Generic Site SOP's

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Standard Operating Procedures

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Workshop SOP's

SOP 001 - Lifting Equipment

Ref	Description
0	Lifting Equipment is the term used for any and all items used in lifting operations including but not limited to chains, slings, eyebolts, clutches, forks, etc.
1	Lifting equipment shall be selected and purchased by competent persons only.
2	All lifting equipment when brought into the company shall be notified to the Health & Safety Coordinator for inclusion on the Lifting Equipment Control Register (Doc Control).
3	Lifting equipment will be stored at the an appropriate area on site. Lifting equipment shall be stored off the ground and in cool, dry area away from any sources of heat, chemical exposure etc.
4	Lifting equipment when out on site shall be kept with the section foreman and used as appropriate. The foreman on the job has the responsibility to ensure that all lifting equipment is returned to the central store following completion of it's use.
5	All loads will be slung using certified equipment (within 6 months of certification) and by CSCS certified banksmen.
6	Lifting equipment shall undergo visual inspection once every six months and will be documented on Statutory Form GA1. Records of GA1's shall be kept on file at the head office and documented on the Lifting Equipment Control Register.
7	Subcontractors / third parties using lifting equipment as part of a Murjoy Limited project will be required to supply details of certification prior to works commencing.
8	The Site Manager will ensure the necessary measures are in place to ensure lifting procedures i.e. lifting plans, appointment of competent persons etc.
9	Cranes that are to be set up to carry out lifting operations are levelled and consolidated. Where mobile cranes must be used in areas where there are underground ducts, drains, basements or where there is doubt of the bearing capacity of the ground, an Engineer must be asked to confirm the area is suitable or additional precautions must be taken.
10	Where adverse weather conditions could affect the safety of lifting operations, the Site Manager/Driver must stop operations until conditions improve.
11	Only authorised Operatives will be permitted to operate lifting appliances, to sling loads or give signals. Where there is any doubt of the competency of the authorised Operatives, the Site Manager must be informed immediately.
12	Any defect noted in any lifting appliance machine, gear or tackle must be reported immediately to foreman and taken out of use if the defect could affect its safe use.
13	All personnel working with or near lifting appliances must exercise due care and caution.
14	Loose items must be secured or fully covered when being handled by a lifting appliance.
15	Rubbish skips must not be lifted by a lifting appliance unless the skip is designed and marked as being suitable for lifting purposes.
16	Do not use lifting equipment in high winds i.e. winds speeds <75 kmph
17	Ensure that the SWL is marked on the lifting appliance and the weight of the load is known before the lift.

SOP 002 - Lifting Operations

Ref	Description
0	Lifting Equipment is the term used for any and all items used in lifting operations including but not limited to chains, slings, eyebolts, clutches, forks, etc.
1	All lifts must be in accordance with a Risk Assessment, Common Lifts Plan or a specific Method Statement. All lifts must be properly planned, appropriately supervised and carried out in a safe manner.
2	Every crane and lifting appliance must be properly made and strong enough for the work in which it is intended. Foundations, stages, scaffolds, and anchorages, etc., which have to carry a load must be of good construction and adequate strength. Winch frames must be made of metal. Separate crane jibs must be clearly marked to identify from which crane it belongs.
3	Platforms for crane drivers and signallers must be large enough to allow the man to do his work properly, close boarded or plated and fitted with an access ladder or steps. Platforms shall be equipped with handrails at least 950 mm high and toe-boards, minimum 150mm high. The space between handrail and toe-board must not exceed 470mm. Guard-rails and toe-boards may be removed for temporary access.
4	A crane shall be provided with a cabin to give the driver protection from the weather. The cabin shall afford an unrestricted view and permit access to machinery for maintenance. Where possible it shall be heated in cold weather. Cabins are not required when the plant is indoors or otherwise protected, or when the crane is used for short periods only, in the case of a hoist, it can be operated from a landing platform or inside the cage.
5	The size of a drum or pulley must match the size of the rope or chain. The rope or chain must be anchored to the drum and there shall be never less than two dead turns on the drum. Brakes and Controls, etc Cranes, winches shall be fitted with brakes capable of holding and controlling the maximum load. Controls on all lifting devices shall be clearly marked and designed so that they cannot be operated accidentally.
6	Ladders, platforms handholds etc., shall be provided to give safe access to all parts of the crane or lifting appliance that need inspection or regular maintenance, or from which an operator may fall from height.
7	Where a crane is hired, the responsibility for ensuring that a copy of the examination certificate accompanies the crane lies with the Hire Company. This company will ensure that if the crane hired is a Tower Crane then it is thoroughly examined after installation and before use.
8	The Site Engineer shall decide on the siting of any crane or other lifting appliances, but in the case of a mobile crane, the operator is responsible for ensuring that the movement and position of the crane is both safe and suitable.

SOP 002 - Lifting Operations

Ref	Description

9. The crane operator shall check that any ramps, slopes, gates, archways, building, trees or overhead lines do not present an obstacle or danger, and the refuelling or other service vehicles can gain access without causing a hazard.

10 A 600mm wideclearance between travelling or slewing cranes, and any fixture shall be maintained. Where this is not practical, barriers shall enclose any place where a man might be trapped.

11 Particular care shall be taken when placing cranes near overhead power cables. The jib or boom does not need to touch a live power cable, a flash over can occur over some distance depending on voltage. If the minimum safe working distance cannot be maintained, the electricity supply shall be switched off or otherwise disconnected by an authorised engineer.

12 The danger area shall be clearly marked off with stakes, flags etc., and where it is necessary to pass below overhead power cables, goal posts shall be set up to indicate the maximum clearance height, as specified by the local electricity supply authority. Materials shall not be deposited in this area.

13 A crane shall have a stable and level base. Care shall be taken to see that the ground is firm and stable. Excavation, which may not have been correctly filled in, cellars, tunnels and shafts may all reduce the stability of the ground and constitute a hazard to machinery and heavy loads. The same principles apply when a crane is sited on a street or roadway for the purposes of working into a site.

14 Adverse weather and strong winds can rapidly affect the stability of a crane. No crane shall be used without these factors first being checked.

15 The rigging/de-rigging of a crane shall only be carried out under the supervision of a competent person, normally the crane operator, and as recommended by the manufacturer.

16 Automatic safe load indicators, radius load indicators and motion limit switches, together with their audio-visual warning systems shall be fitted to cranes and other lifting appliances. All cranes and other lifting appliances shall be clearly marked with their maximum safe working load (SWL).

17 If the driver cannot see his load during the whole lifting operation, he shall have one or more trained slinger/signallers (Banksman) or some other signalling system to enable him to handle the load safely.

SOP 003 Crane Operation

Ref	Description
0	Only CSCS trained and competent persons shall operate cranes.
1	Drivers will be required to read and understand the operator's manual and load chart before attempting to do any work with or on any crane.
2	Capacity charts or signs shall be placed, so they may be seen and read.
3	Statutory inspections shall be carried out periodically, and certification filed on site.
3	The operator must remain in the cab and at the controls any time a load is suspended.
4	Always use the grab irons and steps to get on or off of the crane. Never jump off of the machine.
5	Hooks on blocks and snatch blocks will have a safety latch.
6	Make sure that all controls are in the neutral position and that all brakes are set before starting the crane. Never start the crane unless you are sitting in the operator's seat.
7	Allow the crane's engine and hydraulics to warm up before attempting to move or operate the crane.
8	Hooks on loading equipment shall be inspected for defects.
9	Check all controls (steering, transmission, brakes, hoist, boom hoist, swing, etc.) for proper function before placing the machine into operation.
10	Carefully inspect the area around the crane for obstructions. Never allow any part of the crane to come closer than ten metres from a power line. Make sure there is adequate support for the crane and load before you attempt to make a lift. Use cribbing under the outrigger floats if necessary.
11	Always consult the load chart before you attempt a lift. Do not exceed the capacities on the chart. Barricade or restrict access to the area within the swing radius of the house to prevent injury. When picking up loads using chains or slings the load hook shall be centered to the load. When picking loads, tag lines shall be used to guide the load.
12	Slings and chains shall be adequate to hold the weight of products being lifted.
13	Employees will not ride the loads.
14	Hold tension on the cable when reeling in or out on the equipment.
15	Lower all raised equipment to the ground and set all brakes before exiting the crane.
16	Turn off the engine and allow the machine to cool before working on the machine.

SOP 004 Telehandler Operation

Ref	Description
0	Only CSCS trained and authorized operators shall be permitted to operate a Telehandler.
1	Perform a walk-around inspection of the Telehandler before each use. Make sure that all safety devices are in place and functioning properly, including the back-up alarm.
2	USE YOUR SEATBELT!
3	Passengers are not allowed to ride on a Telehandler.
4	Arms or legs are prohibited from being placed between the uprights of the mast or outside the running lines of the Telehandler.
5	When a Telehandler is left unattended, the load engaging means shall be fully lowered, controls shall be neutralized, power shall be shut off, and brakes set. Wheels shall be blocked if the Telehandler is parked on an incline.
6	A Telehandler is unattended when the operator is 25 ft. or more away from the vehicle which remains in his view, or whenever the operator leaves the vehicle and it is not in his view.
7	When the operator of a Telehandler is dismounted and within 25 ft. of the Telehandler still in his view, the load engaging means shall be fully lowered, controls neutralized, and the brakes set to prevent movement.
8	There shall be sufficient headroom under overhead installations, lights, pipes, sprinkler system, etc.
9	An overhead guard shall be used as protection against falling objects.
10	Only approved Telehandlers shall be used in hazardous locations.
11	Whenever a Telehandler is equipped with vertical only or vertical and horizontal controls elevatable with the lifting carriage or forks for lifting personnel, the following additional precautions shall be taken for the protection or personnel being elevated. a. Use of a safety platform firmly secured to the lifting carriage. b. Means shall be provided whereby personnel on the platform can shut off power to the truck. c. Such protection from falling objects as indicated necessary by the operating conditions should be provided.
12	The driver shall be required to look in the direction of, and keep a clear view of the path of travel.
13	Grades shall be ascended or descended slowly.
14	When ascending or descending grades in excess of 10 percent, loaded Telehandlers shall be driven with the load upgrade.
15	Stunt driving and horseplay is not permitted.

SOP 005 Slings and Rigging

Ref	Description
0	Employees will be properly and thoroughly trained in the use of slings and rigging.
1	The entire length of the sling must be visually inspected prior to use, at regular intervals, and after any incident. Clean the sling before inspecting it. Dirt and grime can hide damage, especially on chain and wire rope. Slings will be relaxed when you inspect them. Damaged or defective slings must be discarded. When disposing of defective or damaged slings cut the sling in half or otherwise destroy it so there is no danger of it being reused.
2	When inspecting steel alloy chain slings, pay special attention to nicks, gouges, cracks, corrosion pits, stretching, and distorted or worn fittings. Replace the entire sling if any part is damaged, has more than 10% wear or 5% stretch, and if the hook is twisted more than 10 degrees or opened up more than 15% at the throat.
3	Wire rope slings must be replaced if there is severe corrosion, localized wear (shiny worn spots), a 1/3 reduction in outer wire diameter, excessive stretching, damage or displacement of end fittings, more than 10 broken wires in one lay, or evidence of damage to the rope structure such as kinking, crushing, birdcaging, or other distortion.
4	Do not use synthetic web slings that have burns, broken or worn stitches, excessive stretch, exposed warning stitches (usually red yarn), snags, punctures, tears or cuts, or distorted fittings.
5	Inspect for broken wires in metal mesh slings, lack of sling flexibility, kinks or twists in the edge, 25% reduction in wire diameter due to abrasion, and broken brazed joints or welds on the edge.
6	Store slings vertically on a rack of wall to minimize the risk of damage and for easy access.
7	Lift only from solid attachment points.
8	Before making the lift, make sure the weight and balance of the load are known and the sling is securely positioned around the load.
9	Guard against shock loading by taking up slack in the sling slowly.
10	Operators must know and must not exceed the working load limit (rated capacity) of the sling.
11	The working load limit is calculated by dividing the breaking strength of the sling by five.
12	Do not lift items that exceed the working load limits of the sling.

SOP 006 - Scaffolding

Ref	Description
0	All scaffolding to be erected in accordance with the HSA Scaffolding Code of Practice 2009 & the 2013 Construction Regulation
1	A competent person must inspect the scaffolding regularly. i.e. at least once a week and always or after bad weather. The results of inspections will be recorded (including defects that were put right during the inspections) in the GA3 form and the records signed by the person who carried out the inspections.
2	Scaffolding may only be erected, altered and dismantled by competent persons holding CSCS certificates in advanced scaffolding erection.
3	Competent persons must have a minimum of the CSCS certification for 'scaffolding -basic' card for scaffold erection which is issued by FAS, the Training & Employment Authority. Advanced CSCS certified scaffolders required to erect scaffolding over 7 metres as per Safety, Health and Welfare at Work (Construction) Regulations, 2013 (SI 291).
4	Boards will be free from obvious defects such as knots, and arranged to avoid tipping or tripping.
5	Adequate guard rails and toe boards, at every side from which a person could fall, will be erected and in particular where one can fall from heights.
6	Scaffolds must be tied rigidly to a structure if heavy materials are to be lifted on to the scaffold.
7	Scaffolding should only be used if they are structurally complete. Otherwise if incomplete, a warning notice fixed or the scaffold dismantled.
8	Contractors should only use their own scaffolding or scaffolding they have specific permission to use. If in doubt about the ownership of a scaffold don't use it.
9	Access ladders must be provided and used on all scaffolds. Climbing up on the scaffold is strictly prohibited on site.
10	Guard-rails are to be provided in all cases for scaffolds where work is in progress and toe boards must be fitted.
11	Ties provide protection against toppling. Ties are secured at the junction of the vertical and horizontal scaffold members. They must be of rigid construction. A positive anchor is required. The top guy, tie or brace of completed scaffolds shall be placed no further than the 4:1 height from the top.
12	Guys, ties, and braces must be installed according to the scaffold manufacturer's recommendations or at the closest horizontal member to the 4:1 height and be repeated vertically at locations of horizontal members every 20 feet or less thereafter for scaffolds 3 feet wide or less, and every 26 feet or less thereafter for scaffolds greater than 3 feet wide.
13	Such guys, ties and braces shall be installed at each end of the scaffold and at horizontal intervals not to exceed 30 feet (measured from one end [not both] towards the other).
14	Side brackets can be used with all metal frame scaffolds. Manufacturers determine the requirements. Side brackets are designed only to support personnel unless engineered otherwise.
15	If you find that a scaffold is unsafe report the faults to your supervisor so he can have them put right.
16	Works to cease on scaffolding until such a time as the matters have been rectified by competent scaffolders and form GA3 signed off.

SOP 007 Mobile Scaffolds

Ref	Description
0	All scaffolding to be erected in accordance with the HSA Scaffolding Code of Practice 2009 & the 2013 Construction Regulations
1	Scaffolding may only be erected, altered and dismantled by competent persons holding CSCS certificates in mobile scaffolding erection.
2	Competent persons must have a minimum of the CSCS certification for mobile scaffolding which is issued by FAS, the Training & Employment Authority.
3	Appropriate measures to be taken by those erecting scaffolding to prevent falls from height.
4	Mobile tower scaffolds must be tied rigidly to a structure if heavy materials are to be lifted up the outside of the tower or the height to least base ratio exceeds 3:5:1. Height measured from ground level to working platform. Least base width=shorter side of tower.
5	Adequate guard rails and toe boards, at every side from which a person could fall, will be erected and in particular where one can fall from heights.
6	Mobile Scaffolds must be fitted with lockable castors, and if required (dependant on height) outriggers.
7	Mobile Scaffolding should only be used if they are structurally complete. Otherwise if incomplete, a warning notice fixed or the scaffold dismantled.
8	Contractors should only use their own mobile scaffolding or scaffolding they have specific permission to use. If in doubt about the ownership of a scaffold don't use it.
9	Access ladders must be provided and used on all mobile scaffolds. Climbing up on the scaffold is strictly prohibited on site.
10	Guard-rails are to be provided in all cases for mobile scaffolds where work is in progress and toe boards must be fitted.
11	Employees working from mobile scaffolding are not permitted work above the height of the top handrail.
12	Mobile tower scaffolding may also be transported to various locations (as required) when the working platform is not occupied and when there are no overhead hazards along the way i.e. overhead electricity lines.
13	Wheels are to be locked at all times on mobile tower scaffolds. Brakes should only be disengaged whilst moving scaffolds and re-engaged immediately afterwards.
14	Prior to setting up mobile scaffolding at new location, operators must ensure that the ground is level, castors are locked out, and area is safe to commence works.
15	If you find that a scaffold is unsafe report the faults to your supervisor so he can have them put right.
16	Works to cease on mobile scaffolding until such a time as the matters have been rectified by a competent scaffolders and form GA3 signed off.

SOP 008 - Steel Fixing

Ref	Description
0	Steel fixing works on site shall be as per the contract drawings and engineers specification.
1	Steel fixers shall wear appropriate PPE at all times when carrying out there works incl. hard hats, boots, high visibility vests, gloves, glasses etc.
2	Only steel fixers who have completed abrasive wheels training shall be permitted to select, mount and operate abrasive wheels on site.
3	When cutting steel with an angle grinder operators must wear safety glasses along with a full-face visor.
4	Prefabrication areas to be fenced off or adequately highlighted to other plant, machinery and operators in the area or likely to be in close proximity to the area.
5	Steel fixers may need the use of trestles etc. when fabricating steel columns.
6	All works involving the lifting / lowering of large sections of steel beams etc. shall be carried out using a lifting appliance i.e. on site crane, teleporter and always under the instruction of a competent banksman.
7	Transporting of sections of beams etc. from prefabrication area to site shall be done so using a lifting appliance i.e. on site crane, teleporter etc. Again, slinging, signalling of the loads shall be done so by a competent banksman.
8	Exposed rebar to be fitted with protective rebar caps, to ensure other site personnel do not suffer a puncture wound.
9	Rebar caps only to be removed at the same time as continuation works are to be carried out. At no stage shall exposed rebar be left unattended.
10	Work at heights to be carried out from scaffolding, mobile towers, mobile elevated working platforms etc.
11	Edge protection to be provided when persons are required to work at height greater than two metres.
12.	Ensure good access to and from all works.

SOP 009 Concrete Works

Ref	Description
0	Concrete works including pours shall be supervised by competent persons at all times.
1	Wear suitable PPE including dust mask, overalls, gloves, safety boots & safety glasses. Wet concrete workers to wear wellington boots.
2	MSDS to be kept on file & on site in case of emergency.
3	Prior to concreting precautions must be taken including: 1. Safe access provided. 2. Compressed air lances must be fitted with suitable control valves. 3. Debris directed away from other persons. 4. Those using lances & other persons near by must wear eye protection.
4	Concreting should not start until falsework / formwork has been checked by a competent person & all preparations are completed.
5	Concrete must never be poured too rapidly or from such a height as to overload the falsework or formwork.
6	Stability of the framework must be checked as the concrete pouring proceeds.
7	Discharge of concrete from skip must be controlled from suitable & safe platforms, taking account of the tendency of side discharge skips to kick backwards if discharged rapidly.
8	A properly trained banks man or signaler should be appointed to ensure good communication between the crane driver & the concrete workers.
9	When using concrete vibrators the following precautions must be taken - 1. Vibrator motors on elevated platforms must be firmly secure. 2. Poker vibrators must not be allowed to come into contact with any persons. 3. Guards to vibrator motor starting shafts must be in place when the engine is running. 4. Adequate ventilation must be provided if vibrator motor is operated in confined spaces.

SOP 010 Temporary Works

Ref	Description

0 Temporary Works (false/formworks) is any temporary structure used to support a permanent structure while it is not self supporting (e.g. wet concrete prior to curing to the required strength).

1 Any failure of temporary works may lead to a collapse of the permanent structure; this could cause serious injuring to those working on or near to it. Typical examples of temporary works are:

- Access platforms.
- Scaffold.
- False/formwork structures.
- Flying tables.

2 On all Murjoy Limited's Projects, the Temporary Works Designer shall produce drawings and calculations for submission to the Main Contractor's Temporary Works Department/Co-ordinator prior to works commencing. Works shall not commence until Murjoy Limited has received written approval from the Main Contractor's Temporary Works Department/ Co-ordinator.

3 The correct design of temporary works is fundamental to safety during its erection and dismantling including the prevention of collapse during construction works. In addition to the requirements of the finished structure the design of the false/formwork must take into account the loads imposed on it during the construction process and how these are transferred into the ground.

4 Typical loads the design must take account of may include:

- Self load.
- Wet (green) concrete loading including reinforcement.
- Inclement weather including, snow, ice, un-discharged rain water and wind loads including up lift and downward pressures as well as horizontal pressures.
- Dynamic loads Plant (possibly dumpers and cranes etc.).
- Concrete pump surges.
- Personnel.
- Stored material loads.

5 On all Murjoy Limited's Projects, all temporary works shall be supervised by the General Foreman. Prior to erection begins, a method statement and risk assessment shall be produced to establish how the hazards will be managed, all associated operatives shall read, understand and sign the method statement.

SOP 010 Temporary Works

Ref	Description

6 In addition to potential collapse, the method statement must include issues such as:

- Persons or objects falling from height.
- Edge protection.
- Access.
- Weather conditions.
- Working with concrete and other chemicals.
- Lifting operations.

7 The erection team must use "working drawings" only and not use "preliminary drawings", they should also know:

- Where to start.
- Whether the equipment is the same as that ordered.
- At what stage checks or permits are required.
- Whether checks and permits have already been carried out or issued.

8 Once completed and ready to load (with reinforced steel, concrete etc.) the temporary works shall be inspected, usually within the clients permit to load systems. Additional inspections shall be undertaken at a frequency enough to enable any faults to be rectified promptly.

9 Prior to dismantling the Temporary Works Co-ordinator (Usually the clients) gives permission to strike/dismantle by issuing a "permit to strike". During striking the General foreman and

SOP 011 Safe Access / Egress

Ref	Description
0	All employees have a duty to ensure that their work area is maintained in a clean and tidy manner at all times.
1	This entails ensuring that waste materials are cleared up as work proceeds, and keeping materials and waste in their correct location.
2	Everyone on site is responsible for the tidiness of the site. This means that everyone must ensure that their work area is maintained in a clean and tidy manner, and that all waste and materials are removed and stored to their correct locations.
3	Adequate lighting must be provided to all work areas. Foreman shall ensure this is in place.
4	All edges where a person can fall from heights must be fitted with a suitable barrier, and have toe boards fitted if persons are working below.
5	All ladders on site must be securely tied or footed. All ladders must project 1m above the landing place. Broken/damaged ladders are not to be used on site and should be removed for repair or disposal by the person discovering such defects.
6	Materials must be stacked in such a way so as not to pose a danger of falling on persons. Brick /block stacks must be safely positioned and be stable.
7	All holes must be securely covered when work is not being carried out in that area.
8	All timber must be de-nailed on site, and sharp objects disposed of immediately.
9	All persons on site must wear a safety helmet to minimise the risk of being struck by a falling object, and safety boots to protect feet from heavy objects falling onto them, and to protect them from sharp objects on the ground.

SOP 012 Work at Heights

Ref	Description

0 Work at height is the term used to describe all works where Murjoy employees, subcontractors, clients and members of the public are at risk of falling from a height as a result of our acts or omissions.

1 Murjoy shall work in accordance with the requirements of the Safety, Health & Welfare at Work (General Applications) Regulations 2007-2016 – Part 4 Work at Heights.

2 Murjoy shall ensure that:

- All work at height is properly planned and appropriately supervised;
- Those working at height are competent;
- The place where work at height is done is safe;
- The risks from fragile surfaces are properly controlled;
- Equipment for work at height is suitable and properly inspected and maintained;
- The weather conditions are taken into account and all work is stopped if weather conditions endanger health or safety.
- Procedures in case of emergency are planned.

3 The site foreman shall attend the site to identify the various hazards associated with the project and produce a risk assessment identifying clearly, the controls required.

4 A set of control measures shall be produced so as to prevent falls from heights using the General Principles of Prevention outlined below.

- The avoidance of risks.
- The evaluation of unavoidable risks.
- The combating of risks at source.
- The adaptation of work to the individual, especially as regards the design of places of work, the choice of work equipment and the choice of systems of work, with a view, in particular, to alleviating monotonous work and work at a predetermined work rate and to reducing the effect of this work on health.
- The adaptation of the place of work to technical progress.
- The replacement of dangerous articles, substances or systems of work by safe or less dangerous articles, substances or systems of work.
- The giving of priority to collective protective measures over individual protective measures.
- The development of an adequate prevention policy in relation to safety, health and welfare at work, which takes account of technology, organisation of work, working conditions, social factors and the influence of factors related to the working environment.
- The giving of appropriate training and instructions to employees.

SOP 012 Work at Heights

Ref	Description
5	As part of the hazard identification, work at height issues shall be addressed including works adjacent to deep excavations, from MEWP's, scaffolding, ladders etc.
6	Method Statements, Construction Stage Health & Safety Plans, Site Specific Safety Statements etc. shall incorporate these control measures so as to ensure works at height are carried out safely and without risk of falls
7	Murjoy foreman shall ensure that all equipment involved in these works comply with the relevant standard, and is fit for its purpose and will provide adequate supervision and assistance.
8	Periodic inspections of work at height equipment shall be carried out by competent persons as per the Statutory Inspection Matrix. With relevant copies held on site for duration of works and then returned to the Murjoy Limited head office.
9	All access equipment (teleporter with man basket, MEWP's etc.) shall be certified in accordance with the General Applications Regulations 2007-2016 with competent persons operating the equipment.
10	Scaffolding shall be erected in accordance with the Approved Code of Practice for Access & Working Scaffolds by CSCS certified scaffolders. Scaffolding shall be inspected weekly as per the Statutory Inspection Matrix and documented on Form GA3.
11	Ladders shall only be used for short duration only and shall be inspected weekly as per the requirements of Part 4 of the Safety, Health & Welfare at Work (General Applications) Regs 2007-2016.
12	When using harnesses, only certified harnesses may be used by trained and competent individuals.

SOP 013 Confined Spaces

Ref	Description

0 A confined space can be any space of an enclosed nature where there is a risk of death or serious injury from hazardous substances or dangerous conditions (eg lack of oxygen). Some confined spaces are fairly easy to identify, eg enclosures with limited openings:

- storage tanks;
- silos;
- reaction vessels;
- enclosed drains;
- sewers.
- Open topped chambers;
- vats;
- combustion chambers in furnaces etc;
- ductwork;
- unventilated or poorly ventilated rooms.

1 A risk assessment of all confined space entry shall be conducted by a competent person.

2 A Confined Space Entry Supervisor shall be appointed and shall be given responsibility to ensure that the necessary precautions are taken, to check safety at each stage and may need to remain present while work is underway.

3 All persons involved in confined space entry will undergo appropriate training prior to works.

4 Mechanical and electrical isolation of equipment is essential if it could otherwise operate, or be operated, inadvertently. If gas, fume or vapour could enter the confined space, physical isolation of pipework etc needs to be made. In all cases a check should be made to ensure isolation is effective.

5 Cleaning before entry may be necessary to ensure fumes do not develop from residues etc while the work is being done. This will be coordinated by the Confined Space Entry Supervisor.

6 Entrance to be checked prior to works commencing to ensure it is big enough to allow workers wearing all the necessary equipment to climb in and out easily, and provide ready access and egress in an emergency. For example, the size of the opening may mean choosing airline breathing apparatus in place of self-contained equipment which is more bulky and therefore likely to restrict ready passage.

7 Provision of ventilation must be considered, possibly through increasing the number of openings and therefore improve ventilation. Mechanical ventilation may be necessary to ensure an adequate supply of fresh air. This is essential where portable gas cylinders and diesel fuelled equipment are used inside the space because of the dangers from build up of engine exhaust. Warning: carbon monoxide in the exhaust from petrol fuelled engines is so dangerous that use of such equipment in confined spaces should never be allowed.

SOP 013 Confined Spaces

Ref	Description

8 Air to be tested also to check that it is free from both toxic and flammable vapours and that it is fit to breathe. Testing should be carried out by a competent person using a suitable gas detector which is correctly calibrated. Where the risk assessment indicates that conditions may change, or as a further precaution, continuous monitoring of the air may be necessary.

9 Provision of special tools and lighting required in some instances including nonsparking tools and specially protected lighting are essential where flammable or potentially explosive atmospheres are likely. In certain confined spaces (eg inside metal tanks) suitable precautions to prevent electric shock include use of extra low voltage equipment (typically less than 25 V) and, where necessary, residual current devices.

10 Provision of breathing apparatus may be required if the air inside the space cannot be made fit to breathe because of gas, fume or vapour present, or lack of oxygen. Never try to 'sweeten' the air in a confined space with oxygen as this can greatly increase the risk of a fire or explosion.

11 Preparation of emergency arrangements will be the duty of the competent person and will need to cover the necessary equipment, training and practice drills.

12 Provision of rescue harnesses may be required including Lifelines attached to harnesses that run back to a point outside the confined space.

13 An adequate communications system shall be provided to enable communication between people inside and outside the confined space and to summon help in an emergency.

14 A watchman shall be positioned outside to keep watch and to communicate with anyone inside, raise the alarm quickly in an emergency, and take charge of the rescue procedures.

15 A permit to work system shall be in operation in most cases. A permit to work ensures a formal check is undertaken to ensure all the elements of a safe system of work are in place before people are allowed to enter or work in the confined space. It is also a means of communication between site management, supervisors, and those carrying out the hazardous work. Essential features of a permit to work are:

- clear identification of who may authorise particular jobs (and any limits to their authority) and who is responsible for specifying the necessary precautions (eg isolation, air testing, emergency arrangements etc);
- provision for ensuring that contractors engaged to carry out work are included;
- training and instruction in the issue of permits;
- monitoring and auditing to ensure that the system works as intended.

SOP 014 Electricity on Site

Ref	Description
0	Electricity and electrical installations on site shall be treated with the utmost care and be under the control and supervision of experienced competent persons.
1	The local electricity supply or site generator shall supply electricity where public supply is not practicable or uneconomic.
2	Written application to the ESB shall be as soon as possible at the planning stage.
3	When a Generator is used, attention shall be given to sitting in order to minimise noise and fumes. Private generating plant must be installed in accordance with BS 1017.
4	Portable electrical appliances are equipment which are supplied with a connector/plug and are connected to temporary or permanent power supplies, cables and accessories are also tested.
5	It is the responsibility of the Site Management to request that his site equipment is PAT tested; it is the responsibility of the Health & Safety Coordinator to arrange for the inspection and testing of all of the company's portable electrical equipment.
6	There is a constant risk of electric shock whilst on site. Therefore, 110V systems for tools, temporary lighting and other equipment should be used when possible.
7	Routine inspection and preventative maintenance are essential. Inspection results should be recorded and "due date" labels attached to the equipment.
8	In the event of an over due test date label, the equipment must be quarantined and either a replacement sought or arrange for the equipment to be tested.
9	All tools and equipment shall be inspected by a competent person for signs of damage or deterioration and removed from service if found to be unserviceable.
10	Before using any item of electrical equipment a daily visual check must be carried out to ensure that there are no broken plugs or machine casings which expose connectors, cables which are split, cracked or have thin insulation.
11	All cables and installations must be inspected regularly, where there are signs of damage they must be taken out of use.
12	All cables and connections must be of an industrial standard and suitably protected from accidental damage.
13	Report any defects noted to tools and machinery immediately to supervision so that they may be remedied.
14	Under no circumstances is insulation tape to be used to repair or joint cables.
15	Ensure that only 110V is used to operate portable tools.
16	At step-down transformers ensure that the lead from the mains supply board to the transformer is 1m or less and is armoured.
17	Transformers must be located away from areas that are damp or there is a risk of encountering wet conditions.

SOP 015 Overhead Electricity Lines on Site

Ref	Description

0 Murjoy will endeavour to apply for overhead powerlines to be switched out well in advance of any works. Where this is not possible the following procedure shall apply.

1 Where switching out or diverting the overhead electricity line is not practicable or where initial site works must be carried out before the line can be diverted or undergrounded, then other protective measures must be put in place to prevent accidents when working in the vicinity of live overhead electricity lines.

2 Murjoy Limited shall take suitable measures dependant on the nature of the work and the voltage of the overhead lines.

3 Sites where there will be no work or passage of plant under or in the Hazard Zone of a live overhead line. Here suitable barriers, bunting and warning signs are required to prevent inadvertent breach of the Hazard Zone as shown below:

4 Murjoy Limited Sites where plant will pass under a live overhead line. Here, defined "Crossing Points" must be established under the line in addition to the provision of barriers, bunting and warning signs. Where more than one Crossing Point exists, each Crossing Point shall be identified by a unique identification number for maintenance purposes.

5 Work in the Hazard Zone of live overhead electricity lines including the use of specified equipment may be allowed in certain very limited circumstances. The work that may be carried out can be categorized as follows:

- Work not requiring prior consultation with ESB Networks (other than line voltage verification).
- Work that can only be carried out following consultation with ESB Networks.

6 Work may be carried out in the Hazard Zone if the work does not involve the use of plant, equipment or activities which could cause the Exclusion Zone for the relevant voltage to be breached. Depending on the equipment and the height of the line, this might include the use of a bulldozer, small front tipping dumpers, mini diggers Etc.

7 Prior to deciding what work can be carried out in these circumstances, the foreman will ensure that a site specific written Risk Assessment and Work Method Statement has been carried out covering issues such as:

- Height of the line (taking into account possible sag);
- Maximum potential height that can be reached by the equipment (ignoring any mechanical, electronic or electromechanical height limiters that may be fitted to the equipment);
- Possible impact of changing ground levels within the Hazard Zone on the height of the line;
- Possible impact on line support structures such as poles, towers, stay wires etc.;

SOP 015 Overhead Electricity Lines on Site

Ref	Description

8 Work that can only be carried out following consultation with ESB Networks. Where it is not practicable to switch-out and earth the line, the following are the minimum precautions that must be adhered to while working in the Hazard Zone:

- A written Risk Assessment and Work Method Statement must be prepared in consultation with the persons about to undertake the work.
- A daily Permit to Work system shall be initiated by Murjoy Limited and be operational.
- The work equipment, such as excavators, must be operated with certified mechanical, electronic or electromechanical limiters to prevent any part of the equipment breaching the relevant Exclusion Zone.
- The limits to which the equipment can operate must be clarified in the Risk Assessment taking into account features such as line sag and changing ground levels.
- On site, these limits should be set and fixed by a competent person and verified by testing.
- Unauthorised tampering with the limits must be prevented by the use of appropriate management systems.
- A dedicated observer must be in place for each item of plant and equipment. The dedicated observer must be in communication with the machine operator at all times and must not undertake any other work activity while work in the Hazard Zone is in progress.

9 Regular inspections shall be carried out on all control measures implemented by Murjoy Limited both on site and at the yard, so as to prevent any potential contact with overhead lines. This will include goalposts, bunting, warning signage, line markings etc.

SOP 016 Excavations

Ref	Description

0 Before excavation works commence, Murjoy shall:

- Appoint competent person to supervise work;
- Ensure method statement for the works in read and signed by all involved;
- Find, locate and mark all underground services;
- Verify ground conditions and soil type before excavating so as to avoid collapse;
- No ground to be considered safe until investigated by a competent person taking into account weather conditions;
- Schedule work so that excavations are not open for any longer than necessary;
- Ensure adjacent buildings, roads, footpaths and scaffolds, etc. are not undermined;
- Organise suitable certified plant, equipment and required working space;
- Organise suitably competent operators i.e. CSCS & Safe Pass
- Organise delivery and inspection of support materials and ladders;
- Provide suitable barriers so as to prevent unauthorized access to the area;

1 During excavation works:

- Arrange documented inspections using Approved Form AF3;
- Excavations 1.25m or deeper are shored or sloped back to an angle of repose. Any excavation in unsuitable soil is shored or sloped back even if less than 1.25m. For deep excavations the sides have to be benched or adequate trench boxes, supports used.
- Avoid overcrowding in a trench;
- Arrange adequate fencing, lighting, ladder access, and warning signs around the excavations;
- Arrange safety stops for all site transport near trench areas or excavations;
- Where vehicles or equipment operate near excavations, the sides are shored or braced to withstand the forces exerted by any superimposed load. Also stop blocks or other substantial barricades are installed at the edges of such excavations.
- Plan and prepare for safe backfilling activities;
- Maintain tidy work areas at all times;
- Materials used for sheeting, shoring or bracing are in good condition. Timbers are sound, free of large or loose knots, and are of adequate dimensions.
- Safe access and egress is provided for all excavations by means of ladders, stairs or ramps.

2 Edge protection must be fitted to an excavation which can also pose a risk of falls from height, or to ANY excavation in a public area.

3 Materials and spoil heaps should be stored at least 1.5m from the edge of the trench.

4 Safety helmets, safety boots and gloves will be worn to prevent injury from props, pipes, machinery and other objects.

5 Persons should not enter the trench when heavy machinery or loaded trucks are positioned beside the trench.

SOP 017 Fire

Ref	Description
0	All stairwells and access routes shall be kept clear of waste and materials for the duration of the project so as to reduce the potential risk of fire occurring and to aid evacuation in the event of fire.
1	Don't hang clothes over or near heating equipment.
2	Don't let paper, oily rags or other rubbish accumulate on site, clean as you go.
3	Don't smoke in prohibited areas.
4	Use proper sealed containers for flammable liquids.
5	Don't overload sockets, one socket one plug.
6	Check for flammable materials nearby before using blow lamps, welding, and cutting equipment. Keep flammable liquids away from sources of ignition.
7	Switch off at mains any electrical equipment not in use.
8	Make sure you know what to do in case of fire.
9	Make sure you know the escape routes in your particular area.
10	Don't obstruct fire extinguishers.
11	Ensure that you know how to operate extinguishers.
12	If you discover a fire alert the site office and / or the fire brigade.
13	Evacuate the building or area you are working in.
14	Fight the fire with the extinguishers provided, provided that you have been trained.
15	Don't put yourself at risk.
16	Don't use water to put our electrical fires.

SOP 018 Fire Emergency

Ref	Description
0	Familiarize yourself with the location of the evacuation routes (primary and secondary), first aid station or kit, each fire alarm, each fire extinguisher, the nearest public telephone, and the location of the stairway (as indicated on the Emergency Evacuation Diagrams).
1	Should you discover fire anywhere in the building, immediately raise the alarm and call the fire brigade (999 or 112 if available). State your name, location, and type of fire.
2	Only consider attempting to extinguish a fire if it is very minor and you have been trained in the proper operation and use of portable fire extinguishers.
3	When the fire alarm sounds, immediately leave the area using your designated evacuation route.
4	When evacuating do not use elevators, keep to the right, walk – do not run, and remain calm but take immediate action.
5	Stay in single file in the stairways, as fire brigade may be coming up the same stairway.
6	A preplanned procedure has been established to assist non-ambulatory individuals.
7	Obey the directions of your building Fire Warden.
8	Small fires can spread rapidly and overwhelm an area. To contain the fire, close all doors behind you as you exit the building.
9	If all exits from a floor are blocked or if for any reason you must remain in a room/office during a fire or other emergency, remain calm, call 911 (if available) and advise of your location and situation. Wait for the fire department to assist you.
10	Notify your supervisor in the event of injury to individuals.
11	Periodic fire drills will be conducted throughout the year; however, treat every alarm as if there were an actual fire.
12	After exiting the building get far away from the building, all staff members are to assemble in the car park for accountability. You should remain outside the building until the fire department or management staff informs you that it is safe to return to the building.
13	If all exits from a floor are blocked or if for any reason you must remain in a room/office during a fire or other emergency, remain calm, call 999 or 112 and advise of your location and situation. Wait for the fire department to assist you.
14	Notify your supervisor in the event of injury to individuals.
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17	You should remain outside the building until the fire department or management staff informs you that it is safe to return to the building.

SOP 019 Safe Use of Harness

Ref	Description
0	A harness is a form of Personal Protective Equipment (PPE) and should only be used in exceptional cases when it is reasonably practicable.
2	Only operatives trained in the correct use of harness will be permitted to use harnesses.
3	All harnesses must be individually inspected before, during and after use. Appropriate training shall be provided to all persons.
4	Full body harnesses should be adjusted to suit the user as per the supplier's instructions. 2m long lanyards, with a shock absorber capable of reducing the deceleration forces must be issued.
5	In order to safely use a 2m lanyard you must have a clear distance of at least 4m from the anchorage point to the ground. If there is not this distance available you must contact the Site Manager as further precautions shall be required.
6	No inertia reels (or longer lanyards) will be used unless site management has verified that adequate clearance is available. Lanyards MUST not be connected in series.
7	Storage of harnesses should be in a clean dry area free of any corrosive chemicals.
8	Due regard will be paid to the settling up operation , particularly ensuring that there is no approach within 2m of an unprotected edge before fall arrest is attached. Lanyards will remain connected until safe egress is reached.
9	Lines must not run over any sharp objects or edges.
10	Anchorages are to be clearly identified. They should be chest height or above with amount of slack in the line reduced to the minimum that is reasonable.
11	Any doubt about the capacity of an anchorage to withstand the relevant shock loading should be referred to a competent Engineer.
12	Rescue procedures must be detailed during the site specific induction and refresher sessions. A quick and smooth rescue is required to minimise the extent of injury when a person is suspended by harness. However, rescuers should avoid placing themselves at further risk. Self-rescue should only be attempted when it is safe to do so. Supervisory staff should first ensure that the effects of shock have been taken into account before self rescue is initiated.

SOP 020 Hazardous Substances

Ref	Description
0	Any substances carrying a warning label has the potential to cause harm – always read the labels and assess the risks before using the substance on site. Remember – ALWAYS follow the instructions for the safe use of Hazardous Substances on labels / Material Safety Data Sheets.
1	Chemical products must never be allowed to come into eye contact, and generally contact with the skin should be kept to a minimum.
2	Don't mix different chemicals or substances.
3	Wear the correct Personal Protective Equipment when using Hazardous Substances, e.g. dust / fume masks, gloves, goggles, overalls, etc.
4	Know where the first aid / washing facilities are on site.
5	Ensure that hazardous substances are stored in a secure location whilst not in use.
6	Don't store hazardous substances above head height, where they may fall on to others.
7	Make sure you have been trained to use the hazardous substances that you use on site.
8	Don't eat, drink, or smoke whilst using hazardous substances, and remember always to wash up afterwards.
9	Don't expose other workers who may be in the area to the hazardous substances you are using through fumes, gas or dust.
10	Ensure that all spillages are cleaned immediately and that waste and used containers are disposed of properly.

SOP 021 Housekeeping

Ref	Description
0	Look after your own area. Clear debris as you go. Do not leave hazards which place you or your work-mates at risk.
1	Everyone is entitled to a clear space of 600mm or more on gangways and working platforms.
2	Route cables and hoses away from passageways.
3	Pick up pallet bands once released.
4	Never allow sheeting, shutters, boxes of material etc. to obscure openings or gaps.
5	Small cylindrical items can be lethal on affirm surface e.g. off-cuts of re-bar or scaffold ties. Remove them immediately.
6	Adequate temporary lighting should be provided where needed – inform your Safety Representative or Site Management if not.
7	De-nail timber as the work progresses.
8	Protruding reinforcement bars should be cut or capped.
9	Never bomb material from a height.
10	Stack loose material in a way which prevents items falling.
11	Once unbanded, pallets should not be stacked too high.
12	Use brick- guards on scaffolds.
13	Close-board bottom lift of scaffold above doorways during work overhead.
14	Fire load increases enormously if housekeeping is neglected, especially during the later stages of site operations.
15	Keep fire escape routes clear of all obstructions, particularly combustible material.
16	Return flammable materials/gas cylinders to store after use. Always store them away from combustible material like polythene, cardboard and timber.
17	Treat cartridges as explosives – return all rounds to store.
18	Vermin will thrive if food litter (and nestling material) is available.
19	Remember that accidents are normally caused by the combination of several different factors. Although minor cuts or bruises are the most common result, failure to address a simple trip hazard could lead to broken bones or death.

SOP 022 Ladders

Ref	Description
0	Ladders should only be used when the job is of short duration and can be carried out safely from a ladder.
1	Ladders should be set out on a firm base and leaning at the correct angle.
2	Ladders must be tied near the top and extend at least 1m above the landing point.
3	If a ladder cannot be tied at the top it must be secured at the bottom.
4	Make sure that your footwear is free from mud/ grease before you climb a ladder.
5	Use both hands on the stiles of the ladder, and ALWAYS face the ladder.
6	NEVER OVERREACH on a ladder – ALWAYS move it.
7	DON'T stand a ladder on a drum, box or other unstable base.
8	NEVER carry loads up a ladder, always hoist it up.
9	NEVER try to repair damaged ladders – BIN them.
10	Ladders should only be used when the job is of short duration and can be carried out safely from a ladder.

SOP 023 Hand and Power Tools

Ref	Description
0	All tools, regardless of ownership, shall be of an approved type and maintained in good condition. (Tools are subject to inspection at any time. A supervisor has the authority and responsibility to condemn unsafe tools, regardless of ownership).
1	Unsafe tools shall be tagged with an unsafe tag to prevent their use.
2	Employees shall always use the proper tool for the job to be performed. Makeshift and substitute tools shall not be used.
3	Hammers with metal handles, screwdrivers with metal continuing through the handle, and metallic measuring tapes shall not be used on or near energized electrical circuit or equipment.
4	Tools shall not be thrown from place to place or from person to person; tools that must be raised or lowered from one elevation to another shall be placed in tool buckets or firmly attached to hand lines.
5	Tools shall never be placed unsecured on elevated places.
6	Impact tools such as chisels, punches, and drift pins that become mushroomed or cracked shall be dressed, repaired, or replaced before further use.
7	Chisels, drills, punches, ground rods, and pipes shall be held with suitable holders or tongs (not with the hands) while being struck by another employee.
8	Shims shall not be used to make a wrench fit.
9	Wrenches with sprung or damaged jaws shall not be used.
10	Pipe shall not be used to extend a wrench handle for added leverage unless the wrench was designed for such use.
11	Tools shall be used only for the purposes for which they have been approved.
12	Tools with sharp edges shall be stored and handled so that they will not cause injury or damage. They shall not be carried in pockets unless suitable protectors are in use to protect the edge.
13	Wooden handles that are loose, cracked, or splintered shall be replaced. The handle shall not be taped or lashed with wire.
14	Tools shall not be left lying around where they may cause a person to trip or stumble.
15	When working on or above open grating, a canvas or other suitable covering shall be used to cover the grating to prevent tools or parts from dropping to a lower level where others are present, or the danger area shall be barricaded or guarded.
16	The insulation on hand tools shall not be depended upon to protect users from high voltage shock (except approved live line tools).

SOP 024 Manual Handling

Ref	Description
0	Manual Handling is the term given to any and all lifting, lowering, pushing, pulling etc. which by its very nature involves a risk of injury, particularly to the back.
1	All employees will receive periodic manual handling training.
2	Employees should try and avoid manual handling where possible.
3	Where it is not possible, employees should use mechanical aids, lifting appliances etc.
4	Safety Boots should always be worn.
5	Gloves are also recommended when lifting certain objects.
6	If possible, store materials at waist height to reduce the strain on your back.
7	Have materials delivered as close to final destination as possible.
8	Assess the object you are going to be lifting.
9	Determine the weight of the object before lifting.
10	Determine best place to grip the object.
11	Ensure that your travel path is free of slipping and tripping hazards.
12	Know your own lifting restrictions and capabilities.

SOP 025 Personal Protective Equipment

Ref	Description
0	We are committed to complying with the appropriate legislation regarding the selection, supply and use of personal protective equipment
1	We recognise that the use of personal protection in the form of equipment (or clothing) should be considered as a last resort in the hierarchy of controls. The supply and use of PPE shall be based on specific risk assessment of work activities undertaken by the company.
2	It is the site and yard managers responsibility to ensure that were PPE is proposed by risk assessment the user must be supplied and be using the appropriate PPE.
3	The PPE Regulations require that all PPE is to carry a 'CE' mark to indicate it has been certified by independent inspection bodies as satisfying basic safety requirements.
4	The company, wherever necessary, will purchase and supply to employees the correct type of PPE to protect them from hazards that cannot be engineered out.
5	Assistance will be sought from employees in the choosing of PPE to ensure that it meets the requirements. Properly trained persons should examine PPE in accordance with the manufacturer's recommendations before being issued.
6	It is the duty of each employee to respect the PPE issued for their protection. The wearer should inspect it before use to ensure it is not defective and suitable for its use.
7	Personal Protective Equipment (PPE) is the general term given to clothing and equipment supplied to employees for their protection.
8	Suitable areas will be set aside on site for the storage of PPE when it is not in use.
9	Training shall be given on the wearing and use of PPE.
10	PPE given to employees must be signed off by that employee on PPE Issue Form.
11	A safety helmet must be worn at all times whilst on site, and in particular where there is a risk of materials falling from heights, in excavations, when working in confined spaces, where there is a danger of being struck by a moving object, where there is a danger of striking a fixed object, and where any construction work is in progress.
12	A high visibility vest must be worn at all times on site so as to easily identify you to plant operators etc. on site.

SOP 025 Personal Protective Equipment

Ref	Description

13 Eye protection must be worn while using abrasive wheels, e.g. cutting, grinding etc., a hammer and chisel to cut stone or brick, a cartridge tool, substance that will harm the eyes, or as required by the site.

14 Ear protection must be worn whilst operating with noisy plant or machinery and in particular when dumper trucks, using a woodworking machine, using a breaker or compressor, or other noisy machinery and working where a number of noisy machines are operating, or as required by a particular area of the site.

15 Gloves must be worn while handling chemical substances (rubber gloves), and suitable gloves must be worn whilst handling abrasives e.g. block work, steel, etc., or when pouring concrete.

16 Steel toe capped boots must be worn at all times whilst working on site and particular when, lifting or moving heavy objects: bricks, blocks, kerbs etc., in addition reinforced must be worn on site to protect against sharp objects e.g. nails, reinforcing steel, etc.

17 When working at a height where no suitable working platform has been provided, e.g. scaffolding or a secured ladder, a safety harness must be worn by personnel

18 A full body harness along with any and all lanyards, inertia reel etc. will be worn by all persons when working in areas where edge protection is not practicable

19 Other PPE may be specified and worn by employees as required.

SOP 026 Portable Electrical Tools

Ref	Description
0	Portable electrical appliances are equipment which are supplied with a connector/plug and are connected to temporary or permanent power supplies; cables and accessories are also tested.
1	It is the responsibility of the Site Management to request that his site equipment is PAT tested; it is the responsibility of the Health & Safety Coordinator to arrange for the inspection and testing of all of the company's portable electrical equipment.
2	There is a constant risk of electric shock whilst on site. Therefore, 110V systems for tools, temporary lighting and other equipment should be used when possible.
3	Routine inspection and preventative maintenance are essential. Inspection results should be recorded and "due date" labels attached to the equipment.
4	In the event of an over due test date label, the equipment must be quarantined and either a replacement sought or arrange for the equipment to be tested.
5	All tools and equipment shall be inspected by a competent person for signs of damage or deterioration and removed from service if found to be unserviceable.
6	No person should attempt to use any portable tool for which they have not received training in the safe use of that tool.
7	All tools should be inspected daily by the operator to check for obvious damage or defects.
8	Operators have a responsibility to remove from use any portable tool that develops a fault or defect.
9	Operators should ensure that electrical cables are routed so as not to cause a trip hazard, and where appropriate above head height.
10	All cables and connections shall be of an industrial standard and suitably protected from accidental damage.
11	When operating particularly noisy equipment & tools, ear protection to be used.
12	Employees must keep equipment clean and tidy.
13	Portable equipment shall not be repaired by employees unless proof of competence to do so is ascertained first.
14	Power tools shall not be operated near flammable liquids or gases.

SOP 027 Noise

Ref	Description
0	As a rule of thumb if you have to raise your voice to be heard you need to wear hearing protection.
1	Always wear hearing protection in areas where there are signs "Hearing Protection Must Be Worn".
2	Keep compressor covers closed when not in use.
3	Don't keep machinery running unnecessarily.
4	Ensure that you don't expose your fellow workers to your noise.
5	Move noise sources away from the working areas, where possible.
6	If possible shield noisy processes, work behind a wall or some other sound absorbing material.
7	Ensure that ear plugs are a good fit and correctly inserted.
8	Use disposable ear plugs only once.
9	Clean your hands before touching all types of ear plugs.
10	Ear muffs should fit the head all around the seal of the ear muffs.
11	Ear muffs should be worn the correct way around, i.e. Left side to left ear, Right side to right ear.
12	Ensure that muff seals are in good condition.
13	If you have difficulties with wearing ear protection provided report it to your supervisor.

SOP 028 - Nitrogen Testing

Ref	Description

0 Nitrogen leak Testing service is a pre-commissioning requisite to ensure that production equipment and piping systems are verified to be safe for use before the system is put on live.

All High Pressure N2 Hoses to have whip lead safety connections in place and to be inspected prior to use.

System to be tested is filled with N2 Gas from bank of N2 Bottles/Tank using pressure regulator c/w gauge (calibrated and certified)

1 Once the system to be testing set up, including meter and all connecting spools, Murjoy Ltd shall begin to leak test the assembly.

2 This shall be achieved by:

Ensuring the temporary assembly is isolated from the permanent system. Double isolation is required.

3 Pressurising the test section and connecting spool pieces to line pressure with nitrogen to verify the integrity of all pipework joints.

4 Pressurisation of the assembly should be achieved in 25% increments of final test pressure. Murjoy Ltd will provide method statement and risk assessment for leak testing to be approved by Client in advance of works.

5 During each increment, hold at each incremental pressure for a 10 minute period to perform leak checks on all flange joints and door seals to assembly

6 If at any time, an audible or visual leak is detected, stop pressurisation, identify the leak source and vent the system to atmospheric pressure.

7 Rectify any leaks as required, ensuring new gaskets are installed and that flange joint is re-torqued as required.

8 On completion of any leak repair, re-test assembly and pipework.

9 Once the leak test has proved successful, vent the system in a controlled manner allowing the assembly to depressurise to atmospheric pressure.

10 Remove all non-essential equipment from the area and ensure the site is tidy.

SOP 029 - Torqueing Operations

Ref	Description

0 PRE-JOB CHECKS

- Scope of Work has been identified
- On-site Technical Procedure has been read and understood
- Pipeline or vessel is free of pressure - if not STOP until a specific risk assessment is carried out and Safe method approved.
- Site specific Permit to Work is in place
- Generic Risk Assessment has been read and understood
- Job specific Risk Assessment has been carried out
- All members of the work party have read, understood and signed: Permit to Work & Job Specific Risk Assessment
- PPE is suitable and sufficient for the task
- Equipment is suitable for the task, tested and in serviceable condition
- Access and egress to the work site is adequate and scaffold fit for purpose, tagged and inspected within the last seven days

1 JOB SPECIFIC CHECKS

- Check that the torque values to be applied have been recommended by the manufacturer, client or Bolt load calculation software and are applicable to the tools being used and for the flange and bolt material being tightened.
- Check the flange is in good order, correctly assembled and all nuts and bolts are correctly set for protrusion, with nut stampings visible + not against the flange face.
- If any check falls out of limit, the Technical Authority is to be informed for rectification.
- If rectification is not carried out, details are to be included on the Joint Completion Certificate or recorded in JIMS/JDMS.
- Select wrench that will complete tightening operation within 75% of max output.

2 EQUIPMENT

- Hydraulic Torque Wrenches have different size square drive or direct fit hexagon cassettes that have various torque loads.
- Square drive vs. torque output data can be found in operating manuals or technical data spec sheets for individual wrenches.
- All hydraulic wrenches are normally powered from an air or electric operated hydraulic power pack with a maximum working pressure of 10,000psi / 700 Bar.

3 CALIBRATION

- The Pump must have a Calibration Certificate valid for the date of the task.
- If the Pump has no valid certificate, it should be re-calibrated or changed.
- The lubricant must be applied to the nut seating face + the portion of bolt that the nut will be turning around the end to be tightened only. Apply the lubricant to the bolt and rotate the nut up and down the bolt to spread the lubricant evenly. If possible, do this with the bolt out of the flange to ensure the lubricant is spread correctly.
- If in doubt consult the On-site Technical Procedure for the Lubrication of Nut and Bolt Assemblies.

4 LUBRICATION OF NUT/BOLT ASSEMBLIES

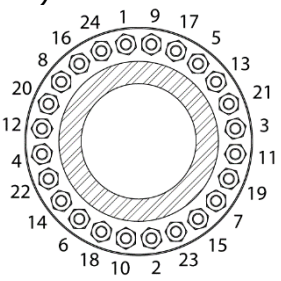
- Only approved lubricant will be used.
- Never lubricate bolts with compounds that cannot be identified or where its coefficient of friction is not known.
- All instructions for Torque Tightening should specify a Torque Value to be used with the specific lubricant. If not, consult with the Engineer responsible for the job .
- If the nut/bolt assemblies have been lubricated, check if it has been completed correctly and that (1) and (2) above are known.

SOP 029 - Torqueing Operations

Ref	Description

5 RECOMMENDED FLANGE BOLT TIGHTENING PROCEDURE

- Measure the flange gap at a minimum of four points around the flange (larger flanges should be at eight points)
- The bolt tightening sequence should begin at the point of the largest gap!
- Mark the correct tightening sequence on the studs in a clockwise direction with chalk as per diagram. For the correct sequence see (ASME-PPC-1-2000).
  Criss-Cross Tightening Sequence Examples:
  Note: Correct numbering of bolts should result in all odd numbered bolts around one side of the flange and all even numbered bolts around the other side.
  Marked Up 8 Bolt Flange 1st, 2nd, & 3rd Stage 4th & Final Stage
  Criss Cross Sequence Adjacent Bolt Sequence



- Determine the Torque Value for the flange and bolt material being tightened as recommended by the manufacturer, client or Hydratight bolt load calculation software and that it is achievable with the tools being used. Check that the Flange size, class, rating and bolt material match those on the data sheet.
  Visually check that the flange has been correctly assembled and the correct gasket is fitted.
  Check Nut Stampings are the correct way around.
- First tightening stage should be limited to a maximum of 30% of the final Torque setting.
- Second tightening stage should be limited to a maximum of 60% of the final Torque setting.
- Third tightening stage should be carried out at the 100% Torque setting.
- On the Fourth and Final tightening stage, change from diagonal tightening to adjacent bolt-to-bolt tightening clockwise using the 100% Torque setting and chase around flange until nuts finally stop rotating.
  Note: First, second and third stages should be tightened using the criss cross tightening sequence and the fourth stage should be tightened using the adjacent clockwise bolt to bolt sequence as shown in the diagrams above
- Using a small hammer tap test each bolt to check the sound of the bolt rings true, dull or vibrating bolts should be retightened to the correct value.
- Flanges will be identified and numbered on an As-Built Drawing for recording purposes
- Each Flange Number with be recorded in a Torque Flange Register
- Complete a Flange Tag and attach to the joint
- If a flange joint is broken, tag will be removed and recorded in the Torque Flange Register
- Record all tightening information on a Joint Completion Certificate as work progresses.
- Ensure that the work area is left in a safe and tidy condition and that any Permit to Work has been signed off.

SOP 029 - Torqueing Operations

Ref	Description

6 TOOL FITTING & OPERATION

Using hydraulic torque wrenches:

Note: Operation by one person is always recommended unless the wrench cannot be handled safely. When two personnel are required then communication both verbal and visual must be maintained at all times between the tool handler and remote control/pump operator. The tool must not be energised without notification from the tool handler.

- Ensure that the Power Console is full of Hydraulic Oil and if an Air Power Console is being used, that the Air Lubricator has sufficient oil in it.
- Make sure that all Air and Hydraulic Couplings are clean and free from dirt.
- Square Drive Tools Only: Check that the correct size Impact Socket has been selected and that it has a Retaining Ring and Pin.
- Check that the Square Drive is in the correct position for tightening operations.
- Attach the Impact Socket and secure it with the Retaining 'O' Ring and Pin.
- Position the Reaction Arm for the best angle and safe operation then engage the retaining device.
- Hex Head Tools Only: Check that the correct size Hex Head has been selected for the relevant power head and that it is fitted correctly.
- With the tool removed from the flange and safely positioned on the ground, connect the hydraulic hoses to the tool and the power console via the quick release fittings ensuring that all locking collars/thumbscrews are fully tightened.
- Connect the pump to an air supply with whip checks and pins at all connections. Switch on air supply and check system for leaks

7 Flange Specific Data

JOB DATA SHEET FOR USE WITH HAND OR HYDRAULIC TORQUE WRENCH

1. Unit .
2. Flange
3. Bolt Diameter .
4. Bolt Material .
5. Number of Bolts .
6. Nut Size ATF .
7. Gasket Type .
8. New Bolts .
9. New Washers.
10. Lubricant Manufacturer .
11. Lubricant Name or Number
12. Torque Wrench Data:
    Manufacturer
13. Torque Settings:
    First Pass at 30% _____ Ft Lbs
    Second Pass at 60% _____ Ft-Lbs.
    Third Pass at 100% _____ Ft-Lbs.
    Fourth Pass at 100% _____ Ft-Lbs.
14. Friction Factor
15. Residual Stress of ____ lb/in^2

SOP 029 - Torqueing Operations

Ref	Description

8 Hazard Controls

- Tools to be checked for leaks & wear,
- Wear suitable eye protection,
- Use gloves when holding pressurised equipment,
- Operatives to be trained in correct use of tools and only authorised personnel allowed use them.,
- Implement signal system when 2 person operation – pendant/tool – eg.' Shout 'fingers' prior to advancing tool.
- Replace suspect tools.
- Clean down, inspect and store tools at end of shift to maintain their integrity..
- Torque tools and pressure gauges to be calibrated and certified fit for use.
- Never work alone with these tools.
- Be aware tools retain high internal loads during torqueing and can 'jump off'. Stand back as far as practical and keep face away from working tool.
- All tensioners & hoses to have test certificate,
- All gauges to be calibrated to indicate accurate load
- Operatives should have a recognised certificate in bolt tensioning – eg PF015,
- Implement signal system when 2 person operation – pendant/tool – eg.' Shout 'fingers' /'clear' prior to advancing tool.
- Never work alone with these tools.
- Be aware tools retain high internal loads during tensioning and can 'jump off'. Stand back as far as practical and keep face away from working tool.
- Never stand inline of tensioner jack – stand to the side.
- For electric tensioner pumps, refer to RA00X – 'Working with Electrical Equipment'
- Assign responsibility to team members for prevention of slips, trips – eg good housekeeping through the delivery period.
- Maintain access routes free from obstructions,
- Extensions leads, hoses kept to minimum,
- Clean all spillages immediately,
- Fit whip lanyards to all compressor hose joints,
- Only competent personnel to fit/join hoses and operate compressors.
- Regular checks to be carried out on hoses and fittings prior to and during use.
- Equipment to be certified as fit for use.
- Wear goggles when using pneumatic tools and ensure working pressures are not exceeded.
- Identify and treat any machine/tool causing numbness and/or tingling after 5-10min working.
- Provide tools with lower vibration levels eg nut runners instead of impact drivers.
- Rotate roles within the crew to reduce exposure levels to individual members.
- Refer to data sheet from tool supplier detailing vibration levels and exposure time.

SOP 030 – Traffic Management

Ref	Description

0 Purpose of Site Traffic Management Plan is to:

- Organise construction site so that vehicles/plant and pedestrians using site routes can move around safely – keep pedestrians and vehicles apart
- Ensure safe access/egress to and from the site
- Identify any access road restrictions, narrow roads, restricted bridges, bad bends, etc
- Ensure the routes are suitable for the persons or vehicles/plant using them, in suitable positions and sufficient in number and size.
- Vehicle incidents can and should be prevented by the effective management of transport operations throughout the construction process.
- Minimise vehicle movement
- Limit People on site
- Limit Turning of Vehicles on site
- Ensure Visibility of pedestrians to vehicle/plant operators
- Signage & Instruction
- Additional TMP may be required for transport of equipment and plant to site, temporary road works, etc

1 Keeping pedestrians and vehicles apart

The majority of construction transport accidents result from the inadequate separation of pedestrians and vehicles.

This can usually be avoided by careful planning, particularly at the design stage, and by controlling vehicle operations during construction work.

The following actions will help keep pedestrians and vehicles apart:

Entrances and exits -	provide separate entry and exit gateways for pedestrians and vehicles;
Walkways -	provide firm, level, well-drained pedestrian walkways that take a direct route where possible;
Crossings -	where walkways cross roadways, provide a clearly signed and lit crossing point where drivers and pedestrians can see each other clearly;
Visibility -	make sure drivers driving out onto public roads can see both ways along the footway before they move on to it;
Obstructions –	do not block walkways so that pedestrians have to step onto the vehicle route; and
Barriers -	think about installing a barrier between the roadway and walkway.

SOP 030 – Traffic Management

Ref	Description

2 Minimising vehicle movements

Good planning can help to minimise vehicle movement around a site. For example, landscaping to reduce the quantities of fill or spoil movement.

To limit the number of vehicles on site:

- provide car and van parking for the workforce and visitors away from the work area;
- control entry to the work area; and
- plan storage areas so that delivery vehicles do not have to cross the site.

3 People on site

Employers should take steps to make sure that all workers are fit and competent to operate the vehicles, machines and attachments they use on site by, for example:

- checks when recruiting drivers/operators or hiring contractors;
- training drivers and operators;
- managing the activities of visiting drivers.

People who direct vehicle movements (signallers) must be trained + authorised to do so.

Accidents can also occur when untrained or inexperienced workers drive construction vehicles without authority. Access to vehicles should be managed and people alerted to the risk.

4 Turning vehicles

The need for vehicles to reverse should be avoided where possible as reversing is a major cause of fatal accidents.

One-way systems can reduce the risk, especially in storage areas.

A turning circle could be installed so that vehicles can turn without reversing.

5 Visibility

If vehicles reverse in areas where pedestrians cannot be excluded the risk is elevated and visibility becomes a vital consideration.

You should consider:

Aids for drivers -	mirrors, CCTV cameras or reversing alarms that can help drivers can see movement all round the vehicle;
Signallers -	who can be appointed to control manoeuvres and who are trained in the task;
Lighting -	so that drivers and pedestrians on shared routes can see each other easily. Lighting may be needed after sunset or in bad weather;
Clothing -	Pedestrians on site should wear high-visibility clothing.

SOP 030 – Traffic Management

Ref	Description

6 Signs and instructions

Make sure that all drivers and pedestrians know and understand the routes and traffic rules on site.

Use standard road signs where appropriate

Provide induction training for drivers, workers and visitors and send instructions out to visitors before their visit.

7 Construction Work on Public Roadway

If Murjoy Ltd are undertaking any construction work on the public roadway and where the available road width is restricted by our construction work which involves the opening, excavating or breaking up of the road, or the road is obstructed by plant/equipment or by materials during the course of the work a traffic management plan will be put in place.

We engage the services of Health and Safety Services Training and Consultancy to develop a traffic management plan.

We have a person trained in Signing Lighting and Guarding of Roads employed in the company.

For larger contracts we would engage the services of a competent traffic management company.

All signs and cones will be used and placed as per Department of Transport Safety Signs Manual Chapter 8 / and New Guidance Document Second Edition 2010.

Signs will be put in place to advise all who use the roadway of ongoing works.

A Safe System of Work Plan (SSWP) will be completed before work begins

SOP 030 – Traffic Management

Ref	Description

8 Transport of Heavy /Large Items of Plant & Equipment

Where a project involves the transportation of heavy/large items of plant and equipment, a specific traffic management plan will be put in place.

We engage the services of Health and Safety Services Training and Consultancy to develop traffic management plans.

We have a person trained in Signing Lighting and Guarding of Roads employed in the company.

The route will be assessed. Any potential hazardous locations, narrow passing points and blind spots will be identified along the route and logged.

The agreed route will be discussed will all involved including locations where convey will pull in for load inspecting. (MS / Tool Box Talk)

All persons involved in the operation should be fully aware of the activities involved.

No person should be permitted carry out a task or role unless they are trained and competent to carry out the task safely.

All personnel will be inducted on the safe transportation from loading area to unloading site.

All transportation trailers and tractors units are certified and DOE prior to usage operators carry out a detailed pre-inspection to ensure the vehicles is in good working order. Any faults found are noted, then reported to haulier and rectified. All lifting gear is checked and certified

The supervisor will review the weather conditions and weather reports for the local area prior to commencement of transportations operations. If it deemed unsafe or unsuitable all operations will cease until weather conditions improve.

The Road traffic act to be adhered to at all times speed limits, parking areas and road signage will be followed at all times.

The safety of members of the public is priority during operations.

Operators to drive at a safe speed and mobile phone used is not permitted unless in hand free kit.

Drivers to stop at nominated locations to inspect vehicle and load.

Nominated locations to be safe and vehicle or load should not be a hazard to any members of the public.

SOP 031 - Mobile elevating work platforms (MEWPs)

Ref	Description

0 The most significant MEWP dangers arise from operation and use of the machine rather than from their movement as a site vehicle. The law says that these hazards must be properly controlled.

However, a safe workplace for all vehicle operations needs be established by separating pedestrians and vehicles and providing hazard-free traffic routes.

Operators have died when trapped in the MEWP basket or when the machine has overturned. Great care must be taken to select the most appropriate MEWP and ensure that use of the machine is properly planned and managed. Operator instruction and training are very important requirements.

1 MEWP hazards

Most fatal and serious injuries involving MEWPs arise from:

- Entrapment: operator trapped between part of the basket and a fixed structure, eg when manoeuvring in confined overhead areas of steelwork. Operators may become trapped against the platform controls, and if this happens they may not be able to stop the machine running.
- Overturning: the machine may overturn throwing the operator from the basket;
- Falling: an operator may fall from the basket during work activities; and
- Collision: the vehicle may collide with pedestrians, overhead cables or nearby vehicles.

These hazards should be identified within a risk assessment and suitable control measures put in place.

SOP 031 - Mobile elevating work platforms (MEWPs)

Ref	Description

2 Controlling the risk

It is important to select the right MEWP for the job and site.

Have a plan for rescuing someone from a MEWP and practise it – someone on the ground should know what to do in an emergency and how to operate the machine's ground controls.

There are a number of precautions that can reduce the risk from MEWP hazards. These are:

- Confined overhead working: Brief operators on the dangers, and the safe system of work to be followed. If there are overhead structures against which an operator could be trapped and then pushed onto the MEWP controls, consider selecting a MEWP that has been designed to prevent such accidental contact.

  MEWPs with shrouded or otherwise protected controls are available.

  Keeping the platform tidy will reduce the risk of the operator tripping or losing balance while in the basket.
- Ground conditions: The platform should be used on firm and level ground. Any temporary covers should be strong enough to withstand the applied pressure. Localised ground features, eg trenches, manholes and uncompacted backfill, can all lead to overturning.
- Outriggers: Outriggers must be extended and chocked before raising the platform. Spreader plates may be necessary – check the equipment manual.
- Guardrails: Make sure the work platform is fitted with effective guard rails and toe boards.
- Arresting falls: if there is still a risk of people falling from the platform a harness with a short work restraint lanyard must be secured to a suitable manufacturer provided anchorage point within the basket to stop the wearer from getting into a position where they could fall from the carrier.
- Falling objects: barrier off the area around the platform so that falling tools or objects do not strike people below.
- Weather: high winds can tilt platforms and make them unstable. Set a maximum safe wind speed for operation. Storms and snowfalls can also damage platforms. Inspect the platform before use after severe weather.
- Handling materials: if used to install materials check the weight and dimensions of materials and consider any manual handling and load distribution issues. You may need additional lifting equipment to transport materials to the work position.
- Nearby hazards: do not operate a MEWP close to overhead cables or other dangerous machinery, or allow any part of the arm to protrude into a traffic route.
- Manufacturer Instructions – To be adhered to at all times

SOP 031 - Mobile elevating work platforms (MEWPs)

Ref	Description

3 Training and competence

MEWP operators should have attended a recognised operator training course and received a certificate, card or 'licence', listing the categories of MEWP the bearer is trained to operate.

The expiry date of the training licence or card should be checked.

In addition to formal training for the type of MEWP, operators should have familiarisation training on the controls and operation of the specific make and model of MEWP they are using.

4 Inspection, maintenance and examination

A programme of daily visual checks, regular inspections and servicing schedules should be established in accordance with the manufacturer's instructions and the risks associated with each MEWP.

Operators should be encouraged to report defects or problems. Reported problems should be put right quickly and the MEWP taken out of service if the item is safety critical.

The MEWP must be thoroughly examined at least every six months by a competent person or in accordance with an examination scheme drawn up by such a competent person.

5 Rescue Procedure – Fall Arrest

Time is of the essence - Need to be rescued in a short a time as possible.

- Raise Alarm
- Phone 999/112 imediately
- Notify Nearby Personnel
- Alert Security/ERT -
- Alert Supervisor
- ASSESS/Cordon off the area
- Whatever means available is to be used as a rescue platform, ie MEWP, Machine, etc, which is to be pushed under the person to take their weight to prevent victim's circulation from being cut off, until they can be cut down
- A maximum of 2 persons should be employed to cut the person down from the harness. Ensure the rescue persons are not in danger of falling while under taking this operation.
- One person should take the weight of the victim while the other cuts the lanyard.
- A member of the emergency team will escort the emergency services to and from the site and the emergency co-ordinator will appoint a person to accompany the casualty to hospital.

SOP 032 - Telescopic Handlers

Ref	Description
0	In accordance with the regulations, Telescopic handlers used must be carefully selected, maintained and operated by trained drivers. Key issues are: • Telehandler hazards • Controlling the risk • Training and competence • Inspection and maintenance

1. Telescopic Handlers hazards

Most fatal and serious injuries involving telehandlers occur when the vehicle is:

- Moving – and strikes a pedestrian, particularly while reversing;
- Lifting – and overturns trapping the operator or person nearby.

Both of these hazards should be identified within a risk assessment and suitable control measures put in place.

2 Controlling the risk

It is important to select the right vehicle for the job and site. There are a number of precautions that can reduce the risk of persons being struck or the vehicle overturning.

- Visibility: Select telehandlers with the best view around them directly from the driver position.
- Rear visibility: Visibility to the rear may present a significant hazard. The vehicle should be equipped with adequate aids so drivers can see areas where people may be at risk. A signaller may be needed in some circumstances.
- Forward visibility: Similarly, when in operation with the boom raised and other configurations, there may be a significant 'blind spot' to the front right-hand side of the vehicle.
- Ground conditions: Working on sloping, uneven or unstable ground can be hazardous. Telehandlers normally require prepared, flat, graded surfaces to operate safely. Even rough-terrain lift trucks have strict operational limits that need to be observed.
- Loading: Overloading can be prevented by selection of the correct vehicle and good management. Moving with a raised load is dangerous and should be avoided at all times.
- Speed: a site speed limit should be established. Driving at excessive speed around corners can cause the vehicle to overturn.
- Manufacturer Instructions – To be adhered to at all times

3 Training and competence

Drivers must be trained and competent regarding the telehandler hazards + precautions:

- Drivers should be trained, competent and authorised to operate the specific telehandler used. Training certificates from recognised schemes help demonstrate competence and certificates should be checked for validity; and
- Pedestrians should be instructed in safe pedestrian routes on site and the procedure for making drivers aware of their presence.

4. Inspection and maintenance

A programme of daily visual checks, regular inspections and servicing schedules should be established in accordance with the manufacturer's instructions and the risks associated with each vehicle.

Drivers should be encouraged to report defects or problems. Reported problems should be put right quickly and the excavator taken out of service if the item is safety critical

SOP 033 - Handling, Use & Storage of Gas Bottles

Ref Description

Gas cylinders are heavy and are filled with gas held under high pressure. Standard size dispense gas cylinders weigh about 16kg when empty and around 20kg when filled (depending on the gas or gas mixture), and larger cylinders can be nearly five times heavier.

Perhaps even more importantly, they are filled with gas held at high pressure and, if a cylinder discharges or ruptures there are likely to be serious consequences.

Gas cylinders must be handled, used and stored carefully in accordance with the Safety, Health & Welfare at Work (General Applications) Regulations 2007 2016, Chapter 4 of Part 2 and other health and safety guidelines.

Safe handling of gas cylinders
Incorrect handling of heavy, awkward cylinders can cause personal injury; particularly to the back,

ALWAYS	Follow Manual Handling Procedures
ALWAYS	use protective gloves and footwear when handling cylinders
ALWAYS	use suitable equipment such a trolley or mechanical lift for moving large cylinders
NEVER	drop, throw or mishandle cylinders
NEVER	lift a large cylinder; this can cause muscle strain or back injury
NEVER	lift cylinders above chest height

Safe Storage of gas cylinders

ALWAYS	Store and Secure gas bottles in an upright position
ALWAYS	keep cylinder stocks to the necessary minimum for your volume of trade
ALWAYS	return all empties to the gas supplier
ALWAYS	store full cylinders in an area away from cylinders in use
NEVER	store cylinders where they may come into contact with water
NEVER	store next to a direct heat source; e.g. radiators, coolers, ice machines etc.
NEVER	stack objects in front of cylinders.
NEVER	carry gas cylinders in a car or other closed vehicle
NEVER	store/stand cylinders on uneven floors.

Safe Use of gas cylinders

ALWAYS	secure the cylinder in an upright position with chain or in a bottle trolley
ALWAYS	Check gas bottle and connections are in good condition before use
ALWAYS	only use cylinders filled by a reputable gas supplier
ALWAYS	connect to a primary regulator valve, either directly or through a high pressure hose
ALWAYS	keep away from sources of heat
ALWAYS	check the cylinder label before using it. Ensure that the correct gas mixture is connected to the line
NEVER	fill one gas cylinder from another - this is extremely dangerous
NEVER	connect gas cylinders to any equipment other than the primary regulator
NEVER	use cylinders for anything other than storing and delivering gas
NEVER	oil or lubricate cylinder valves
NEVER	touch a frosted cylinder. Frosting usually indicates a rapid release of gas
NEVER	try to unscrew the valve fittings on the cylinder

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SOP W-001 - LATHE

Ref	Description
0	All metal must be properly secured in the lathe chuck or mounted prior to the machining process taking place. Use the correct sized clamp or vice for the metal being machined
1	Turn the chuck or faceplate by hand to ensure there is no binding or danger of the work striking any part of the lathe
2	Check to ensure the cutting tool will not run into the chuck
3	Before starting the lathe, ensure the spindle work has the cup center imbedded; tail, stock and tool rests are securely clamped; and there is proper clearance for the rotating metal
4	Prior to starting the lathe, ensure that small diameter stock does not project too far from the chuck without support from the tail stock center
5	When starting, do not force the tool in the work piece or take too big a cut
6	The operator must always be aware of the direction and speed of the carriage or cross-feed prior to engaging the automatic feed
7	Never leave the key in the chuck. Do not let go of the key until it is free of the chuck and secured in its proper holding place
8	Select turning speed carefully. Large diameter material must be turned at a very low speed. Always use the lowest speed to rough out the stock prior to final machining
9	Select turning speed carefully. Large diameter material must be turned at a very low speed. Always use the lowest speed to rough out the stock prior to final machining
10	The correct speed and feed for the specific material and cutting tool must be used. Stop the machine before making adjustments or measurements
11	Do not remove metal from the table or stock by hand. Use a brush or other tool to properly remove chips from the table or stock
12	Never attempt to run the chuck on or off the spindle head by engaging the power
13	Do not stop the rotation of the chuck by reversing the power to the lathe unless tapping holes
14	Do not leave tools, bits or excess pieces of material on the lathe bed
15	All belts and pulleys must be guarded. If frayed belts or pulleys are observed, the lathe must be taken out of service and the belts or pulleys replaced
16	Stop the machine immediately if odd noise or excessive vibration occurs
17	Only properly sharpened drill bits and cutting tools in good condition should be used. Dull drill bits and chipped or broken cutting tools must be removed from service
18	Disconnect the lathe from power source if making repairs or servicing
19	When an operator has finished working on the lathe, and before leaving the lathe for any reason, the power must be shut off and the machine must come to a complete stop.
20	When an operator has finished working on the lathe, and before leaving the lathe for any reason, the power must be shut off and the machine must come to a complete stop
21	When an operator observes an unsafe condition with the lathe or material being worked, the operator must report it immediately to the foreman and the lathe shall be taken out of service until the problem has been corrected

SOP W-002 - BENCH AND ANGLE GRINDERS

Ref	Description
0	Only properly trained and authorized employees are permitted to change discs
1	Read and follow manufacturers' recommendations
2	Always wear protective eye glasses or face shield
3	Keep working area clean.
4	Never use angle grinders around flammable liquids or gases
5	Do not wear loose clothing or jewellery with grinders
6	Always secure work piece
7	Do not over reach, keep footing and balance at all times
8	Always unplug tool before servicing or when not in use
9	Inspect before use: for damaged parts, cut-off discs, and cords for cracks or damage, all guards and shields in place
10	Always cut so sparks do not contact you or someone else
11	Always work with proper lighting

SOP W-003 - Welding

Ref	Description

0 Protective Clothing

Personal protective equipment is mandatory for all employees while welding. This applies to the welder and any helpers. During arc welding, a welding helmet and the proper dark lens shade must be worn

1 Electrical Hazards

- The welding machine must be securely grounded.
- The electrode holder shall be specifically designed for its use, and have capacity capable of carrying the maximum-rated current required by the electrodes in use. The work leads must be of sufficient size also.
- The work leads will be checked for damaged insulation and secure attachment to the welding machine.
- The ground lead must be securely attached and close to the work to prevent unwanted arcing.
- Electrode holders left unattended shall not have a rod in them. Rod scraps shall be disposed of properly.
- The power supply to a welding machine shall be turned off if it is not used for any "appreciable length of time", or when it is to be moved.

2 Ultraviolet Radiation

The arc welding process produces harmful ultraviolet rays. If unprotected, it will burn exposed skin and cause "flash burn" to the eyes. As mentioned earlier, personal protective equipment is required for the welder and helper. When possible, a welding curtain shall be used to protect other workers from the ultraviolet rays. Remember, they do not have to directly view the arc to be hurt by it.

3 Fire and Explosions

Arc and welding produces intense heat. Temperatures up to 12,000 °F are possible and special precautions need to be taken to prevent deadly fires and explosions.

- Never weld near stored ignitable materials or combustible debris. Never weld on a drum or barrel unless it has been thoroughly cleaned of any previously contained material, or is filled with water.
- Never weld on a compressed gas cylinder.
- Always have adequate fire extinguishing equipment immediately available where you are welding.
- If necessary, have additional personnel stand fire watch while work is being performed.

4 Toxic Gases and Fumes

The welding process produces various exhaust gases and fumes, depending on the materials you are working with. Simple precautions must be taken to avoid inhalation of toxic gases and fumes.

- Keep your head out of the fume path. Your welding helmet will also help protect your breathing zone.
- Provide ventilation, especially in welding booths, away from the welder.
- Some materials are known to be toxic or carcinogens. Respirators are required when working with them. They include; galvanized metals, lead,

SOP W-004 - Cutting Torch

Ref	Description

0 Before igniting the flame of a torch:

* Open the oxygen valve on the torch.
* Wait until all air has been discharged from the oxygen hose and torch.
* Close the valve.
* Open the fuel gas valve on the torch handle.
* Wait until all air has been discharged from the fuel gas hose and torch
* Then light the fuel gas and open the oxygen valve on the torch handle. Adjust the oxygen to produce the required flame for the job.

1 Light torches with friction lighters or other suitable lighters and not matches. Point the tip away from people.

2 Never put down a torch until the gases have been completely shut off

3 Never open or turn the pressure adjusting screws on the regulators all the way out. Always adjust flames at torch valves, not with regulator adjusting screws.

4 ALWAYS use fuel gases at safe pressures. Many gauges permit higher, unsafe pressures. If you find a gauge that permits unsafe pressures, take it out of service immediately.

5 Oxygen and fuel gas hoses must be different in colour (green for oxygen and red for fuel gas) or otherwise identified.

6 Inspect hoses and connections every day for leaks. Look for holes, cracks, and loose cylinder fittings. To check for leaks: close the oxygen and fuel gas torch valves, then turn the regulator pressure adjusting screws clockwise to give normal working pressure on oxygen valves and about 10 PSIG on fuel gas valves. Use non-fat soapy water or approved leak test solution to test for leaks. At the same time, check regulators for creeping.

7 If a torch backfires frequently, inspect it and clean the tip. If it continues to backfire or you find other problems, remove it from service immediately. Report it to John Murphy.

8 Do not use steel wire or similar materials to clean tip orifices

9 "Flashback" occurs when a flame burns back inside a torch, tip, hose, or regulator and can cause a fire or explosion if it reaches the cylinder. Flashbacks usually make high-pitched squealing or hissing sounds. Flashback arrestors at torch handles and check valves at gas sources help prevent flashbacks. In case of flashback:

* Close the oxygen valve at once.
* Close the fuel valve.
* Let the torch cool off.
* Have the torch repaired or replaced.

SOP W-005 - Oxy-Acetylene Cutting

Ref	Description

0 The rules about personal protective equipment and fires and explosions that govern welding also apply to oxy-acetylene cutting.

Eye protection is mandatory for all employees using the torch.

Do not use the torch in explosive atmospheres or around combustible materials.

Do not cut into an empty drum that previously contained flammable gases or liquid unless it has been cleaned.

Other rules relating to the use of high-pressure gas bottles include

1 Before starting a torch project, the employee shall inspect the equipment. The hoses, valves, couplings, and connections shall be checked for damage and leaks

2 During transportation, storage, or when in use, a compressed gas cylinder must always be secured in an upright position. This is especially important for acetylene bottles, because the acetone in them can corrode the valve assembly if laid on its side.

3 Full or empty gas cylinders not in use shall have their valves shut and the valve protection cap screwed on.

4 Oxygen cylinders must have their valve opened all the way for use. Acetylene valves, however, must be opened not more than 1½ turns so they can be quickly turned off in an emergency. Valves that utilize a T wrench must have the T wrench in place when in use.

5 Torches will be lit by strikers or friction lighters, not with matches, cigarettes, or from hot work.

6 10 BASIC RULES FOR OXY-ACETYLENE WELDING

1. Blow out cylinder valve before you connect the regulator.
2. Release the adjusting screw on the regulator before opening the cylinder valve.
3. Stand to one side of regulator before you open the cylinder valve.
4. Open cylinder valve slowly.
5. Do not use or compress acetylene in a free state at pressures more than 15 psig.
6. Purge your acetylene and oxygen passages individually before lighting the torch.
7. Light the acetylene before opening the oxygen on the torch.
8. Never use oil or grease on regulators, tips, etc., in contact with oxygen.
9. Do not use oxygen as a substitute for air.
10. Keep your work area clear of anything that will burn.

SOP W-006 - Band Saw

Ref	Description
0	It is the duty of each operator to immediately eliminate or report any changes occurring on the machine or in the material being cut which changes may effect the machine's safe operation.
1	The cleanliness and tidiness of the machine and its surrounding area must be maintained by the operator
2	Wear appropriate personal protective equipment to include eye protection.
3	Work on or alteration of the machine which detrimentally affects the safety of the machine in any way is prohibited.
4	Keep guards in place and in working condition.
5	Keep work area clean. Cluttered areas and benches invite accidents.
6	Keep all observers at a safe distance from the work area.
7	Disconnect the power to the band saw before servicing, making adjustments, and when changing blades.

SOP W-007 - Fork Lift

Ref	Description
1	Only trained and authorised operators shall be permitted to operate a forklift.
1	Perform a walk-around inspection of the forklift before each use. Make sure that all safety devices are in place and functioning properly.
2	USE YOUR SEATBELT!
3	Forklifts shall not be driven up to anyone standing in front of a bench or other fixed object.
4	No person shall be allowed to stand or pass under the elevated portion of any forklift, whether loaded or empty.
5	Passengers are not allowed to ride on a forklift.
6	Arms or legs are prohibited from being placed between the uprights of the mast or outside the running lines of the forklift.
7	When a forklift is parked, the forks shall be fully lowered, engine switched off and handbrake engaged
8	The driver shall be required to slow down and sound the horn where vision is obstructed. If the load being carried obstructs forward view, the driver shall be required to travel with the load trailing.
9	The driver shall be required to look in the direction of, and keep a clear view of the path of travel.
10	Under all travel conditions the forklift must be operated at speed that will permit it to be brought to a stop in a safe manner.
11	Slow down for wet and slippery floors.
12	Avoid running over loose objects on the roadway surface.

SOP W-008 - Slings & Rigging

Ref	Description
0	The entire length of the sling must be visually inspected prior to use, at regular intervals, and after any incident. Clean the sling before inspecting it. Dirt and grime can hide damage, especially on chain and wire rope. Slings will be relaxed when you inspect them. Damaged or defective slings must be discarded. When disposing of a defective or damaged sling, cut the sling in half or otherwise destroy it so there is no danger of it being reused
1	When inspecting steel alloy chain slings, pay special attention to nicks, gouges, cracks, corrosion pits, stretching, and distorted or worn fittings.
2	Wire rope slings must be replaced if there is severe corrosion, localized wear (shiny worn spots), a 1/3 reduction in outer wire diameter, excessive stretching, damage or displacement of end fittings, more than 10 broken wires in one lay, or evidence of damage to the rope structure such as kinking, crushing, or other distortion.
3	Do not use synthetic web slings that have burns, broken or worn stitches, excessive stretch, exposed warning stitches (usually red yarn), snags, punctures, tears or cuts, or distorted fittings.
4	Inspect for broken wires in metal mesh slings, lack of sling flexibility, kinks or twists in the edge
5	Store slings vertically on a rack of wall to minimize the risk of damage and for easy access
6	Lift only from solid attachment points
7	Before making the lift, make sure the weight and balance of the load are known and the sling is securely positioned around the load
8	Guard against shock loading by taking up slack in the sling slowly
9	Operators must know + must not exceed the working load limit (rated capacity) of the sling
10	Do not lift items that exceed the working load limits of the sling
11	Safe Practices for Using Chains • Take up slack slowly and see that every link in the chain seats properly. Never put strain on a kinked chain. If the links do not slide freely within each other, the chain is damaged and must be removed from service. • Do not use a hammer to force a hook over a chain link. • See that the load is always properly set in the bowl of the hook. • Never attempt to repair the welded components on a sling. A broken chain must not be spliced with a bolt or any other type of coupling.
12	Safe Practices for Using Wire Rope Slings • Lubricate the chain for longer service life. Before applying lubricant, make sure the sling is as dry and clean as possible. Lubricating a dirty or damp sling promotes corrosion. • Avoid bending wire rope around small radius bends.
13	Safe Practices for Synthetic Web Slings. • Synthetic web slings cannot be repaired; damaged slings must be discarded. • Do not join slings by knotting. Stretching is the only accepted method of attaching end fitting or forming eyes

SOP W-009 - Gantry Crane

Ref	Description
1	Ensure Gantry Cranes are tested and inspected as per regulations, Inspected every 12 months.
2	Ensure SWL signs are in place, so they may be seen and read.
3	Visually Inspect before use - Check for Any oil leaks / vibration Sounds - Check that the hoist is in proper working conditions - Check that the Hook Block is in good condition - Ensure all Limit Switches are in good working condition - Ensure all wire ropes/chains are in good condition
4	All operators to be trained in the safe use of the Gantry Crane and Controls
5	Ensure load is rigged by correctly by competent person
6	Always consult the load chart before you attempt a lift.
7	Do not overload / exceed the capacities on the chart.
8	Slings and chains shall be adequate to hold the weight of products being lifted.
9	Do not lift a load from the side – Centre crane over load.
10	Employees will not ride the loads.
11	Do not lift load over people, Do no stand under load
12	Ensure load is properly secured before lifting.
13	Do not multitask when operating crane
14	Do not rush the task – Take your time and care when operating crane
15	Use Tag Lines to control movement of load
16	Ensure adequate clearances for moving load
17	Ensure Crane is maintained in good working condition

Refer to Guide to Safe Use of Gantry Cranes