Metalworking Rolling and Wire Machinery			
Business Name:		ABN:	
Business Address:			
Contact Person:	Phone:	Email:	

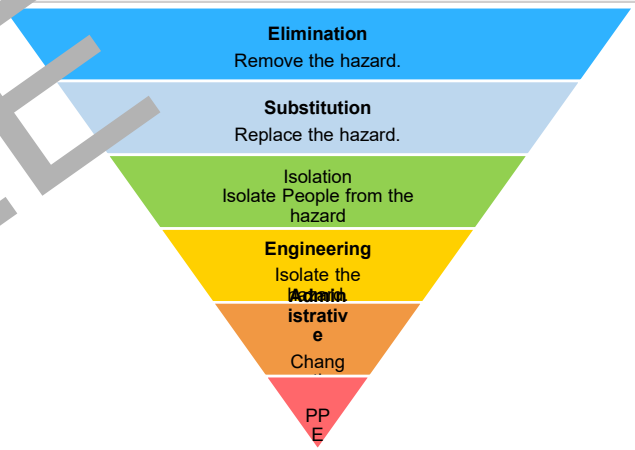
THIS RISK ASSESSMENT IS APPROVED BY THE PCBU OF THE PROJECT		
Under the Work Health and Safety Regulation (WHS Regulation), a person conducting a business or undertaking (PCBU) is required to ensure that a RISK ASSESSMENT is prepared before the proposed work starts.		
Full Name:		
Signature:	Title:	Date:

CLIENT OR PRINCIPAL CONTRACTOR DETAILS	
Client:	SCOPE OF WORKS
Project Name:	
Project Address:	
Project Manager:	
Contact Phone:	
Date Risk Assessment supplied to Project Manager:	

RISK MATRIX

LIKELIHOOD	INSIGNIFICANT	MINOR	MODERATE	MAJOR	CATASTROPHIC	SCORE	ACTION
ALMOST CERTAIN	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4 ACUTE		
LIKELY	2 MODERATE	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4A ACUTE	DO NOT PROCEED
POSSIBLE	1 LOW	2 MODERATE	3 HIGH	4 ACUTE	4 ACUTE	3H HIGH	Rev before work
UNLIKELY	1 LOW	1 LOW	2 MODERATE	3 HIGH	4 ACU	2M MO RATE	Ensure control measures in place.
RARE	1 LOW	1 LOW	2 MODERATE	3 HIGH	3 H	1L LOW	Monitor and keep records.

HIERARCHY OF CONTROLS



Risk Rating & Required Action:

4A	Stop work. The risk is intolerable. E inate the hazar redesign the activity before proceeding. A Safe Work Method Statement (SWMS) or hi er-level authorisati is required.
3H	Review and approve additional c rols b ask arts. Senior supervisor sign-off needed.
2M	Ensure all nominated controls are in ace and effe ive. Proceed with caution; monitor conditions.
1L	Proceed, following standard operating procedures Monitor and keep records.

Consequence Scale:

Consequence	People (injury/illness)	Project / Assets	Compliance / Reputation
Catastrophic	Fatality or permanent total disability	project shutdown	Significant regulator intervention; criminal prosecution
Major	Serious injury/illness (hospital > 5 days)	critical delay	Improvement notice; major media coverage
Moderate	Medical-treatment injury; lost-time > 1 day	moderate delay	Minor breach; adverse client comment
Minor	First-aid only, no lost time	negligible delay	Isolated non-conformance
Insignificant	No injury	no schedule impact	Deviation caught and corrected on site

Notes on Hierarchy of Controls:
Remember to apply controls in the preferred order shown by the coloured pyramid:

1. **Eliminate**
2. Substitute
3. Isolate
4. Engineering
5. Administrative
6. PPE

Always document **why** a lower-order control is accepted if elimination or substitution is not reasonably practicable.

aligned with Safe Work Australia's Managing the risk of fatigue at work *(2023) and ISO 45001:2018 clauses 6–8.*

JOB STEP	POTENTIAL HAZARDS	IR	CONTROL MEASURES	RR
SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
1. WHS Governance, Consultation and Legal Compliance	• Lack of an overarching WHS management system specific to metal rolling, wire and coiling machinery operations • Inadequate understanding of PCBU duties under WHS Act 2011 and WHS Regulation for plant and high-risk work • Insufficient consultation with workers, Health and Safety Representatives (HSRs) and contractors about machinery risks and changes • No formal process to review incidents, near misses and audit findings and translate them into system improvements • Inadequate resourcing (time, budget, competent people) for safe design, procurement, maintenance and training • Poor integration of WHS requirement into business planning, production targets and KPIs • Failure to verify compli of suppliers, installers a maintenance contractors with W obligations	4A	• Implement and maintain a WHS managemen ystem aligned to ISO 45001 or equivalent, specifically covering metalworking rolling and wire ma ery (includi coil winding, decoilers, roll forming, wire drawing, metal 3D printing and chain making • Develop and approve a documented WHS Po signed by sen r management explicitly committing to safe plant design, operation d maintenance • Establish a formal WHS gove nce structure (WH mittee, HSRs, defined PCBU and officer roles) with clear accounta r mac ery safety • Implement p edures to ntify, a ess an view relevant WHS legislation, Codes of Practice (Managing R of Plant in he Workp Managing Noise and Preventing Hearing Loss, Hazardous Chem ls) and ustrali Standards (e g. AS 4024 series for safeguarding machinery) • Emb HS req ments into procurement, contracting and change management procedures, includi p ualific n of contractors and suppliers on WHS performance and competence • Sched e reg ar sen leadership WHS reviews (e.g. quarterly) to monitor plant-related KPIs, incident nds, a dit ou mes and corrective action close-out • Esta formal worker consultation mechanisms for changes to plant, processes, layout and production ethods, th documented risk assessments and sign-off • nsure officers meet due diligence duties by receiving training on plant risks, visiting work areas, reviewing risk assessments and questioning adequacy of controls	3H
2. Plant Procurement, Design and Integration (All Metal Rolling and Wire Machinery)	• Selection of mach oes n comply with Australian Standards or not fit for intended use (e.g. importe rolling mills or wire drawing mac es lacking appropriate guardi emergency stops) • Poor design integration of decoilers, strip winders, coil winding stations and shuttle coiling systems leading to entanglement, crush and nip point exposures • Inadequate consideration of metal 3D printer, sputtering and high-speed wire equipment hazards during design (e.g. fumes, lasers, high voltage, moving parts) • Failure to obtain or review manufacturer's instructions, conformity	4A	• Implement a formal plant procurement procedure requiring pre-purchase risk assessment, WHS review and sign-off by a competent person for all metal rolling, coiling, wire drawing, mesh weaving, chain making and 3D printing equipment • Specify compliance with AS 4024 (Safety of machinery) and other relevant Australian Standards as mandatory in purchase contracts and technical specifications • Require detailed manufacturer information (manuals, safety specifications, guarding requirements, maintenance schedules, residual risk statements) before purchase approval • Use a multi-disciplinary team (engineering, maintenance, WHS, operators) to review design, layout and interfacing of decoilers, strip winders, roll forming lines, feed spools, and coil winding shuttles • Ensure design includes fixed and interlocked guards, light curtains, pressure-sensitive mats, emergency stops, lockable isolators, and safe access platforms as required by risk assessment • Integrate segregation controls such as physical barriers, fenced cells, interlocked gates and clearly marked exclusion zones around high-speed wires, rotating rolls and automated lines • Include ergonomic design requirements (coil lifters, manipulators, roll handling devices, correct working heights) in specifications to reduce manual handling and awkward postures	2M

JOB STEP	POTENTIAL HAZARDS	IR	CONTROL MEASURES	RR
SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
	documentation and safe operating parameters • Insufficient consideration of ergonomic factors (feed height, coil handling, roll change-out, maintenance access) • Lack of engineered segregation between high-speed moving wires, rotating rolls and pedestrian/vehicle routes • No formal verification and commissioning process for new or modified plant and associated controls		• Implement a formal commissioning procedure including functional safety testing of interlocks, emergency stops, guarding, ventilation, extraction, fire systems and alarm interlocks prior to production • Document residual risks from plant design and ensure they are captured in training, procedures and signage	
3. Guarding, Interlocks and Physical Safeguarding Systems	• Inadequate guarding of nip points, in-running rollers, chain drives, feed rolls and rotating shafts on rolling mills, wire drawing, chain making and spring forming machines • Defeatable or bypassed interlock systems on doors, hoods, shuttle coiling covers and mesh weaving machine guards • Poorly designed or maintained light curtains and safety sensors around high-speed wires and automatic strip winders • Guarding removed or modified during maintenance or setup without formal risk assessment or re-validation • Insufficient distance between protection devices (light curtains, mats) and danger zones, allowing contact before machine stops • Failure of emergency stop devices (e-stops not accessible, not functional, not tested) • Use of temporary, makeshift or damaged guards (e.g. mesh panels cable-tied, missing fasteners)	4A	• Complete a comprehensive guarding risk assessment for all metal rolling, wire, mesh weaving, chain making, spring making, strip winding and coil winding machinery with reference to AS 4024 series • Standardise engineered guarding solutions (fixed guards, interlocked guards, distance guarding, enclosed cells) and prohibit operation of unguarded or partially guarded equipment • Implement a formal change management and engineering approval process for any alteration to guards, interlocks or safety circuits, including verification and validation testing • Schedule routine inspection and functional testing of interlocks, light curtains, pressure mats and emergency stops with documented results and defect rectification timeframes • Develop and enforce a Guard Defeat and Bypass policy that clearly prohibits intentional defeat of safety systems and sets disciplinary consequences • Ensure ergonomic design of guards (gas struts, hinges, quick-release latches) to reduce the incentive for workers to remove or bypass guarding • Install clearly visible and accessible emergency stop devices along all operator positions, coil loading areas and wire feed paths, and include them in pre-start checks • Train operators, setters and maintenance personnel in safeguarding principles, correct use of interlocks, and reporting requirements for any compromised guard	2M
4. Control Systems, Automation and High-Speed Wire Dynamics	• Malfunction or failure of programmable logic controllers (PLCs), safety relays or variable speed drives leading to unexpected start-up, continuous run-on	4A	[redacted]	2M

JOB STEP	POTENTIAL HAZARDS	IR	CONTROL MEASURES	RR
SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
	or uncontrolled acceleration of rolls and wires • Inadequate safety-related control system design for decelerating high-speed wires, roll formers and strip winders during fault conditions • Lack of controlled start-up and restart logic after emergency stops, jams or power interruptions • Poor integration between decoiler tension controls, coiling devices and downstream equipment, causing sudden tension release (whiplash) of wires or coiled strip • Software changes or program uploads made without verification, validation and change control documentation • Defective or incorrectly configured sensors (tension sensors, limit switches, encoders, over-speed detectors) on winding and drawing lines • Insufficient alarm management, leadi to alarm floods, ignored gs or disabled alarms		[redacted]	
5. Plant Layout, Traffic Management and Exclusion Zones	• Congested layou around roll mills, decoilers, strip win shuttles nd mesh weaving machi creating cr n and entanglement risks • Uncontrolled interaction pedestrians, forklifts and coil handling equipment when moving large coils, feed spools and rolls • Inadequate demarcation of exclusion zones around high-speed wires, rotating rolls, coiling shuttles and metal sputtering or 3D printing cells • Poor visibility and lighting in coil loading, decoiling and roll change-out areas • Lack of safe access (platforms, stairs, walkways) resulting in climbing on plant or coils	3H	[redacted]	2M

JOB STEP	POTENTIAL HAZARDS	IR	CONTROL MEASURES	RR
SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
	• Emergency exits and e-stop access obstructed by stored materials, coils or waste bins		[redacted]	
6. Coil, Strip and Wire Handling Systems (Mechanical and Manual)	• Excessive manual handling of heavy coils, feed spools, rolls and die components leading to musculoskeletal disorders • Uncontrolled movement, tipping or collapse of standing coils, stacked spools or strip packs • Use of unsuitable lifting equipment or attachments (improvised hooks, slings, coil grabs) for loading decoilers and stri winders • Inadequate systems for handling long flexible and high-tension wires or strip, resulting in whipping a lashing injuries • Poorly planned r and die change processes requirin awkward s and pinch-point con • Inadequate inspection and maintenance of cranes, hoists, f lifts and coil lifters	3H	[redacted]	2M
7. Maintenance, Inspection and Asset Management of Plant	• Breakdown of rolling mills, wire drawing and chain making machines due to inadequate preventative maintenance, leading to mechanical failures and increased injury risk • Operating with worn or damaged components (rolls, dies, guides, bearings, guards) that compromise safety and product quality	3H	[redacted]	2M

JOB STEP	POTENTIAL HAZARDS	IR	CONTROL MEASURES	RR
SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
	• Unplanned downtime prompting unsafe shortcuts, bypassed interlocks or rushed maintenance • Incomplete or inaccurate maintenance records hindering risk assessment and decision-making • Failure to identify developing defects in safety-critical components (brakes, clutches, guarding, emergency stops, tension systems) • Reliance on third-party service providers without adequate WHS oversight		[redacted]	
8. Isolation, Lockout/Tagout and Access for Cleaning, Setup and Fault Clearing	• Inadequate isolation procedures leading to unexpected energisation or movement of rolls, wires, coils or dies during cleaning, thread-up, jam clearing or adjustment • Use of informal practices (e.g. relying on emergency stop only) instead of full isolation for intervention within [redacted] zones • Multiple energy sources (electrical, pneumatic, hydraulic, stored mechanical tension, gravity) not all isolated and dissipated • Lack of standardised lockout/tagout equipment and absence of group lock arrangements for multi-person tasks • Inadequate visual confirmation of isolation points and status on complex plant lines • Contractors and short-term workers not fully integrated into site isolation systems	4A	[redacted]	2M

JOB STEP	POTENTIAL HAZARDS	IR	CONTROL MEASURES	RR
SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
9. Competency, Training and Supervision of Operators and Setters	• Operators and setters of rolling mills, chain making, spring forming, mesh weaving, wire drawing and 3D metal printing equipment lacking formal competency • Over-reliance on informal on-the-job learning without structured training or assessment, leading to unsafe habits • Insufficient understanding of system-level risks (e.g. tension control, wire dynamics, decoiler hazards) and consequences of parameter changes • Inadequate supervision, particularly on night shift, weekends and during high-production campaigns • Failure to provide refresher training after plant modifications, incidents or procedure changes • Language, literacy or numeracy barriers affecting understanding of procedures, signs and controls	3H	[redacted]	2M
10. Hazardous Chemicals, Fumes, Dusts and Thermal Risks	• Exposure to meta umes, dusts and vapours from meta D print d sputtering operation processi and lubrication systems • Use of flammable or combustib solvents, coolants and cle g agents without adequate controls • Inadequate ventilation or extraction on enclosed coil winding, wire drawing and roll forming operations where oils and lubricants are atomised • Accumulation of fine metal dusts in enclosures and ducts creating fire and explosion risks • Thermal burns from hot strip, coils, rolls, dies and components exiting process lines or post-heat treatment • Incorrect storage, labelling and segregation of hazardous chemicals	4A	[redacted]	2M

JOB STEP	POTENTIAL HAZARDS	IR	CONTROL MEASURES	RR
SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
	used in cleaning, coating or 3D printing support processes		[redacted]	
11. Noise, Vibration and Fatigue Management	• Prolonged exposure to high noise levels from rolling mills, wire drawing blocks, mesh weaving looms, strip winders and chain making machines • Hand-arm and whole-body vibration exposure from vibrating plant, grinders and percussive tools used in die and roll maintenance • Extended shifts and monotonous monitoring tasks around automated lines contributing to fatigue and reduced vigilance • Inadequate break schedules and work-rotation in noisy, high-concentration areas • Failure to conduct baseline and periodic audiometric testing where required by legislation	3H	[redacted]	2M
12. Electrical, Pneumatic and Hydraulic Energy Safety	• Non-compliant electrical installations on rolling mills, wire drawing machines, mesh looms, decoilers and 3D printers • Exposed live parts or damaged cables creating electric shock or arc flash risks • Uncontrolled release of pneumatic or hydraulic energy in clamping, tensioning and coiling systems • Inadequate earthing and bonding of metal equipment, wire paths and 3D printers leading to static discharge or shock risks • Lack of periodic inspection and testing of electrical and fluid power systems	4A	[redacted]	2M

JOB STEP	POTENTIAL HAZARDS	IR	CONTROL MEASURES	RR
SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
	• Unclear responsibilities between site and OEM contractors for electrical safety of supplied equipment		[redacted]	
13. Emergency Preparedness, Incident Response and First Aid	• Delayed or ineffective response to entanglement, crush or amputation incidents on rolling and wire machinery • Lack of clear emergency stop, isolation and rescue protocols for coil winding shuttles, high-speed wires and enclosed 3D printing or sputtering cells • Insufficient first aid resources and training for lacerations, amputations, burns, eye injuries and crush trauma • Poor communication processes during emergencies, particularly in noisy production areas • Inadequate planning for fire, explosio or release events related to metal dusts flammable chemicals an rical faults	3H	[redacted]	2M
14. Contractor, Visitor and Supplier Management	• Contractors performing installation maintenance or commissioning rolling, coiling, wire drawing and 3D printing equipment without adequate knowledge of site-specific hazards and procedures • Inconsistent WHS standards between PCBU and contractors leading to gaps in control measures (e.g. isolation, guarding, working at height around plant) • Visitors and suppliers inadvertently entering exclusion zones or interfering with plant operations • Concurrent work activities (e.g. construction, electrical work, plant	3H	[redacted]	2M

JOB STEP	POTENTIAL HAZARDS	IR	CONTROL MEASURES	RR
SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
	modifications) creating additional plant interaction risks		[redacted]	
15. Documentation, Procedures and Change Management	• Outdated or inconsistent procedures for operating, setting, cleaning and maintaining metal rolling and wire machinery • Uncontrolled changes to plant, software, materials or production speeds without formal risk assessment (management of change failure) • Poor version control leading to multiple conflicting instructions in circulation • Insufficient documentation of non-routine tasks (e.g. major overhaul, die changes, commissioning of new lines) • Reliance on key individuals' knowledge without capturing critical information in structured documents	3H	[redacted]	2M
16. Monitoring, Audit, Health Surveillance and Continuous Improvement	• Failure to detect emerging risks from changes in production volumes, material types (e.g. new alloys, wire gauges) or technology (new 3D printers or sputtering units) • Lack of systematic monitoring of leading and lagging WHS indicators related to plant safety • Under-reporting of near misses and minor incidents around machinery, preventing learning and improvement • No health surveillance for workers exposed to noise, vibration, hazardous substances or repetitive manual handling	3H	[redacted]	1L

JOB STEP	POTENTIAL HAZARDS	IR	CONTROL MEASURES	RR
SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
	• Infrequent or superficial WHS audits of plant systems, allowing deterioration of controls		[redacted]	

EMERGENCY RESPONSE – CALL 000 FOR EMERGENCIES

Ensure to have an Emergency Management Plan in place as well as adequate numbers of trained first aid staff with easy access to fully stocked first aid kits, rescue equipment, material safety data sheets, adequate access to emergency communication equipment and fire-fighting equipment suitable for all classes of fire and ignition sources.

LEGISLATIVE REFERENCES

RELEVANT LEGISLATION AND CODES OF PRACTICE. DELETE THE LEGISLATIVE REFERENCES FOR ANY STATE THAT ARE NOT APPLICABLE

Queensland & Australian Capital Territory
Work Health and Safety Act 2011
Work Health and Safety Regulations 2011
Legislation QLD: https://www.worksafe.qld.gov.au/laws-and-compliance/work-health-and-safety-laws
Codes of Practice QLD: https://www.worksafe.qld.gov.au/laws-and-compliance/codes-of-practice
Legislation ACT: https://www.worksafe.act.gov.au/laws-and-compliance/acts-and-regulations
Codes of Practice ACT: https://www.worksafe.act.gov.au/laws-and-compliance/codes-of-practice

New South Wales
Work Health and Safety Act 2011
Work Health and Safety Regulations 2025
Legislation NSW: https://www.safework.nsw.gov.au/legal-obligations/legislation
Codes of Practice NSW: https://www.safework.nsw.gov.au/resource-library/list-of-codes-of-practice

Northern Territory
Work Health and Safety (National Uniform Legislation) Act 2011
Work Health and Safety (National Uniform Legislation) Regulations 2011
Legislation NT: https://worksafe.nt.gov.au/laws-and-compliance/workplace-safety-laws
Codes of Practice NT: https://worksafe.nt.gov.au/forms-and-resources/codes-of-practice

South Australia
Work Health and Safety Act 2012 (SA)
Work Health and Safety Regulations 2012 (SA)
Legislation for SA: https://www.safework.sa.gov.au/resources/legislation
Codes of Practice for SA: https://www.safework.sa.gov.au/workplaces/codes-of-practice#COPs

Tasmania
Work Health and Safety Act 2012
Work Health and Safety (Transitional and Consequential Provisions) Act 2012
Work Health and Safety Regulations 2012
Work Health and Safety (Transitional) Regulations 2012
Legislation for TAS: https://worksafe.tas.gov.au/topics/laws-and-compliance/acts-and-regulations
Codes of Practice for TAS: https://worksafe.tas.gov.au/topics/laws-and-compliance/codes-of-practice

Details of permits, licenses or access required by regulatory bodies (add or delete as required):

- Permits from local council
- Authorisation to commence work
- Any required documents.

Victoria
Occupational Health and Safety Act 2004
Occupational Health and Safety Regulations 2017
Legislation VIC: https://www.worksafe.vic.gov.au/occupational-health-and-safety-act-and-regulations
Codes of Practice VIC: https://www.worksafe.vic.gov.au/compliance-codes-and-codes-practice

Western Australia
Work Health and Safety Act 2020
Work Health and Safety Regulations 2022
Legislation Western Australia: https://www.commerce.wa.gov.au/worksafe/legislation
Codes of Practice WA: https://www.commerce.wa.gov.au/worksafe/codes-practice

Safe Work Australia Links
Law and Regulation (All States): https://www.safeworkaustralia.gov.au/law-and-regulation
Model Codes of Practice: https://www.safeworkaustralia.gov.au/resources-publications/model-codes-of-practice

Model Codes of Practice

- Managing noise and preventing hearing loss at work
- Confined spaces
- Labelling of workplace hazardous chemicals
- Managing risks of hazardous chemicals in the workplace
- Welding processes
- First aid in the workplace
- Managing the risk of falls at workplaces
- Hazardous manual tasks
- Managing the risk of falls in housing construction
- Managing electrical risks in the workplace
- Demolition work
- Excavation work
- Work health and safety consultation, cooperation and coordination
- Managing the work environment and facilities
- How to manage work health and safety risks
- Managing risks of plant in the workplace
- Construction work