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Functional Flowchart

Not applicable

Objective

To provide a corporate standard that outlines SCL's procedure for managing hazards associated with the use of **earthmoving equipment** and the methods by which safe **earthmoving equipment** controls are to be implemented.

Scope

This corporate standard applies to SCL **employees** and controlled contractors using **earthmoving equipment**, or any situation in which a SCL **employee** or controlled contractor is required to undertake earthmoving activities within a SCL operated and / or maintained site.

Definitions

Skid-steer loader: Smaller (able to be 'skid' mounted to transport to job site) loaders which may have alternative attachments than a bucket for loading (e.g. Bobcat).

Competent person: a person who has through a combination of training, education and experience, acquired knowledge and skills enabling that person to perform correctly the specified task. **Operators of earthmoving equipment are deemed to have a minimum level of competence if they hold the appropriate licence(s) for the earthmoving equipment to be used. Additional familiarisation is to be provided where relevant.**

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+ + **Dozer:** a machine composed of a wheeled **tractor** or crawler **tractor** with a dozer blade mounted at the front of the machine.

+ **Earthmoving machine:** a machine used for the purpose of moving or transporting earth, overburden, rubble, spoil, or similar material.

+ **Earthmoving equipment:** any mobile plant / equipment used for undertaking earthmoving activities.

+ **Front-end loader:** a self-propelled crawler or wheeled machine with an integral front mounted bucket-supporting structure and linkage, which loads or excavates through forward motion of the machine, and lifts, transports and discharges material.

Grader: a self-propelled wheeled machine having an adjustable blade, positioned between the front and rear axles, which cuts, moves and spreads materials usually to grade requirements.

SWL: Safe Working Limit.

Tractor: Self-propelled crawler or wheeled machine used to exert a push or pull force through a mounted attachment or drawbar.

Responsibilities

Position/Title	Description
OH&S Systems Manager	To maintain the currency and accuracy of the Earthmoving Equipment Corporate Standard reflective of legislative and corporate change
Station / Site Manager	To monitor the implementation of the Earthmoving Equipment Corporate Standard and allocate responsibilities and resources to ensure site-specific practices/procedures are developed to satisfy the Corporate Standard
Workers (SCL employees or controlled contractors)	To comply at all times with the requirements specified within this Corporate Standard and any site-specific procedures

Earthmoving Equipment Hazards

In relation to the operation of **earthmoving equipment**, **SCL has implemented a** safe system to control risks to health and safety arising from hazards and issues such as, but not limited to:

- roll-over;
- falling debris;
- contact with utility services, scaffolding etc;
- striking personnel; and
- exposure to excessive noise.

Risk Assessment

Earthmoving equipment hazards are to be assessed and managed as per a work method statement for the relevant work activity.

Controls

1. Design and Safety Equipment

1.1. **Earthmoving equipment** (i.e. **front-end loaders**, excavators, backhoes, **dozers**, **graders**, **skid-steer loaders** and **tractors** etc.) is to be fitted with Falling Object Protective Structures (FOPS) and Roll Over Protective Structures (ROPS) in accordance with AS 2294: Earthmoving Machinery – Protective Structures, and AS 1636: Tractor Roll Over Protective Structures.

1.2. All **earthmoving equipment** is to be fitted with a suitable seat belt(s) / restraint device in accordance with AS 2664: Earthmoving Machinery – Seat Belts and Seat Belt Anchorages. Passengers are not to travel on **earthmoving machinery** unless restrained by a seat belt / restraint device in a proper seat.

Note: Operators are to ensure that seat belts are worn at all times during operation.

1.3. All glass panels and windscreens fitted to **earthmoving equipment** are to be in accordance with AS/NZS 2080 – Safety Glass for Land Vehicles.

1.4. All **earthmoving equipment** is to have the safe working load (**SWL**) identified and permanently and legibly marked on the equipment.

Note: The SWL of any earthmoving equipment is not to be exceeded.

1.5. All **earthmoving equipment** is to also be fitted with the following (where applicable):

- reversing beepers / travel alarms; or
- flashing amber lights; and
- two-way radio; and
- isolation switch.

1.6. A suitable fire extinguisher is to be maintained within the cab of all **earthmoving equipment**.

1.7. Machine guarding is not to be removed or modified unless removal or modification is required for maintenance, servicing or repair, or is approved by the manufacturer.

2. General

2.1. Prior to work commencing, the following checks are to be undertaken **and log book completed**:

- ensure attachments are in good order, correctly fitted and ready for use*;
- ensure safety devices (horn, mirrors & lights etc.) are functioning correctly; and
- check machine for damage (e.g. fluid leaks, punctured tyre etc.).

Note: Operators are not to enter or leave earthmoving equipment whilst attachments are raised.

2.2. Operators are to also:

- ensure that all deck plates, steps and handles are kept in good repair and are free from mud, grease and oil;
- mount and dismount **earthmoving equipment** using steps and grab handles;

Note: Always use both hands and face the machine when mounting / dismounting earthmoving equipment.

- wear appropriate PPE, which may include (where relevant) –
 - reflective vests;
 - sun protection;
 - hearing protection;
 - safety glasses; and
 - safety footwear.

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Note: Refer to [HB#562508: Personal Protective Equipment \(PPE\)](#), for further information regarding PPE requirements.

- obey all on site traffic management controls in accordance with [HB#562513: Traffic Management](#), including (where applicable):
 - speed limits;
 - wearing of seat belts;
 - barricading etc.
 - yield right-of-way to any on-coming loaded machine;
 - ensure no personnel are present on, under or in close proximity to the equipment prior to starting;
 - keep front, rear and side windows clean to allow adequate visibility;
 - operate equipment within the maximum permissible gradient, side gradient and gradient in the line of travel, for the type and model of plant;
 - use the same gear range (usually a low gear) descending a slope as was required to ascend the slope;
 - avoid large obstacles, deep holes and soft edges;
 - operate equipment in well-ventilated areas to allow emissions to be safely expelled; and
 - switch off engines before refuelling, servicing or greasing operations commence;
- 2.3. During **earthmoving equipment** maintenance activities, or the fitting of attachments to machines, precautions such as the following are to be ensured as relevant:
- sound placement of machine;
 - locking of brakes;
 - stopping of engine; and
 - appropriate tags are to be positioned in conspicuous locations to prevent the use of the **earthmoving equipment**, (i.e. 'Danger' or 'Out of Service' tags). The individual that positions the tags during maintenance activities is to be the only person to remove them once that person has ensured that the **earthmoving equipment** is ready for safe operation.
- 2.4. Where applicable, areas where **earthmoving equipment** is operated is to be appropriately signed and barricaded in accordance with [HB#570000: Safety Signs](#) and [HB#560712: Barricading and Exclusion](#), to ensure unauthorised access is restricted. As a minimum, signage is to display the following information:
- PPE requirements; and
 - "No Unauthorised Access".
- 2.5. Where **earthmoving equipment** is operated on a public road, it is to be operated in accordance with the Traffic Regulations for the particular State / Territory, and is to be fitted with the following:
- horn;
 - brakes;
 - head, tail and turn signal lights;
 - reflectors;
 - rear-view mirror; and
 - reverse beepers.
- 2.6. Safe approach distances are to be confirmed prior to **earthmoving equipment** being brought into areas where overhead powerlines are located. Placement of identification markers, (e.g. tiger tails), or isolating electrical lines is only to be undertaken following specific consultation with, and direction from, the relevant local electrical authority.

Note: Refer to [HB#560790: Electrical Safety](#), for further information regarding safe approach distances and exclusion zones for overhead powerlines.

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2.7. Excavation activities are to be carried out in accordance with the [Corporate Standard for Excavation and Digging](#). Prior to excavation activities on site, preparations are to be undertaken to identify and mark all underground services that may be at risk of being contacted. Operators are to be involved in this process and / or made specifically aware of all the locations, depths and any other pertinent underground service information.

Note: Refer to [HB#560720: Excavation and Digging](#), for further information regarding requirements for excavation activities.

2.8. When parking **earthmoving equipment** the following is to be ensured:

- ground is even and compact;
- gears are in neutral or park position;
- blades, buckets and other attachments are lowered to the ground and securely blocked;
- park brake is locked; and
- engine stopped.

2.9. The following also applies to all relevant **earthmoving equipment**:

- adequate guarding in accordance with AS 4024 Safeguarding of Machinery;
- only operate controls from within the cab, unless controls are appropriately positioned outside of cab (i.e. tipper trucks);
- to be kept in gear at all times whilst operating / moving, and is not to be allowed to coast downhill; and
- store with all implements and attachments lowered to the ground.

2.10. Any malfunction or damage to **earthmoving equipment** is to be reported immediately to the relevant person (i.e. supervisor, site manager), who is to arrange for the inspection / repair of the equipment by a **competent person** (i.e. mechanic) as soon as practicable. The **earthmoving equipment** is also to be tagged out with a '**Caution – Out of Service**' tag, have its keys removed and is not to be operated until it is repaired, or until a **competent person** has deemed it safe for use.

3. Front-end Loaders / Excavators / Backhoes

General

3.1. Wherever possible, a level area is to be created when work is required on a steep grade. If not practicable to do so, operators are to ensure that the machine is operated slowly and that downhill movements of the boom are restricted and minimised as much as possible.

3.2. Turns are to be undertaken slowly and in a wide arc when travelling on a steep slope.

3.3. Additional controls (where relevant) include:

- drive at slow speeds to ensure adequate control;
- operators are to carry the bucket as low as possible, ensuring teeth are pointed up as vertical as possible, to maintain stability and maximise visibility;
- not to be used to hoist personnel;
- material carried in the bucket is to be secured from accidental dislodgment;
- the bucket is to face uphill at all times to avoid tipping when operating on slopes; and
- the de-clutch brake is not to be used when descending a slope.

Excavators / Backhoes

3.4. During the excavation of trenches, material is to be placed at a distance as far as practicable (i.e. minimum 600mm) from the trench, where it is not likely to subside back into trench or jeopardise the stability of the trench wall.

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- ++ 3.5. During excavation activities operators are to ensure that the ground beneath the machine is not undercut.
- + 3.6. Jerky slewing movements and sudden braking are to be avoided to keep the machine stable and to minimise the probability of overloading machine components.
- + 3.7. When excavators are used in crane mode, competent operators are to ensure the safe working capacity of the machine, and maximum side gradient during lifting, is not exceeded and is within the rated lift capacity. Only correct and certified lifting equipment, inspected as fit for use with the excavator and for the lifting task(s) is to be used.

Note: Refer to [HB#560726: Lifting Equipment](#), for further information regarding the inspection, selection and use of lifting equipment.

- 3.8. **Earthmoving machines** with quick-hitch implements are not to be operated under any circumstances without the safety pin locked in position.
- 3.9. When ascending / descending an incline, the bucket is to be placed in a safe position to counter balance the machine.
- 3.10. Buckets are not to be slewed over / above personnel under any circumstances.

4. Dozers / Graders

General

- 4.1. **Dozers / graders** are not to be operated in unsafe locations adjacent to edges of banks, ditches, cuts or fills or near overhanging material where vibration and / or the weight of the **dozer / grader** may cause the edge to give way or overhanging material to fall.
- 4.2. Travelling across a slope is to be avoided wherever possible. If not possible, extreme caution is to be taken by operators to ensure roll over does not occur. If the machine starts to slide sideways when working across a slope, the operator is to turn the **dozer / grader** downhill and drop the blade carefully.

Note: This is only to be undertaken in extreme emergencies and the manufacturer's requirements for maximum slope access are to be complied with at all times.

- 4.3. **Dozer / grader** blades are to be kept close to the ground to maintain balance when the machine is travelling around site, and in particular when travelling up a slope.

Graders

- 4.4. For maximum stability **graders** are to be:
 - operated at low speed;
 - operated with front tyres leaning toward the uphill side; and
 - operated such that the material is cast to the downhill side of the machine.
- 4.5. **Graders** are to be operated on as level a surface as possible when cutting high banks with the blade positioned as low as practicable to ensure stability.
- 4.6. Operators are to leave the edges of fill batters slightly tilted back to the centre of the fill to ensure suitable compaction and safety for roller operations.

Land Clearing

- + + 4.7. Where land clearing operations are undertaken, operators are to consider / ensure the following prior to commencing clearing:
 - + ▪ machine(s) is fitted with suitable canopy cover;
 - + ▪ ground slope is considered for the type of machine and methods proposed;
 - + ▪ wind speed and direction;
 - + ▪ ground cover including hazards that may be encountered such as dead / fallen trees; and
 - + ▪ capacity limits are not exceeded.
- 4.8. Prior to work commencing, operators are to ensure that falling trees will safely clear the machine and operator.
- 4.9. Operators are to use two-way radios to ensure communication during clearing operations.
- 4.10. Operators are to clear and remain aware of other personnel within the area whilst undertaking land clearing operations.

5. Skid-Steer Loaders

- 5.1. Additional controls for the operation of **skid-steer loaders** include:
 - operators are to ensure safety devices to lock bucket arms in the raised position are available and used where necessary.
 - are to be fitted with protective cabin screenings.

6. Trucks / Tippers

General

- 6.1. Prior to operation of trucks / tippers, the following checks are to be undertaken by the operator (minimum):
 - check brakes are functioning correctly; and
 - check steering is functioning correctly.
- 6.2. Truck / tipper operators are to ensure a safe distance when following other vehicles. As a minimum, one truck / tipper length for every 10km per hour of speed is considered a safe travelling distance.
- 6.3. Where practicable, trucks / tippers are to be reversed under the direction of a signal person.
- 6.4. Truck / tipper operators are to remain cautious of any load spillage, as it may present a hazard to other personnel and / or other mobile plant / vehicle tyres.
- 6.5. Where trucks / tippers are to reverse to a tip head, a protective beam, timber baulk or signal person are to be used to ensure the truck / tipper does not fall over the tip head edge.
- 6.6. **A designated exclusion zone is to be implemented in the vicinity of tipper operations.**

Loading/Unloading

- 6.7. The loading of trucks / tippers is to be in accordance with the following:
 - do not access or egress the cab whilst loading is in operation.
 - materials are to be loaded to ensure they do not project beyond the body of the truck.
 - loads are to be secured at the lowest point on the tray with ropes or chains.
 - **loads are to be covered where relevant.**

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6.8. The unloading of trucks / tippers is to be in accordance with the following:

- truck / tipper bodies are to be lowered before leaving the area.
- materials are only to be loaded when the surface under the truck is stable and as flat as possible to avoid roll over.
- no part of a person's body is to be positioned under a raised truck / tipper body unless it is securely propped.

7. Tractors

7.1. The operation of **tractors** is to be in accordance with the following:

- reverse up steep slopes to reduce the risk of roll over;
- wheels are to be set as wide apart as practicable to increase stability;
- drive at slow speeds to ensure adequate control over unexpected hazards such as logs, ditches, rocks and uneven ground;
- speed is to be reduced prior to turning or applying brakes. Turns are to be undertaken slowly and in a wide arc when travelling;
- drive cautiously and in low gear when descending slopes;
- do not mount or dismount whilst the engine is still running unless, the transmission is in neutral, or in park position and the park brake is effectively engaged;
- when attaching equipment, only the drawbar three-point linkage or other specified hitch / mounting points are to be used;
- weight applied to a three-point linkage is not to exceed manufacturer's specifications.
- prior to an obstruction being cleared, the **tractor** is to be stationary, the drive to the attachment disconnected and any moving parts disengaged.

Site Specific Management of Earthmoving Equipment

Inspection and Maintenance

1. Routine / preventative maintenance is to be carried out on all SCL **earthmoving equipment**, by the manufacturer, supplier or other qualified person, as per manufacturers' instructions.
2. All safety features and warning devices on **earthmoving equipment** are to be maintained and tested regularly by a **competent person**.

Log Books and Register

3. Log books are to be kept with all **earthmoving equipment** (or other designated area), and are to be maintained by the operator(s) or another designated **competent person**. These log books are to contain details of all maintenance and repairs undertaken on a particular machine.
4. All SCL sites where SCL owned **earthmoving equipment** is kept / operated are to establish and maintain a Mobile Plant Register ([SCL Form : Mobile Plant Register](#)), which is to contain (as a guide) the identification, inspection, maintenance and repair details of all **earthmoving equipment**.

Training and Competency of Personnel

1. Where the relevant state/territory WH&S legislation requires the operator of certain earthmoving equipment to be certified, the use of such equipment is only to be undertaken either by a certified operator, or under the conditions stipulated in the relevant legislation.

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- 2. All persons involved with **earthmoving equipment** operations are to be deemed competent to perform the various **earthmoving equipment** planning roles and work activities (where relevant). **Operators of earthmoving equipment are deemed to have a minimum level of competence if they hold the appropriate licence(s) for the earthmoving equipment to be operated. Operator familiarisation is to be provided where relevant.**
- 3. **Persons are to receive training as per [HB#794196 – HS023 – Earthmoving Equipment Awareness Training Rationale](#).**

Review

This Corporate Standard is reviewed every 2 years.

Links and References

[HB#659518: Barricading and Restricted Access](#)

[HB#560790: Electrical Safety](#)

[HB#537700: HS&E Hazard Management](#)

[HB#560720: Excavation and Digging](#)

[HB#560726: Lifting Equipment](#)

[HB#562508: Personal Protective Equipment](#)

[HB#570000: Safety Signs](#)

[HB#562513: Traffic Management](#)

[HB#560721: Excavation and Digging Control Guide](#)

[SCL Form: Mobile Plant Register](#)

[HB#623746 – Earthmoving Equipment Awareness Training](#)

[HB#794196 – HS023 – Earthmoving Equipment Awareness Training Rationale.](#)

QLD Workplace Health & Safety Regulation 1997, Parts 3, 16 & 17 and Schedule 5.

QLD Plant Code of Practice, 2005

QLD Safe Design and Operation of Tractors Code of Practice, 2005

VIC Occupational Health & Safety (Plant) Regulations 1995

VIC Code of Practice for Plant 1995

WA Occupational Safety & Health Regulations 1996, Parts 4 & 6

SA Occupational Health, Safety & Welfare Regulations 1995, Part 3

NSW Occupational Health & Safety Regulation 2001, Parts 5 & 9.1

TAS Workplace Health & Safety Regulations 1998, Part 4 and Division 3

NT Work Health (Occupational Health & Safety) Regulations 1992, Parts 8 & 10

ACT Occupational Health and Safety (Certification of Plant users & Operators) Regulation 2000

NOHSC: 1006 - Certification Standard for Users and Operator of Industrial Equipment, (3rd Ed.), 2001

NOHSC: 7019 - National Guidelines for Occupational Health and Safety Competency Standards for Load shifting Equipment and Other Types of Specified Equipment. (1992)

AS 1636: 1996 Tractor Roll Over Protective Structures

AS 2294: 1997 Earth-moving machinery – Protective structures

AS 2664: 1983 Earthmoving machinery – Seat belts and seat belt anchorages

AS 4024: 2006 Safeguarding of machinery

AS/NZS 2080: 2006 Safety glass for land vehicles

AS/NZS 2153: 1997 Tractors and machinery for agriculture and forestry – Technical means for ensuring safety

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Attachments

+ + Attachment 1: Audit Checklist

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Attachment 1: Audit Checklist

SCL Site: _____ Date: ____ / ____ / ____ Conducted By: _____ Position: _____
(Print First & Last Names)

Item	Status	Action Required	Responsible Person	Completed (Insert Date & Initials)
General				
Log books maintained and up-to-date?	Yes <input type="checkbox"/> No <input type="checkbox"/>			
SWL identified and permanently marked on equipment?	Yes <input type="checkbox"/> No <input type="checkbox"/>			
Deck plates, steps and handles in good repair and free from mud, grease, oil etc.?	Yes <input type="checkbox"/> No <input type="checkbox"/>			
Safety Devices				
Falling object protection, and roll-over protection fitted?	Yes <input type="checkbox"/> No <input type="checkbox"/>			
The following is fitted and in good working order:	Yes <input type="checkbox"/> No <input type="checkbox"/>			
• seat belt(s) / restraint device?	Yes <input type="checkbox"/> No <input type="checkbox"/>			
• reversing alarm?	Yes <input type="checkbox"/> No <input type="checkbox"/>			
• flashing amber light?	Yes <input type="checkbox"/> No <input type="checkbox"/>			
• two-way radio?	Yes <input type="checkbox"/> No <input type="checkbox"/>			
• isolation switch?	Yes <input type="checkbox"/> No <input type="checkbox"/>			
Fire extinguisher located in cab?	Yes <input type="checkbox"/> No <input type="checkbox"/>			
Machine guarding is not modified or removed?	Yes <input type="checkbox"/> No <input type="checkbox"/>			
All glass panels and windscreens fitted to earthmoving equipment are in accordance with AS/NZS 2080?	Yes <input type="checkbox"/> No <input type="checkbox"/>			
Earthmoving equipment that is operated on a public road is fitted with:				
▪ horn?	Yes <input type="checkbox"/> No <input type="checkbox"/>			

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<ul style="list-style-type: none"> ▪ brakes? ▪ head, tail and turn signal lights? ▪ reflectors? ▪ + rear-view mirror? ▪ reverse beepers? 	Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>				
Appropriate PPE available/used by operators?	Yes <input type="checkbox"/> No <input type="checkbox"/>				
Signage and barricading as relevant is available/used?	Yes <input type="checkbox"/> No <input type="checkbox"/>				
All relevant equipment has guarding in accordance with AS4024?	Yes <input type="checkbox"/> No <input type="checkbox"/>				
Site Specific Management					
Inspections and routine / preventative maintenance undertaken by competent person?	Yes <input type="checkbox"/> No <input type="checkbox"/>				
Logbooks are kept with all equipment?	Yes <input type="checkbox"/> No <input type="checkbox"/>				
Mobile plant register maintained?	Yes <input type="checkbox"/> No <input type="checkbox"/>				
Training and Competency					
Operators hold relevant and current licence(s)?	Yes <input type="checkbox"/> No <input type="checkbox"/>				
Persons involved with earthmoving equipment operations are deemed competent to perform the various earthmoving equipment planning roles and work activities?	Yes <input type="checkbox"/> No <input type="checkbox"/>				
Operator familiarisation provided where relevant?	Yes <input type="checkbox"/> No <input type="checkbox"/>				
All persons operating earthmoving equipment have received training as per HB#794196 – HS023 – Earthmoving Equipment Awareness Training Rationale?	Yes <input type="checkbox"/> No <input type="checkbox"/>				
Training recorded?	Yes <input type="checkbox"/> No <input type="checkbox"/>				

Other / Further Details:

