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# Using Construction and Carpentry Hand Tools

Each hand tool has specific uses, safety precautions, and limitations. Always use tools for their intended purpose and follow all safety guidelines. Below is a list of common construction and carpentry hand tools with their uses, safety measures, and limitations:

* + Retractable Tape Measure
  + *Uses:* Used for measuring lengths up to 8 metres.
  + *Safety:* Retract slowly to avoid hand injuries.
  + *Limitations:* Only measures up to the length on the tape (e.g. 8 m).
  + Folding or Steel Rule
  + *Uses:* Used for measuring distances and ruling straight lines.
  + *Safety:* Take care with sharp edge. Do not use as a screwdriver.
  + *Limitations:* Only used for measuring small distances.
  + Combination Square
  + *Uses:* Used for checking 90° angles, measuring 45° angles, finding the centre of a circular object, and measuring depth and distance.
  + *Safety:* Avoid pinch points and sharp edges.
  + *Limitations:* For marking and testing angles on small sections of timber only.
  + Builder’s Square
  + *Uses:* Used for marking out and testing 90° angles (checking large right angles).
  + *Safety:* Handle carefully to avoid injuries to feet if dropped.
  + *Limitations:* Not suitable for checking very large-scale right angles.
  + Spirit Level
  + *Uses:* Used to check horizontal or vertical (plumb) levels.
  + *Safety:* Reduce risk of glass breakage to minimize puncture injuries.
  + *Limitations:* Transferring level over long distances is easier with other devices.
  + String Line
  + *Uses:* Used to create a straight line between two reference points.
  + *Safety:* Plan the path of the line to avoid it becoming a trip hazard.
  + *Limitations:* String length is the only distance it can cover; cannot mark curves.
  + Chalk Line
  + *Uses:* Used to mark straight lines on flat surfaces.
  + *Safety:* Wear appropriate PPE to avoid getting chalk dust in eyes or airways.
  + *Limitations:* Cannot mark curves.
  + Hand Saw
  + *Uses:* Used for cutting timber to length by hand.
  + *Safety:* Apply minimal pressure to avoid the blade snapping. Keep hands behind the cutting edge.
  + *Limitations:* Slow compared to a power saw; the saw’s teeth are difficult to sharpen. Not very effective for very straight long cuts without a guide.
  + Coping Saw
  + *Uses:* Used for cutting curves in timber and plywood.
  + *Safety:* Keep hands away from sharp edges and points. Apply minimal pressure to avoid blade snapping.
  + *Limitations:* Cutting thick timber can buckle or break the blade. Slower than powered options and requires frequent blade replacement/sharpening.
  + Claw Hammer
  + *Uses:* Used for driving and removing nails.
  + *Safety:* Ensure the hammer’s handle is secure and keep fingers clear from the point of impact. Wear eye protection if needed (striking metal on metal).
  + *Limitations:* Can cause damage from impact if misused. May require different sizes for different applications.
  + Chisel
  + *Uses:* Used for removing timber when cutting joints or shaping wood.
  + *Safety:* Keep hands behind the cutting edge. Test sharpness on scrap wood, not with your fingers. Secure the workpiece before chiseling.
  + *Limitations:* May need sharpening often for effective use. Using a chisel is slower than using a power tool for material removal.
  + Tin Snips
  + *Uses:* Used to cut and trim sheet metal.
  + *Safety:* Keep hands away from sharp edges. Ensure the tool’s pivot and handles are secure.
  + *Limitations:* Can only cut relatively thin sheet materials; cutting very thick metal can damage the snips’ cutting mechanism.
  + Hand Plane
  + *Uses:* Used to reduce the thickness of timber or to smooth the surface of timber.
  + *Safety:* Secure the timber workpiece in a clamping device before planing. Keep fingers clear of the blade.
  + *Limitations:* Slower than power planers. Limited to the width of the plane’s blade for each pass. Requires consistent blade sharpening for effective use.
  + Trimming Knife (Utility Knife)
  + *Uses:* A utility knife used for cutting a variety of thin materials (e.g., plasterboard, plastic, carpet).
  + *Safety:* Do not place fingers in front of the blade. Always keep hands and body parts clear of the cutting path. Use a sharp blade (dull blades require more force and can slip).
  + *Limitations:* Only suitable for cutting relatively soft or thin materials. Blades can snap under excessive force and require regular replacement.
  + Clamps
  + *Uses:* Quick-release clamps are used for holding a workpiece securely in place to enable accurate work.
  + *Safety:* Avoid pinch points when tightening clamps. Ensure the clamp is secured properly before putting pressure on the workpiece.
  + *Limitations:* May need multiple sizes or types of clamps for various jobs. Clamps only hold; they do not replace structural support.
  + Sliding Bevel
  + *Uses:* Used to set and repeat markings of various angles (transfers a set angle from one piece to another).
  + *Safety:* Avoid pinch points when locking the bevel. Keep hands away from the tool’s edges.
  + *Limitations:* Designed for marking and measuring angles on small sections of timber, not for large sheets or long distances.
  + Shovel/Spade
  + *Uses:* Used to move materials such as dirt or sand (shoveling from a pile into a barrow) or for digging holes in the ground.
  + *Safety:* Use correct manual handling techniques when shoveling. “Dial Before You Dig” (check for underground services) before digging. Wear appropriate foot protection (boots), as this is a heavy tool.
  + *Limitations:* Much slower than mechanical options for moving large volumes or digging in hard soil. Cannot transport soil long distances, only loosen and lift it.
  + Mattock
  + *Uses:* A mattock is used for digging, prying, and chopping – for breaking up hard ground, rocks, or removing tree roots (similar to a pickaxe, with a broad blade).
  + *Safety:* Use correct manual handling techniques due to the tool’s heavy weight. Beware of people or objects nearby when swinging this tool. Wear foot protection in case you drop it.
  + *Limitations:* Does not actually transport soil (it just loosens it). It is slower and more tiring compared to using mechanical equipment for large jobs or very hard soil.
  + Crow Bar / Fencing Bar
  + *Uses:* Used for heavy duty prying or demolition work (e.g. lifting objects, removing nails or prying apart materials, digging post holes with a fencing bar).
  + *Safety:* “Dial Before You Dig” when breaking ground to avoid underground hazards. Use correct manual handling techniques—this is a long, heavy tool, so wear correct foot protection and maintain a stable footing.
  + *Limitations:* Requires repetitive actions and strength due to a small leverage point or cutting edge. Using a crowbar can be slow for large tasks that could be done with powered equipment.

*(Always ensure hand tools are in good condition: blades sharp, handles secure, etc., before use. Damaged tools should not be used.)*

# Using Construction and Carpentry Power Tools

Power tools must be used with proper safety measures due to their increased risk. Below are common power tools, their uses, the safety precautions to take, and their limitations:

* + Bench Grinder
  + *Uses:* Used for sharpening chisels and drill bits, or grinding and shaping metal.
  + *Safety:* Wear eye and ear protection at all times. Keep hands at a safe distance from the grinding wheel to avoid abrasions or injury. Ensure the tool rests and shields are properly adjusted and secure before use.
  + *Limitations:* For precise or accurate work, the workpiece often needs to be held with a jig or guide to maintain the correct angle. Bench grinders are stationary and limited to grinding tasks (not cutting).
  + Circular Saw
  + *Uses:* Used for making straight cuts on timber or plywood (cross-cutting and ripping lumber).
  + *Safety:* Ensure no electrical cords are in the cutting path or dangling where the blade could contact them. Clamp the workpiece securely before cutting. Keep fingers and body parts clear of the rotating blade. Tie back long hair and secure loose clothing before use. Always wear eye and ear protection when cutting.
  + *Limitations:* A circular saw cannot cut curved lines. To make accurate straight cuts, especially long ones, it should be guided by a straight edge or fence. It also has a limited cutting depth and width based on the blade size.
  + Reciprocating Saw (Sabre Saw)
  + *Uses:* Commonly used for demolition and remodeling work. Can cut a variety of materials such as wood, metal, PVC pipes, and nails (using appropriate blades).
  + *Safety:* Keep electrical cords well away from the moving blade to prevent cutting the cord. Maintain a firm grip and keep fingers clear of the blade and its path. Wear eye and ear protection due to flying debris and noise.
  + *Limitations:* Can be difficult to control precisely, especially for clean or straight cuts due to blade vibration. Plunge cuts (starting a cut in the middle of material without an edge) are not possible without drilling a starter hole first. Cuts must typically start from an edge or a pre-drilled hole. The blade may bend or wander, so it’s not ideal for highly accurate straight cuts.
  + Sliding Compound Mitre Saw
  + *Uses:* Used for cutting timber to length at various angles (adjustable for crosscuts and mitre cuts, typically from 90° straight cuts up to 45° angles or more). Often used for precise angle cuts on trim, framing, etc.
  + *Safety:* Keep hands and fingers clear of the blade, especially when bringing the saw down to cut. Secure timber with the saw’s clamp or an external clamp before cutting. Use the saw’s dust collection or suppression system if available, and wear a dust mask, as well as eye and ear protection. Tie back hair and remove loose clothing or jewelry.
  + *Limitations:* It can only cut straight lines (no curved cuts) and is limited by the diameter of the blade – it has a maximum cut width and depth. Very large or wide pieces of timber may not be fully cut in one pass. For long accurate cuts, other tools (e.g. table saw) may be needed.
  + Jigsaw
  + *Uses:* Used for making curved or intricate cuts in timber, plywood, or other sheet materials. Suitable for cutting shapes, holes, or non-straight lines.
  + *Safety:* Check the tool’s cord for damage before use. Ensure the workpiece is free of obstructions and that no electrical cords are underneath the material being cut. Clamp the workpiece securely to

prevent movement. Check that the jigsaw blade is properly installed and tight. Keep fingers away from the blade and the bottom of the saw. Wear eye protection to guard against sawdust and chips, and hearing protection if needed.

* + *Limitations:* Jigsaws are not very accurate for long straight cuts, as the blade can flex or wander, resulting in a cut that isn’t perfectly square or straight. The blades may bend when cutting thick material or tight curves, and they can break if forced. Cutting is slower than using larger saws for straight cuts.
  + Angle Grinder
  + *Uses:* Used for cutting and grinding metal or masonry materials when fitted with the appropriate special-purpose disc (e.g. cutting steel pipes, grinding welds, cutting concrete or ceramic tiles with a masonry disc).
  + *Safety:* Check the grinder’s electrical cord for any damage and ensure it has a current test tag. Make sure the correct disc is securely attached and in good condition (not cracked). Keep fingers and hands clear of the spinning disc and away from any hot surfaces or sparks generated. Wear eye protection (a full face shield is recommended due to sparks and debris), ear protection, and gloves. Secure the workpiece if possible so it doesn’t shift. Beware of sparks and ensure no flammable materials are nearby.
  + *Limitations:* Only straight or fairly straight cuts can be achieved; it cannot make precise curved cuts. Discs are specific to the material and purpose (e.g. metal cutting disc vs. grinding disc) – you must use the correct disc for the job. Discs also wear down or may shatter with heavy use, and may need frequent replacement during vigorous work.
  + Portable Power Plane
  + *Uses:* Used for quickly shaving off thin layers of timber to level or smooth a surface (e.g. planing the edge of a door or leveling framing timber).
  + *Safety:* Always check the power cord and plug for damage before use. Ensure the blade (planer knives) is securely installed and sharp. Clamp the workpiece firmly, or secure the material so it cannot move while planing. Keep fingers and hands away from the bottom of the planer and blade area. Unplug the tool before adjusting or changing blades. Wear eye and ear protection, and use dust extraction or a mask to avoid inhaling wood shavings.
  + *Limitations:* Portable power planers have a limited width cut determined by the blade width, so wide boards may need multiple passes or a larger machine (such as a bench planer). They are meant for removing relatively small amounts of material; taking off too much at once can strain the tool or damage the wood.
  + Cordless Drill (Battery Drill)
  + *Uses:* Used for general-purpose drilling of holes and driving screws in various materials (wood, metal, plastic, with appropriate bits). Versatile for many construction tasks.
  + *Safety:* Make sure the correct drill or driver bit is securely tightened in the chuck. Keep fingers clear of the rotating bit and avoid loose clothing or hair that could get caught. When drilling, hold the drill

with two hands if possible and keep a balanced stance. Wear eye protection to guard against flying debris. If drilling overhead or into materials that create dust, wear a dust mask.

* + *Limitations:* Cordless drills can sometimes “kick back” or twist forcefully if a drill bit binds in the material, especially when using high torque or large bits, so a firm grip is needed. They also have limited power and battery life compared to corded tools; very heavy drilling work or large holes may strain the drill or drain batteries quickly.
  + Rotary Hammer Drill
  + *Uses:* Used for heavy-duty masonry work, such as drilling into concrete or brick, and for light demolition (chipping) if it has a hammer function. It delivers a hammering action that regular drills do not, making it effective for concrete and stone.
  + *Safety:* Check the cord for any damage or exposed wires before use (ensure it’s tagged if required). Before drilling into walls or slabs, check for electrical cables or pipes hidden behind or inside the material (“Dial Before You Dig” or use a detector) to avoid drilling into services. Ensure the correct SDS drill bit is securely inserted and locked. Keep fingers and body parts away from the bit and wear gloves to reduce vibration effects. Wear eye protection for flying concrete dust and ear protection because these tools are loud. Use dust suppression or extraction if available, and a dust mask for concrete dust.
  + *Limitations:* Rotary hammer drills often require specific types of bits (SDS bits) for different tasks, and you must have the right size/type for the job – they are not as universally adaptable to standard bits without an adapter. They are heavier than regular drills and can be cumbersome for small jobs. Not suitable for precise fine drilling in wood or metal (they are designed for masonry).
  + Impact Driver
  + *Uses:* Used for driving screws, bolts, and fasteners that require higher torque than a normal drill can provide (excellent for long screws or coach screws in timber, and for loosening/tightening nuts with the proper attachment).
  + *Safety:* Use the correct impact-rated driver bit and ensure it is secured in the chuck. Clamp or securely hold the workpiece when driving screws to prevent it from spinning or moving. Keep hands clear of the bit and the fastener. Be aware that an impact driver produces sudden high torque impacts – hold it firmly to prevent slipping. Also be cautious of metal shards or wood splinters when driving; wear eye protection. Be mindful that screws can heat up; avoid touching a fastener immediately after driving it and beware of any hot metal fragments. Hearing protection is recommended as impact drivers can be loud.
  + *Limitations:* Impact drivers have no adjustable clutch and a very high torque, so without careful use they can overdrive or snap smaller screws and fasteners. They are not typically used for drilling holes (unless equipped with special drill bits) because of the lack of precise torque control and the impact action.

*(Always disconnect power (unplug or remove battery) before changing blades or bits on power tools. Use the right blade or bit for the material. Allow moving parts to come to a stop before setting the tool down.)*

# Manual and Mechanical Handling of Carpentry Materials

Proper handling of materials on site is crucial for safety and efficiency. This includes both manual handling (by hand or with hand tools) and mechanical handling (using equipment or machinery to assist). Below are guidelines for safely handling, moving, and storing various carpentry materials and the equipment that can assist with these tasks:

## Material Handling Equipment and Their Uses

* + Pallet: An Australian Standard flat platform (usually hardwood or sturdy plastic) used to stack and support materials for mechanical handling with forklifts or pallet jacks. Pallets keep materials organized and off the ground, allowing heavy loads to be moved easily with machinery.
  + Pinch Bar: A long steel pry bar used for heavy-duty prying or demolition work. (Also known as a crowbar or pinch point bar.) It can be levered under heavy objects or materials to lift and reposition them manually.
  + Wheelbarrow: A versatile one-wheeled cart used for manual material transport. A wheelbarrow distributes the weight of its load between the wheel and the operator, allowing heavy or bulky materials (like concrete, soil, bricks) to be moved around the site with less strain. It is ideal for loads that can be handled by one person.

*(Use the appropriate device for the material and task: e.g., use a wheelbarrow for loose materials like sand or concrete, and a pallet with a pallet jack or forklift for heavy, palletized loads. A pinch bar can assist in prying up or moving objects that are too heavy to lift directly.)*

## Safe Handling, Stacking, and Storage of Materials

For each type of material, follow safe handling procedures, use mechanical aids when possible, and prepare the load and area before moving it.

Cement Bags (bagged cement or other powdery materials like lime or plaster in bags)

* Handling/Stacking: Bags must be kept dry to prevent the contents from setting or clumping. Stack bags in an alternating (cross-hatched) pattern to make a stable stack that won’t tip – usually no more than 10 high. Lift one bag at a time to avoid excessive strain; if bags are heavy (20–25kg each), consider a two- person lift for each bag to reduce the risk of injury.
* Mechanical Aids: Store and move bags on a pallet. A pallet jack or forklift can be used to transport

stacked pallets of cement bags, rather than carrying them by hand over distances.

* Preparation/Other Tips: Plan the path and final stack location before moving the bags. Ensure the storage area is dry and flat. Clear any obstructions or trip hazards along the route. Keep bags off any damp ground by using pallets or plastic sheeting.

Insulation (batts or rolls of insulation material, which are lightweight but bulky)

* Handling/Stacking: Stack insulation batts or rolls in an alternating pattern if they are in bags or bundles, to increase stability. These materials are lightweight, so manual handling is easier, but they are often large – use team lifting if needed to handle bulky rolls.
* Mechanical Aids: Use a pallet for stacking if available. Wrap the stack with plastic wrap or secure the insulation to the pallet with straps before transport so it doesn’t fall apart or catch the wind (insulation is very light). A trolley or pallet jack can then move the pallet.
* Preparation/Other Tips: Wear appropriate PPE when handling insulation, such as gloves (many

insulation materials can irritate skin) and respiratory protection (dust mask) to avoid inhaling fibers. Plan how you will contain the insulation during transport so it doesn’t scatter. Keep it dry (most insulation should be kept dry and covered).

Paints and Sealants (cans, buckets, or tubes of paint, sealant, adhesives, etc., including other chemicals)

* Handling/Storage: These must be stored in a chemical cabinet or designated flammable liquids cabinet if flammable, according to safety guidelines. Keep them away from any source of heat or flame and out of direct sunlight (heat can cause expansion or combustion of chemical products). Ensure lids are tightly closed to avoid spills and evaporation of fumes. Always store chemicals upright and never in locations where they might get knocked over or damaged.
* Mechanical Aids: Use a trolley or a wheelbarrow to transport multiple paint cans or containers to reduce

carrying strain. Secure them so they don’t tip off the trolley. If transporting many at once, boxes or a wrapped pallet can be used to keep them together.

* Preparation/Other Tips: Before moving chemicals, check that all lids are secure and not leaking. It’s often

useful to transport cans in their original cardboard cartons or on a tray to contain any accidental leak. Refer to the Safety Data Sheet (SDS) for each product for specific handling and storage instructions (including required PPE). For example, some paints/sealants may require storage away from direct sunlight or at a

certain temperature range.

## Safe Manual Handling, Aids, and Preparation for Various Materials

Joinery Units (e.g. pre-made cabinets, doors, window frames, or similar bulky carpentry assemblies)

* Handling/Stacking: These are bulky objects. Use a two-person lift for heavy or awkward items – practice safe team lifting techniques (coordinate the lift, keep back straight, lift with legs). Keep joinery units dry to prevent swelling or warping of timber components. When stacking (if multiple units), do not stack too high and use padding to avoid damage.
* Mechanical Aids: A pallet jack or a furniture trolley can be used to move joinery units around if they are

strapped or placed on a pallet. Use moving straps or dollies for large pieces like doors or cabinets.

* Preparation/Other Tips: Before moving, secure any loose parts (for example, tape drawers or doors shut on cabinets so they don’t swing open). Plan your route – ensure doorways or paths are clear and wide enough. Protect finished surfaces of the joinery with moving blankets or cardboard when transporting.

Metal Sheeting (e.g. roofing iron, metal cladding sheets)

* Handling/Stacking: Large metal sheets often require two people to carry to prevent bending and to handle the size (especially long roofing sheets). When stacking, place the largest (or longest) sheets at the bottom and stack progressively smaller sheets on top to keep the stack stable. Keep the sheets dry to avoid corrosion. Wear riggers gloves (heavy-duty gloves) when handling metal sheets to protect against sharp edges.
* Mechanical Aids: Store sheets on a pallet or in a special sheet metal rack. A pallet jack or trolley can assist in moving a stack of sheets once secured. For large quantities, a crane with proper lifting clamps might be used to unload or move bundles of metal sheets.
* Preparation/Other Tips: Be aware of sharp edges. Banding straps or clamps should be used to keep

sheets together during transport. If using a crane or hoist, ensure sheets are securely strapped or use a

spreader bar to lift without bending them. Clear the path and have an area prepared to set them down, with supports (“dunnage”) or pallets on the ground to keep them off any damp ground.

Plaster or Fibre-Cement Sheeting (e.g. drywall sheets, fiber cement cladding sheets)

* Handling/Stacking: These sheets must be stacked flat and aligned neatly to prevent warping or breakage. Two-person lifts are required for the larger sheets due to their weight and size (e.g. plasterboard often comes in large 2400mm x 1200mm sheets). When stacking, use supporting “spacers” or gluts (pieces of timber) under the stack to keep it flat and off the floor, and to allow forklift tines under if needed. Keep sheets dry and out of direct sunlight (especially important for plasterboard, which can degrade with moisture, and fibre cement, which can warp in heat if not flat).
* Mechanical Aids: These sheets are often delivered on a trailer or truck to the site. Use team lifts or panel lifter devices to carry them. For example, a sheet lifter trolley can help move them on site, and a drywall lift can assist in installation.
* Preparation/Other Tips: Plan your path and storage space in advance – these sheets are large and can

be difficult to maneuver around corners or through doorways. Ensure the storage area is close to where they will be used to minimize movement. When securing for transport or storage, take care to preserve the factory-cut edges and corners (use edge protectors or keep in original packaging) because damaged edges can make installation difficult.

Reconstituted Timber Products (e.g. Plywood, Particleboard, MDF sheets)

* Handling/Stacking: Like plaster sheets, stack largest sheets at the bottom and align edges. Use spacers to support sheets and allow forklift access. Space the supports appropriately (so sheets don’t sag). Consider a two-person carry for large or heavy sheets to avoid back strain – these boards can be very heavy (especially MDF). Keep these materials dry, as moisture can swell or damage them.
* Mechanical Aids: Store on a pallet for easy movement. A pallet jack or forklift can then move the stack.

For smaller quantities, a sheet trolley or cart can help move them around the site.

* Preparation/Other Tips: Secure the stack with straps prior to transport. This prevents sheets from sliding off. Note that melamine-coated boards (and other smooth finished boards) are very slippery – extra caution is needed as they “slide very easily.” Use friction mats or additional strapping to keep them in place. When carrying by hand, carry one sheet at a time (or use team lifting) and watch for sharp edges on cut sheets.

*(In all cases, plan the route and clear obstacles before moving materials. Use proper lifting techniques: keep your back straight, bend at the knees, and don’t twist while carrying. When in doubt, use more people or mechanical assistance to move heavy or awkward loads. Store materials as directed to prevent accidents (e.g. secure vertical stacks from tipping, label hazardous materials).)*

## Additional Mechanical Handling Tips

* + Use “Dial Before You Dig” or check plans before mechanically moving earth or digging (to avoid hitting underground utilities).
  + Use barricades or warning signage if moving materials across areas where others are working, to keep people at a safe distance.
  + Ensure proper storage locations are designated (e.g. racks for scaffold components often called “scaff racks,” storage bins for smaller items, etc.). Organizing storage not only makes work efficient but also prevents hazards like tripping or materials falling.

# Site Safety, Work Preparation and Clean-Up

Working safely on a construction site involves careful planning and preparation, ongoing attention to safety procedures, and thorough clean-up after the work is done. Below are key practices for site safety, work preparation, and post-work clean-up:

* + Plan and Inspect the Worksite (WHS Compliance): Before starting work, perform a site inspection and identify any hazards. Complete a Job Safety Analysis ( JSA) or similar risk assessment for the tasks, including the use of tools, equipment, and handling of materials. Apply all required hazard controls. For example:
  + Read and follow the Safe Operating Procedures (SOPs) and the manufacturer’s operator manuals for any tools or machinery you will use (including completing any pre-operational checklists).
  + Check all electrical cords and equipment for current test tags and any damage (exposed wires, defects). Do not use damaged equipment – tag it out and report it.
  + If using power tools or machinery, ensure all guards are in place and functional. Keep hands away from moving or sharp parts; use push sticks or guides where appropriate.
  + Use dust extraction systems or wet-cut methods to control dust (especially for concrete, timber dust, or fiber cement).
  + Use correct manual handling techniques for lifting or moving materials (bend your knees, keep your back straight, etc.).
  + Set up barricades or warning signs when transporting materials or when performing hazardous

activities (e.g., exclude people from a lifting zone or cutting area).

* + Ensure the work area is adequately lit and ventilated. If working at heights, secure ladders or use proper scaffolding and fall protection as required.
  + Review Work Instructions and Plans: Before and during the task, always refer to the relevant instructions and plans to ensure work is done correctly and safely. This may include:
  + Teacher’s or supervisor’s instructions specific to the task or project.
  + A Job Safety Analysis ( JSA) document that outlines step-by-step safety measures.
  + Project plans or drawings that show how the work should be done (so you don’t make errors that could create hazards later).
  + A project schedule or Gantt chart to understand the sequence of tasks and avoid conflicts (for

example, not having multiple trades working in the same area unsafely).

* + Machine and equipment Safe Operating Procedures (SOPs) – read these fully for any equipment you will operate.
  + Equipment or machinery Operator’s Manuals – follow the manufacturer’s guidelines for safe operation, maintenance, and limitations of the equipment.
  + Use Personal Protective Equipment (PPE) Properly: Always wear the required PPE for the job and work environment. Select the correct PPE, ensure it fits properly, and use it as instructed. Common PPE in construction includes safety boots, hard hat, high-visibility clothing, safety glasses or face shield, hearing protection (ear muffs/plugs), gloves, and dust masks or respirators. For example, when cutting or grinding, eye and ear protection are mandatory; when handling fibrous materials, wear gloves and a dust mask. After work, store PPE correctly in a clean, dry place so it remains

effective (for instance, keep respirators in a sealed bag, don’t leave PPE on the floor or in direct sun, etc.). Replace any PPE that is damaged or excessively worn. *(Remember: PPE is the last line of defense – it does not replace safe work procedures, but it greatly reduces injury if something goes wrong.)*

* + Maintain a Clean and Safe Work Area: Good housekeeping is a vital part of site safety both during and after tasks. Throughout the work: keep the area as neat as possible, and after completing the task, clean up the work site to meet workplace and environmental requirements. This includes:
  + Safely disposing of or removing waste materials. For example, sweep the floor to remove sawdust, wood offcuts, or debris immediately after cutting or framing work. Use a broom or industrial vacuum for fine dust.
  + Collect and place waste (e.g. sawdust, timber offcuts, packaging) into the proper bins or waste containers. Separate general waste from recycling if required (e.g., timber offcuts may go in green waste or recycling, chemical waste in hazardous waste containers, etc.).
  + Keep walkways and access paths clear of obstructions. Do not leave tools, cords, or materials scattered where someone could trip. Roll up or recoil extension leads when not in use.
  + Clean up any spills (oil, paint, solvents, water) immediately using appropriate methods (spill kit, absorbent materials) to prevent slip hazards and environmental contamination.
  + If working outside, secure any light materials or debris so they do not blow away (which can litter the site and environment). Cover skips or bins if necessary to prevent dust.
  + Maintain environmental standards by ensuring noise, dust, and waste are controlled. For example, avoid generating excessive dust or noise at times not allowed by local rules, and ensure waste water or materials do not run off into storm drains.
  + Check and Store Tools and Equipment After Use: When finishing work, always check the condition of tools and equipment and then store them properly. Specifically:
  + Inspect tools for any damage, wear, or faults. For example, check power tools for loose parts, damaged cords, or dull blades. Check hand tools for cracks or chips.
  + Report any faulty or damaged tools/equipment to the teacher or supervisor immediately. Faulty

equipment should be tagged “Out of Service” so no one else uses it until it’s repaired or replaced.

* + Clean tools if needed (remove sawdust, oil residues, etc.) and perform basic maintenance (for instance, wipe down metal parts to prevent rust, oil moving parts if required, etc.).
  + Store tools and equipment in their designated storage areas. Return all tools to the toolbox, rack, or cabinet where they belong. For example, hang hand tools on the shadow board or pegboard, lock up power tools in the storage cage, and park any machinery in its proper place. Ensure tools are stored safely (sharp edges guarded, power cords coiled, nothing stored in a way that it can fall). Secure the storage area if necessary (lock sheds or containers).
  + Hazardous Materials and SDS: Be aware of all hazardous substances on site (paints, adhesives, cleaning chemicals, etc.). Know where to find the Safety Data Sheet (SDS) for each hazardous material – these are typically kept in a folder or online database accessible to workers. The SDS provides crucial information on safe use, handling, and storage, as well as first aid measures in case of an accident. Always follow the SDS guidelines (for example, required ventilation, specific PPE like respirators or chemical-resistant gloves, and storage incompatibilities). For instance, if you are using

a solvent-based sealant, the SDS will tell you to use it in a well-ventilated area and to wear appropriate gloves, and to store it in a flammable liquids cabinet away from sparks or heat.

*(By adhering to these safety and preparation steps, you help ensure a safe working environment for yourself and others. A well-planned job and a clean, safe site reduce the risk of accidents and help the project run smoothly.)*

# Practical Use of Hand Tools

Developing practical skills with hand tools is essential. Students are expected to select the appropriate hand tool for each task and use it safely and effectively. This means applying the knowledge of which tool to use (from Module 1) and the correct method of using it as practiced in class. Key points for the practical use of hand tools include:

* + Use each required hand tool at least once across your projects: Over the course of at least three practical tasks or projects, you will need to demonstrate the ability to safely and effectively use *all* of the common hand tools in the toolkit. This includes measuring and marking tools (tape measures, rules, squares, chalk lines), cutting tools (hand saws, coping saws, tin snips, knives), striking tools (hammers, mallets), boring tools (hand drill or brace if applicable), and others like chisels, planes, clamps, shovels, mattocks, crowbars, etc. Ensure you get hands-on practice with each tool in a controlled and correct manner. *(Your instructor may set specific tasks to make sure you use each tool.)*
  + Follow all WHS requirements and manufacturers’ recommendations when using hand tools: Even though hand tools are manually operated, they can still cause injuries if used improperly. Always use the correct personal protective equipment (e.g., wear safety glasses when chiseling or hammering in case of flying chips). Use each tool only for its intended purpose and within its limitations – for example, do not use a screwdriver as a chisel or a chisel as a screwdriver, and do not hammer on a tool not meant for striking. Keep hands and body parts out of the line of fire (for instance, when chiseling or cutting, position your body and supporting hand so that if the tool slips, it won’t hit you). If a tool has a manufacturer’s guideline (like a maximum torque for a hand wrench or specific sharpening angle for a plane blade), follow those instructions.
  + Apply proper technique as demonstrated: For each hand tool, there is a correct way to hold and use it. During practical sessions, pay attention to your teacher’s demonstrations and feedback on technique. For example, when using a hand saw, start the cut with a gentle draw action to create a notch, then use long, even strokes without excessive force. When using a chisel, ensure the material is secured and cut away from yourself, tapping the chisel with controlled strikes of a mallet. Using clamps, ensure they are tight but not over-tightened to avoid damaging the material. These techniques help you work efficiently and safely, and also produce quality workmanship.
  + Tool maintenance during use: Part of practical use is keeping your tools in good working order. If a hand tool becomes dull or damaged during use (for example, a saw blade dulls, or a chisel edge chips), stop and address the issue – sharpen the tool or inform the instructor if a replacement is needed. Do not force a dull tool to work, as this often leads to accidents. Wipe down tools after use, especially cutting edges, to keep them clean for the next use.
  + Work efficiently and safely: Plan your work when using hand tools just as you would with power tools. Use measuring and marking tools to mark out cuts accurately *before* cutting – “measure twice, cut once.” Secure your workpiece with clamps or a vise so it doesn’t slip. Be mindful of the people around you; maintain a safe distance so that, for instance, if you are swinging a hammer or mattock, no one is in range of the swing. Communicate with your teammates when you are about to do something that might affect them (like hammering or prying, to avoid surprise movements).

By practicing with hand tools under these guidelines, you will build competence and confidence. The goal is to be able to independently perform all necessary tasks using the correct hand tools, in a safe manner and to the required standard of workmanship.

*(Remember: proficiency with hand tools is a foundational skill in construction. It trains you to work with precision and care, which will also benefit your use of power tools.)*

# Practical Use of Power Tools

Power tools require skill and caution. In your practical projects, you must demonstrate that you can safely select and use each required power tool effectively. Over the span of at least three practical tasks, ensure that you have operated all the common power tools relevant to your course (as covered in Module 2) at least once under supervision. Key considerations for the practical use of power tools include:

* + Choose the right power tool for the task: Assess the job and decide which power tool is appropriate. For example, use a circular saw for straight cuts in plywood, a jigsaw for curved cuts, a drill or impact driver for making holes and driving screws, an angle grinder for cutting metal or grinding welds, and so on. Using the correct tool not only makes the job easier but also safer. If unsure, consult your instructor or refer to the task guidelines.
  + Safety first – every time: Before using any power tool, perform safety checks (is the tool in good condition? Are blades/bits securely installed? Is the cord free of damage and out of the way?). Follow all WHS (Work Health and Safety) requirements and the tool’s operating instructions each time you use it. This means wearing the required PPE (eye protection, hearing protection, dust mask, gloves as appropriate) and checking that all guards and safety features are in place (for instance, the blade guard on a circular saw must move freely and cover the blade when not cutting, the dead-man switch on a grinder should function, etc.). Only use power tools on appropriate power sources (correct voltage, and use a Residual Current Device (RCD) for corded tools).
  + Operate power tools correctly: Use the stance and technique you have been taught for each tool. For example, when using a drill, hold it with two hands and perpendicular to the workpiece; let the drill reach full speed before contacting the material. When using an angle grinder, hold it firmly with both hands, and never force the disc – let the tool do the work. With saws, keep your body to the side of the cutting line, not directly behind the blade, and support the material so the off-cut does not pinch the blade. If using extension leads, keep them clear of where you are cutting or drilling. Always stay alert and focused when a power tool is running – do not get distracted.
  + Maintain control and awareness: Many power tools have kickback or high torque. Be prepared for this – for instance, brace yourself when using a powerful drill in case the bit sticks. Keep aware of the

tool’s cord at all times (for corded tools) to ensure it doesn’t become entangled or cut. Only use one tool at a time and make sure others are clear of your work area; power tools can eject material at high speed, so a safe perimeter is necessary. Unplug or remove the battery from tools before changing blades, bits, or making adjustments. Never leave a running tool unattended, and turn off tools (and unplug if corded) when not in use.

* + After use and between uses: Whenever you finish using a power tool (even temporarily), switch it off and wait for all moving parts to stop. For example, after a cut with a saw, keep the saw in position until the blade stops completely. Between uses, place tools down in a safe manner (so they won’t fall or start unintentionally). For pneumatic tools (like nail guns, if used), disconnect the air hose when not actively nailing. If a tool malfunctions or you notice something unusual (strange noise, burning smell, excessive vibration), stop using it immediately and inform your instructor – do not try to fix electrical tools yourself unless trained and authorized.

By practicing these steps, you demonstrate competence in using power tools under real job conditions. You will need to show that you can independently set up and use each tool safely, as well as handle any basic troubleshooting (like changing a dull blade, adjusting a guard, or selecting the right drill bit for the material). Mastery of power tool use greatly increases efficiency on the job site but always remember that safety and care come first.

*(Every time you use a power tool, imagine the safety checklist in your mind: PPE on? Tool inspected? Correct blade/ bit? Workpiece secured? Bystanders clear? If all yes, you may proceed.)*

# Tool Maintenance and Sharpening

Keeping tools well-maintained is a critical part of working in construction. Proper maintenance ensures that tools operate safely and effectively. This module covers routine tool maintenance tasks – including replacing parts like blades – and the proper method for sharpening cutting tools.

Common Tool Maintenance Tasks: After and between uses, tools should be maintained according to guidelines. Key maintenance activities include:

* + Replacing the blade of a circular saw when it becomes dull or damaged (using the correct blade type for the material and ensuring the saw is unplugged/battery removed before changing).
  + Replacing the blades in a powered planer (installing the new planer knives securely and setting them at the proper height).
  + Replacing the cutter bit in a router (using the correct collet and tightening it securely; only use sharp router bits).
  + Replacing the abrasive disc on an angle grinder when worn (checking the disc rating matches the grinder speed and the material being worked).
  + Cleaning and oiling hand tools as needed (for example, wiping down metal surfaces to prevent rust, oiling moving joints like scissor or snip pivots, tightening any loose screws or handles on tools).
  + Checking tool handles for splits or cracks and repairing or replacing them if needed (especially wooden handles on hammers or mattocks, which can be replaced).
  + Grinding and sharpening cutting tools: Periodically, hand tools like chisels and plane blades

require grinding and honing to restore a sharp edge. This is a vital skill to keep tools efficient.

Sharpening Planes and Chisels (Grinding and Honing):

*The sharpening of hand plane blades and chisels involves two main stages: grinding and honing.* The sharpening process begins on either a traditional bench grinder or a wet stone grinder. These edge tools are ground to standard angles. Plane blades are ground to 25° and chisels are ground to 30°.

Then, on a sharpening stone (either a water stone or an oilstone), flatten the back of the blade by holding the back of the blade completely flat on the stone and sliding it back and forth. Turn the blade over, tilt the blade until the bevel is flat on the stone, then lift slightly past this point and move the tool back and forth, making sure to hold the tool at the same angle. This is the process of honing the edge to an angle 5° more than the grinding angle. This sharpens the tool to a keen edge.

After honing, the very edge of the blade should have a mirror finish and be razor sharp. Always test the sharpness safely (for instance, on a scrap piece of wood or by gently shaving a thin sliver of wood; do not run your finger along the edge). A properly sharpened plane blade or chisel will cut wood cleanly and with less force. Finally, wipe the blade clean and lightly oil it to prevent rust before storing the tool.

Maintaining Power Tools: In addition to hand tool maintenance, keep power tools in good condition:

* Regularly check brushes in drills or grinders (if they have carbon brushes) and replace them when worn.
* Keep ventilation slots on power tools clean of dust to prevent overheating.
* For battery-powered tools, keep batteries charged and do not drop them or expose them to extreme heat/ cold.
* Store tools in a dry place and in their cases if provided.
* Always follow manufacturer maintenance schedules (some tools may require professional servicing after certain hours of use).

By performing these maintenance and sharpening tasks, you extend the life of your tools and ensure they are ready for use when you need them. Sharp, well-maintained tools make your work easier and produce higher quality results. Moreover, using a dull tool can be dangerous – it often requires excessive force and can slip. Thus, part of working independently is knowing when and how to maintain your tools.

*(Take pride in your tools – a tradesperson’s tools in good condition reflect professionalism. Always allocate time for maintenance as part of your workflow.)*