safety). Important for understanding building requirements.
- *Australian Standard AS 1100 (Technical drawing):* Guide for drawing conventions (helpful background for

reading plans).

- Work Health and Safety laws also apply when carrying out work.

Focus Area 3: Tools of the Trade

Hand Tools vs Power Tools: Construction workers use many tools. **Hand tools** (e.g. hammers, screwdrivers, chisels, pliers, hand saws) require manual effort. **Power tools** (e.g. drills, circular saws, angle grinders, nail guns) use electricity or compressed air for faster work. Key points:

- Always select the **right tool for the job**. For example, a wood chisel (for chiseling timber) is not used on metal – each has a specific use.
- Inspect tools before use: ensure blades/bits are sharp and guards are in place, power cords have no damage, and bits are correctly fitted.
- Maintain tools: keep them clean, oil moving parts, store them securely. Proper tool maintenance prevents malfunctions and injuries.

Tool Safety: Many accidents involve tools. To use tools safely:

- Wear appropriate PPE (see previous section) – e.g. eye protection is mandatory when cutting or grinding.
- Follow safe operating procedures: e.g. never remove a saw guard, hold tools firmly with both hands, turn off and unplug tools before adjusting blades.
- For power tools, use Residual Current Devices (RCDs) or safety switches on power outlets to prevent electric shock.

Types of Tools (comparison table):

Tool Type	Examples	Use
Measuring Tools	Tape measure, spirit level, carpenters square	Measure lengths/levels and mark straight lines.
Cutting Tools	Handsaw, circular saw, angle grinder, bolt cutters	Cut wood, metal, masonry, etc.
Fastening Tools	Hammer, nail gun, screwdriver, wrench	Drive nails/screws, tighten bolts.
Material Prep Tools	Chisel, plane, trowel	Shaping wood, finishing concrete/ mortar.
Lifting/Positioning Tools	Shovel, crowbar, lever	Dig, move materials, pry objects.
Safety Tools	Extension ladder, harness (for working at height)	Access high areas safely (requires training).

Equipment & Machinery: Larger equipment (e.g. concrete mixers, forklifts, excavators) require special training and licenses. Workers should not operate these unless trained. Always keep clear of moving equipment (make eye contact with driver, wear hi-vis).

Example Question: “List three hand tools you would use to install a timber door and briefly describe their use.”

Model Answer: For installing a door: a **hammer** (to drive nails into the frame), a **chisel** (to trim mortises in the door frame), and a **screwdriver** (to install screws in hinges) are used.

Glossary (Tools):

- **Chisel:** A cutting tool with a sharp metal blade, used with a hammer to carve or cut wood/metal.
- **Piler:** A handheld tool with two jaws, used for gripping, bending or cutting.
- **Bit:** The interchangeable tip for drills or drivers (wood bit, masonry bit, screwdriver bit).
- **Working at Height:** Any work conducted where a person could fall (requires ladder or elevated platforms and fall protection).
- **RCD (Residual Current Device):** Electrical safety switch that trips power if a fault occurs (reduces electrocution risk).

Legislation & Standards:

- *Australian Standard AS/NZS 1891.1:* Industrial fall-arrest systems and devices (for safe use of ladders/harnesses).
- *Australian Standard AS 3765:* Guide for safe working on mobile and fixed ladders (relevant to ladder safety).
- *Work Health and Safety Regulations:* Specify safe use of tools and equipment (e.g. ensuring guards on power tools).
- *SafeWork NSW Codes:* E.g. “Working at Heights” guidelines.

Focus Area 4: Industry Operations (Working in the Industry)

Site Communication & Documentation: Construction jobs require clear communication. Workers use site diaries, logbooks and signage to share information. Common tasks include:

- **Reading and Writing Reports:** E.g. completing incident reports, daily activity logs, or shift handover notes. Accuracy and clarity are key.
- **Signals and Signs:** Recognize standard safety and instructional signs (e.g. “No Entry”, “Hard Hat Area”, hazard symbols). Use hand signals or radios when operating machinery.

Teamwork and Professionalism: Success on site depends on cooperation. This means:

- Arriving on time, in full PPE, and following the supervisor’s instructions.
- Working respectfully with all team members. For example, check understanding (“listen and clarify”), and help fellow workers.
- Maintaining a clean workplace (housekeeping, proper tool storage) demonstrates pride and safety.

Planning & Coordination: Construction is staged work. Workers should understand:

- **Job Sequencing:** Tasks often follow a logical order (e.g. foundation → frame → services → finishes). Each trade knows when to step in.
- **Materials Management:** Deliveries should match the schedule to avoid delays or overcrowding. Waste and recyclables (e.g. timber offcuts, metal scrap) are sorted according to regulations.
- **Quality & Standards:** Finished work must meet project specifications and codes (dimensions, finishes, structural integrity). Inspectors or supervisors may check at each stage.

Legislation and Codes: Industry operations are governed by:

- **National Construction Code (NCC):** Mandatory building code (previously Building Code of Australia)

covering structure, fire, access, etc. All construction (residential, commercial) must comply.

- **Licensing Requirements:** Certain work (electrical, plumbing) must be done by licensed tradespeople under NSW law.
- **Environmental Regulations:** e.g. the Environment Protection Act controls waste disposal on sites; recycling is encouraged by council requirements.

Workplace Induction (White Card): Every worker must complete a General Construction Induction (White Card) before site work ⁶. This six-hour course covers basic safety and legislation. Employers must verify induction; untrained workers are not allowed on construction sites ⁶.

Example Scenario: "A delivery of timber arrives at a busy site. Outline the steps you would take to safely store the materials and inform your team."

Guidance: First, check the material matches the delivery note. Unload and stack the timber neatly in the designated lumber area, clear of walkways and hazards. Notify the site supervisor or team (e.g. via radio or note) that the timber is on-site. Tag or mark the stack with identification (e.g. "Floor joists for building A"), and ensure others know where it is stored. This communication prevents delays and accidents.

Glossary (Industry):

- **White Card:** Proof of completion of the construction induction course (mandatory for all workers) ⁶.
- **NCC (National Construction Code):** Australian building code that all new construction must comply with.
- **Site Diary:** Daily log of events, weather, and significant occurrences kept by site management.
- **Standards:** Published documents (e.g. AS/NZS) that prescribe technical requirements; often referenced in contracts.
- **RTO (Registered Training Organization):** Accredited body that delivers vocational training and issues certificates.

Legislation & Standards:

- *Work Health and Safety Act 2011 (NSW):* Applies to all construction workplaces and requires site safety compliance.
- *Australian Standards (AS):* e.g. AS 1319 (safety signs), AS 1657 (fixed platforms), AS 4100 (steel structures).
- *National Construction Code (NCC):* Mandatory national building rules.
- *Local Government Codes:* e.g. waste disposal guidelines, environmental protection requirements.

¹ ² ³ ⁴ ⁵ ⁷ ⁸ ⁹ ¹⁰ education.nsw.gov.au

<https://education.nsw.gov.au/content/dam/main-education/teaching-and-learning/curriculum/vocational-education-and-training/SIRXCEG001-engage-the-customer-retail-mandatory-focus-area-customer-service.pdf>

⁶ HSC 2023

https://lucasheigh-h.schools.nsw.gov.au/content/dam/doe/sws/schools/l/lucasheigh-h/documents/assessment-guidelines/2024/HSC_2024_Assessment_Guidelines_Handbook_FINAL.pdf