Hazard Profile for Demolition

Developed by Demolishers and the WorkCover Construction Industry SafeWork 2000 project.

	Use the Profile as a guide to help:
	identify hazards and the necessary controls required for each of your job tasks;
University of New South Wales	fill in safety documentation
School of Safety Science	guide, or induct, new workers in the typical hazards for your trade; and
Building Research Centre	check that all general trade specific hazards have been identified in safety documentation required by the Principal Contractor

Hazard identification tool - Demolition			
Job Activity (Tasks)	**What Can Harm You (Hazards)**	**What Can Happen (Risks)**	**Causes Which Need to be Managed (Controlled)**
General Planning	Inadequate training, planning and improvisation.	Task specific injuries due to inexperience, or failure to provide appropriate equipment.	• Insufficient skills (competency) to complete the required task. • Inadequate competent supervision. • Planning for required equipment not carried out. • Improvisation using inappropriate equipment.
	Poor access.	Slips, trips and falls; abrasions, strains and sprains; manual handling injuries.	• Access to work area cluttered – poor housekeeping. • Area around work area cluttered with stored materials and/or rubbish. • Inadequate access for demolishers and their equipment.
	Insufficient lighting.	Slips, trips and falls; walk into objects.	• Poor lighting provided especially in basement areas. • Access ways not suitably defined or lighted.
	Lack of adequate ventilation.	Illness; overcome by fumes.	• Working in a confined space. • Intake for asbestos decontamination, or other chamber positioned too close to diesel or other fumes. • Petrol/ diesel driven equipment used.
	Working at height near edge.	Fall from the edge of a floor.	• Inadequate strength in perimeter handrail or midrail and fenderboard missing. • Gaps in perimeter protection, e.g. between screen or edge scaffold. • No catch scaffold provided.

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	Penetrations.	Fall through penetration.	• Penetrations not fenced or covered, or cover not secured forming “trap”.
	Uncontrolled collapse of structure or part of structure.	Serious injury to person/s.	• Poor planning of the demolition process. • Planning, including method of demolition not approved by the appropriate Authority.
	Noise from plant and equipment.	Hearing damage.	• No engineering solution for high noise level, e.g. quieter or muffled equipment. • No temporary sound absorption screen or barrier to protect other persons in the area. • No PPE or incorrect PPE worn for the required task.
	Sharp objects.	Cuts, lacerations, puncture wounds.	• No PPE or incorrect PPE worn for the required task.

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	Hazardous materials in structure.	Exposure to hazardous materials.	• Hazardous substances survey not conducted prior to commencement of work. • Detailed removal techniques not documented. • Specialized workers (licensed) not involved in removal or workers not inducted. • Hazardous materials not reported when detected. • Required precautions for removal, handling and disposal not followed. • Demolition techniques inappropriate for containment of hazardous material – scatter material over a wide area. • Other workers not prevented from entering areas where hazardous materials exist or are being removed. • No warning signs or signs insufficient. • Hazardous material left on site after completion of work. • Bagged materials not removed before damage to bag/s occurs.
	Dust and other fibres.	Inhalation, respiratory disease.	• No PPE or incorrect PPE worn for the required task.
	Exposure to Ultra Violet Light, glare.	Skin cancer; sunburn, eye damage.	• Personal protective clothing – sunscreen 15-30+, shirt, flap on hard hat not worn. • AS rated sunglasses not worn.

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Preliminaries Disconnect and/or decommission services	Electricity.	Electric shock, burns or electrocution.	• Licensed electrical contractor not used to switch off/isolate power. • On site labour do not treat all power circuits as live. • Pyro connection (fire backup for alarm) not identified, tagged and isolated. • Earth Leakage Switch not installed on mains supply or portable generator. • Other power source from outside the site not identified and disconnected. • Irregular unauthorized connections not identified and disconnected. • Temporary connections not identified, tagged and isolated.
	Gas.	Injury from explosion; severe burns from being caught in the explosion, or fire fighting a fire.	• Licensed Gas Plumber not used to isolate and switch off gas supply at source. • Residual vapour in mains not flushed with compressed air. • Workers attempt to fight a gas fire instead of notifying emergency services. • Leaks in pipes caused by heavy machinery loading. • Irregular unauthorized connections not identified and disconnected.
	Other volatile or explosive materials.	Injury from explosion; severe burns from being caught in the explosion or ~~fire or~~ fighting a fire.	• Insufficient identification and planning. • Dust ignition. • Chemical ignition. • Diesel/petroleum ignition. • Decommissioning of old chemical, or fuel tanks.

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	Fire.	Burns and/or smoke inhalation or asphyxiation.	• Short circuit. • Work area not cleared of combustible material prior to oxy cutting. • Stray spark from oxy or other. • Spotter" (additional worker) not used to watch for spot fires that may be caused by sparks from oxy cutting. • Material combustion. • Fire extinguisher not maintained or adjacent to work area. • Workers not trained in the use of fire fighting equipment.
Protection of the public and site personnel	Windborne dust and small particles.	Struck by dust or small particles. Eye injuries.	• Dust not wet down. • No regular clean ups and removal. • Safety glasses not worn. • Poor separation and/or public protection in areas, which are still accessible to the public. • Perimeter scaffold not adequately screened e.g. wire mesh and fire retardant material.
	Large falling debris or partial collapse.	Serious injury to persons.	• Poor separation and/or public protection in areas that are still accessible to the public. • Uncontrolled collapse of large members or other material. • Insufficient planning for lowering or control of large materials.

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	Collapse of a façade to be retained.	Serious injury to person/s.	• Insufficient planning by engineer/s or other responsible persons. • Planning does not allow for adverse weather – e.g. high winds. • Façade foundation undermined. • Façade supporting structure struck by plant. • Poor separation and/or public protection in area that are still accessible to the public.
	Scaffold collapse.	Serious injury to person/s.	• Competent person not used for scaffold erection up to 4 metres in height. • Certificated Scaffolder not used to erect scaffold in excess of 4 metres in height. • Foundation unstable. • Struck by plant. • Scaffold not tied in at specified intervals or some/all ties have been removed. • Wrong type of scaffold used – not heavy duty. • Scaffold overloaded beyond safe working limits. • Different scaffold systems mixed together.

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	Lifting loads by crane	Serious injury to person/s from falling material being lifted.	• Certificated Dogger or Crane Driver not used. • Individual loads not inspected and cleared before lifting commences. • Slings not regularly inspected and tested. • Load not slung correctly. • Sling capacity overloaded. • Load strikes object, e.g. structure, when lifting or lowering. • Communication error between Dogger and Crane Driver. • Foundation for mobile crane unstable.

Hazardous materials removal	Release of asbestos fibres.	Exposure to asbestos.	• Unidentified sources within the structure
			• Contamination of area with friable asbestos.
			• Release of fibres during removal of:
			  • thermal acoustic materials containing asbestos on ceilings and beams etc.
			  • asbestos cement building materials e.g. roof and wall sheeting.
			  • pipes insulated with asbestos.
			  • vinyl tiles.
			  • roof membranes.
			  • electrical switchboards.
			  • lift brake linings.
			  • mastic sealants.

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	Lead dust or fumes.	Exposure to lead.	• Unidentified lead paint on site. • Inhalation of lead contaminated dust. • Inhalation of lead contaminated fumes when cutting lead painted material.
	Heat generated toxic fumes.	Inhalation of fumes.	• Inhalation of Zinc fumes when cutting galvanized material. • Inhalation of lead contaminated fumes when cutting lead painted material.
	Mercury in switch gear.	Exposure to Mercury.	• Unidentified sources within structure. • Damage to electrical switchgear during removal.
	PCBs in light fittings and transformers.	Exposure to PCBs.	• Unidentified sources within structure. • Damage to fluorescent lights during removal. • Damage to transformers during removal.
	Contamination of or lack of air.	Person collapses, suffocates or is asphyxiated.	• Intake for asbestos decontamination unit, or air supply positioned too close to diesel, or other fumes. • Asphyxiation in a confined space due to lack of ventilation. • Confined Spaces Regulation not followed.
	Petrochemical products.	Exposure causing allergies or other skin irritations.	• Allergic reaction to chemicals. • No PPE or incorrect PPE worn for the required task.

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	Synthetic mineral fibres (SMFs).	Release of fibres – inhalation.	• Unidentified sources within structure. • Work not conducted in a controlled manner when demolishing walls or ceilings. • Scatter of glass fibres, mineral wool particles, SMFs. • Fibres not securely bagged and removed before damage to bags occurs. • No PPE or incorrect PPE worn for the required task.
Soft strip out	Sharp objects.	Puncture wounds, cuts, glass fragments in the eye/s.	• No PPE or incorrect PPE worn for the required task. • Debris not cleared from work area on a regular basis. • Hypodermic needles left by drug users. • Nails protruding from timber and other materials. • Removal of debris containing glass or metal with sharp edges. • Glass breaks during removal.

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Structural demolition techniques	Heavy mobile plant in operation.	Worker struck by plant.	• Working too close to plant operating area. • Workers not aware of planned exclusion zone for operation of plant. • "Spotter" not used to supervise plant. • Operator error in the control of the plant. • Risk taking - violation of instruction or rule. • Plant not switched off during on site maintenance. • Additional passenger riding on the plant. • Operator not signalled (eye contact) before approaching the operating plant or work area. • No PPE provided for the required task. (e.g. high visibility vest) • No reversing beepers.
	Plant working at height tipping debris over an open edge.	Operating plant dragged over edge.	• Work area cluttered with debris, particularly steel reinforcement and concrete. • Debris caught on plant, e.g. in wheels or tracks. • No bump rail for plant at point where debris is tipped over the edge. • Safety rail of inadequate strength, and height, unable to withstand possible plant impact. • Edge protection not replaced immediately if removed to increase access to the edge.

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	Stability of operating plant.	Roll over crushing operator.	• Inadequate foundation for operating plant. • Subsidence, collapse of earth or rubble below or adjacent to plant. • Plant operating too close to an excavation, basement or trench. • Plant inclined beyond safe operating limits.
	Plant or equipment generated projectiles.	Person/s struck by debris flung out from plant.	• Poor housekeeping around plant and equipment. • Debris spun off machinery wheels or tracks. • Shattered concrete or masonry breakage when using powered hammers or picks. • Unauthorised persons entering the work area. • Operator not adequately protected.

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	Wall/s destabilized.	Collapse of wall or part of the wall onto person/s.	• Site inspection and detailed Work Method Statement not carried out. • Engineering approval for demolition sequence not obtained. • Planned demolition sequence not followed. • Public areas, e.g. street or walkway, not closed if there is a risk of collapse. • Demolition not started at the top of the wall. • Operator untrained, lack of understanding of specific demolition sequence. • Stray debris falls, e.g. loose bricks. • Undetected changes in wall structure, e.g. ducts. • Not built to plan or plans incorrect.
	Column/s overloaded or destabilized.	Uncontrolled collapse causing death or multiple injuries.	• Site inspection and detailed Work Method Statement not carried out. • Engineering report not correct. • Planned demolition sequence not followed. • Not built to plan or plans incorrect. • Overloading of floors. • Moving plant collides with, or swinging boom, hits column. • Deterioration due to termites or rust. • Public areas, e.g. street or walkway, not closed if there is a risk of collapse

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	Floor/s overloaded or destabilized.	Floor collapse causing death or multiple injuries.	• Site inspection and detailed Work Method Statement not carried out. • Engineering report not correct. • Plant falls through floor. • Not built to plan or plans incorrect. • Changes in floor structure or part thereof during life of building e.g. old liftwell, tower crane or dumbwaiter. • Demolition materials stacked too high causing overload. • Structural engineer's report does not establish depth guidelines for the stacking of rubble. • Plant strays from defined operating areas. • Planned demolition sequence not followed. • Work area slab not regularly inspected for signs of movement or new cracking, especially from underneath.
	Use of explosives to weaken or topple main structure.	Person/s struck by debris flung out by blast.	• Insufficient technical skills (competency) to complete the required task. • Planning, including method of demolition not approved by the appropriate Authority. • Inadequate assessment of the structure and explosive technique to be used. • Inadequate early warning. • Inadequate blast absorption barriers. • Inadequate exclusion zone for workers and the public. • Worker/s stray into the blast area.

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	Falling debris or tools.	Person struck by falling objects.	• No barrier exclusion zone or size of the zone inadequate. • Drop zones not barricaded and/or sign posted. • Debris tipped from higher levels fall onto plant or persons below. • Insufficient containment. • Unauthorized persons enter the work area. • Tool dropped by worker. • Perimeter of the site not adequately secured with a combination of scaffold, wire mesh, fire retardant material, or hoardings.
Use of hand held tools	Operating steel tipped tools e.g. jackhammer.	Steel splinters flung out from shattered tool striking worker/s or pick punctures work boot.	• No PPE or incorrect PPE worn for the required task. • Jackhammer pick breaks or shatters. • Pick worn or damaged. • Jammed jackhammer resulting in loss of control. • Loss of control due to constrained work area. • Operator not trained in the use of the tool. • Operator uses foot to guide jackhammer pick.
	Operating chain saw.	Saw kicks back causing blade to strike operators body.	• Equipment not adequately maintained. • Operator not trained in the use of the tool. • No PPE or incorrect PPE worn for the required task. • Loss of control due to constrained work area. • Kickback brake not working.

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	Operating electric power saw or angle grinder.	Electric shock, burns or electrocution.	• Electrical equipment faulty. • Extension lead faulty or damaged. • Lead severed by power saw blade or disk. • Earth Leakage Switch not installed on mains supply or portable generator.
	Cutting with power saw or angle grinder.	Serious cuts from contact with saw blade or disk.	• Saw blade or grinder disk unguarded. • Guard faulty. • Saw blade or cutting disk damaged causing tool to catch and jump. • Cutting disk badly worn – blade disintegrates. • Wrong type of blade or cutting disk used. • Grinder not fitted with “Dead Mans” switch.
	Sparks generated when using power saw or angle grinder to cut metal.	Fire causing burns.	• Work area not cleared of combustible material prior to cutting. • "Spotter" (additional worker) not used to watch for spot fires that may be caused by sparks. • Fire extinguisher maintained or adjacent to work area. • Workers not trained in the use of fire fighting equipment. • No PPE or incorrect PPE worn for the required task.

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Job Activity (Tasks)	**What Can Harm You (Hazards)**	**What Can Happen (Risks)**	**Causes Which Need to be Managed (Controlled)**
	Cutting steel with Oxy Acetylene torch.	Burns to the body e.g. arms and legs. Damage to eyes.	• No PPE or incorrect PPE worn for the required task. • Hot cut piece not constrained. • Long guns (extended nozzles) not used for constrained work areas. • Damage to hoses or equipment. • No flashback arrester. • Blow back from rust and concrete.
Working at height	Working at height.	Fall e.g. from the edge or through a roof or from a boom lift.	• No edge protection. • No harness or harness not secured. • Harness anchorage incorrect. • Climbing out of elevated boom lift. • Fall through brittle roof. • Standing on a destabilized roof after fixings have been removed in advance. • Workers not trained in the use of safety equipment for working at heights • Work not supervised to ensure correct procedures are followed. • Use of a machine not considered where practicable.
	Erecting ladders or working platforms near live power.	Electric shock, burns or electrocution.	• Working too close to live power lines. • Ladder contacts power lines. • Tiger Tails not in place on power lines. • Windy causes power lines to swing. • Wind causes loss of control when erecting ladder.

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	Working from a ladder.	Fall from ladder.	• Ladder not tied off. • Load capacity of ladder exceeded. • Ladder failure due to physical damage or corrosion. • Domestic ladder used instead of commercial. • Ladder not positioned at correct angle.
	Working from a platform.	Fall from platform.	• Incorrect assembly or different systems mixed together. • Access ladders not positioned a minimum of 900 mm above the platform. • Scaffold incorrectly constructed. • Scaffold not adequately tied or braced. • Platform not fully decked. • Inadequate edge protection. • Struck by plant or equipment. • Struck by uncontrolled collapse of part of the structure or dislodged material.