PLANT SAFETY - GENERAL

1. Purpose:

To minimize the risks associated with the deployment, management and operation of plant on Bardavcol sites.

2. Objective:

To comply with regulatory standards and contractual requirements.

3. Target:

- Environment in which plant operates is suitable and free of obstructions
- Operator(s) trained and use plant safely
- Plant not damaged, and fully operational
- No incidents, accidents or injuries associated with operation and control of plant & equipment.
- No damage to plant, equipment, buildings or infrastructure from operation and control of plant and equipment.

4. Controls:

4.1 Operation of Plant

a) Before attempting to drive or operate any company vehicle, employees and subcontractors must ensure that there are no obstructions before moving off and satisfy themselves that the vehicle is in a safe and roadworthy condition. Any faults or potential hazards must be reported to the Project Manager immediately.

b) All site personnel are to maintain a safe working distance from all earthmoving plant at all times.

c) Employees must:

- not drive any company vehicle, crane, forklift or any other appliance for which they do not hold the driving license or hold a valid certificate of competency.
- not drive or operate plant, vehicles or equipment recklessly, or in a manner likely to cause danger to their fellow employees, other people or themselves. Employees must observe speed restrictions, traffic controls, road signs, parking restrictions and any other relevant regulations.
- keep their vehicles in a clean and tidy condition ensuring that controls and safety devices are not obstructed or in any way rendered ineffective.
- not carry unauthorized passengers or unauthorized loads.
- not carry passengers unless there are seats and seat belts.
- not use mobile phones while operating plant unless required by supervision.
- not use headphones while operating plant.
- not operate any vehicle, plant or equipment whilst intoxicated or under the influence of any drug. Any driver found in an intoxicated condition or under the influence of a drug may be suspended immediately. Refer CP06 Alcohol & Drugs Policy; WI 32 – Alcohol & Drugs
- if employees leave their machine, any raised equipment (buckets, blades, etc.) must be lowered to the ground.
- not use any machinery, plant or equipment for which guards have been provided without those guards being in the authorized position and in full working order. Any faults or damage to guards must be reported to the Project Manager immediately.
- not clean any machinery, plant or equipment whilst it is in motion.

- not leave any vehicle, plant or equipment running whilst unattended unless specifically required to do so.
- Employees under 18 years of age must not operate any dangerous machinery, plant or equipment unless they have been trained or are being retained under a course of supervision.
- not use any damaged or faulty tools, machinery, plant or equipment. Any damage or faults must be reported to the Site Supervisor / Project Manager immediately. Employees must not make temporary or running repairs unless approved by the Operations Supervisor.
- not make any electrical repairs or maintenance to any machinery, plant or equipment unless qualified and authorized to do so. Any electrical faults must be reported to the Operations Supervisor immediately.
- not attempt any repairs to any machinery, plant or equipment, unless qualified and authorized to do so.
- use machinery only for the purpose for which it was designed and must not attempt any alteration to machinery that is capable of making the machine a risk to health and safety.

d) Repair and Maintenance - all machinery shall be shut down or positive means taken to prevent its operation while repairs, adjustments, servicing and manual lubrication is being made. Any guard or safety device removed while making repairs shall be replaced before starting operations again.

Positive means shall include one of the following:

(i) Lockout or isolation devices;

(ii) Danger tags;

(iii) Permit to work systems.

4.2 Plant Hazard Management

The Project Manager and/or Site Supervisor in consultation with the Site Safety Supervisor shall, when moving vehicles may create a risk to the wellbeing of employees or the public, devise safe systems of work which may include extra signage, warning devices, detours, speed restrictions, high visibility clothing, traffic lights and spotters/flagmen. The induction process shall highlight any such risks that may occur from traffic movements.

It is the responsibility of the designated operator to ensure that his machine is in good condition and is safe to operate. He must adhere to the FO 68 Plant Daily Inspection Checklist issued by the Operations Supervisor and report to his Site Supervisor, Project Manager or the Operations Supervisor any fault, major or minor, with his machine as soon as possible.

Where there is no designated operator, as is the case with small rollers or some hire plant it is the responsibility of the Site Supervisor to ensure that plant is safe, serviceable and practical to use.

Where external plant is hired and operated by Bardavcol employees, such as water carts, it is the Site Supervisors responsibility to ensure that the plant is inspected prior to use for roadworthiness and is fit for purpose. No person shall operate any item of plant if it is not roadworthy, not fit for purpose or is unsafe.

The Bardavcol Operations Supervisor maintains a register/history file of all Bardavcol plant detailing the specific plant number, make or type of plant, current hours or kilometres, and when the next service (as prescribed by the manufacturer or supplier) is required. The Operations Supervisor notifies the Project Manager or Site Supervisor responsible for the plant at the time when the service is due and arranges a suitable time for the service to be undertaken.

The Bardavcol Site Supervisor (or when subcontractors plant is being used on site, the sub-contractors site representative) is responsible for ensuring that he is aware of the capabilities and also limitations of all items of plant under his control.

All sub-contractor (including plant hire) plant and equipment provided and used on-site must be properly maintained in good working order with any safety devices in place and operational. Subcontractors must confirm the maintenance and servicing performed on each item of their plant every month that they are on site. This may be done by providing copies of service and maintenance records or a written statement

outlining the service and maintenance that has been performed for each item of plant. Where plant is not serviced or maintained in accordance with the manufacturer's requirements, it must be removed from operation until the service and maintenance requirements have been updated. Records of subcontractor plant maintenance and service must be retained in the project files on site.

The Site Supervisor, Project Manager or Project Engineer shall carry out random visual checks of all subcontractor plant and equipment prior to release on site using FO 32 Plant Permit To Work. Any equipment that appears to be faulty shall be removed from the construction area. Subcontractors are required to use daily checklists similar to Bardavcol's plant daily inspection checklist whilst working on a Bardavcol project.

No plant operator shall modify or use an item of plant in a way that is not recommended by the manufacturer or is likely to cause equipment damage, failure or injury to themselves or other people.

NO PERSON SHALL USE OR OPERATE ANY ITEM OF PLANT THAT IS UNSAFE FOR USE, NOT ROADWORTHY OR NOT FIT FOR PURPOSE ON ANY BARDAVCOL SITE.

4.3 Common Hazards Involving Powered Mobile Plant

Powered mobile plant is extremely hazardous when it is operated in situations where:

- there are people or other vehicles sharing the same site or roadway. Pedestrians and bystanders are particularly vulnerable in zones where mobile plant and machinery is operated as the operator's vision may be restricted and plant, which is apparently idle, may move with little warning
- there is uncontrolled entry to the site during and after work
- the plant is poorly maintained. There have been recorded instances where plant has been operated even when it was known that safety critical components, such as brakes and steering, were defective
- people carrying out maintenance are also at risk from passing traffic, from equipment falling while raised, and from heavy components, such as buckets, not being properly supported
- the plant is operated in the vicinity of overhead or underground electrical equipment (risk of electrocution to the operator and others in the vicinity of the plant)
- the base on which the plant operates is unstable (i.e. subject to slippage, subsidence or collapse)
- people use the mobile plant in an application for which the plant has not been designed (such as pushing, pulling or towing)
- the load on the plant is unstable or unknown or exceeds the rated capacity of the plant
- hazardous atmospheres are present, particularly in spaces where a flammable or explosive vapour maybe present e.g. enclosed spaces, trenches
- any other work is carried out near the work area.

4.4 Assessing & Controlling Common Plant Movement & Operation Risks

The majority of mobile plant used by Bardavcol has been risk assessed using FO 31 Plant Risk Assessment Form, and Safe Work Instructions plant series. Prior to use of plant on site a risk assessment needs to be conducted on the plant using FO 31 Plant Risk Assessment Form. A Safe Work Instruction may then be drafted based on the risk assessment.

Assessing the degree of risk means assessing how likely it is that someone will be hurt (including how often people are exposed to the risk) as well as how severely it could hurt someone. Priority for implementation of measures to eliminate or control risks should ensure that matters of the greatest likelihood and severity are addressed first. The measures chosen will depend on the degree of the risk.

Vehicle movement procedures should be developed based on the risk assessment and should be updated each time the conditions on the site change in a way that may affect the health and safety of persons at the workplace. It should also include an assessment of the visibility of plant and traffic from all areas of the work site.

The 2 specific documents that are required to be developed for Bardavcol projects are:

1) Traffic Management Plan – written plan for traffic controls at road works.
2) Site Movement Plan – this relates to movement of plant and vehicles within a project site. The Site Movement Plan should include parking facilities, speed limits, out of bound areas and high risk areas

such as excavations and bridges. This plan is to be communicated to Bardavcol personnel and sub-contractors and client personnel where relevant.

The use of specific measures to eliminate or control identified risks should be done on the basis of the risk assessment. In particular, consider the following:

- isolating vehicles and plant used in or around the site and work area from persons on the site or work area. For example, vehicles or persons may be guided around or past the work area
- using fencing, barriers, barricades, temporary warning or control signs, or a combination of these to
- secure the area where moving plant is used
- planning the direction that plant moves, so the visibility of operators is not restricted
- using spotters/safety observers to control traffic movement,
- implementing safe working distances
- using audible reversing alarms and/or other technologies or other safe work practices,

Note: reversing alarms may cause confusion where multiple plant are using the same area; other systems of work may be required. Reversing alarms may also be inappropriate where work is to be carried out at night near residential areas,

- minimising the amount of moving plant working at one time. Where multiple plant is operated around the work site a competent person should be used to direct the plant:
    - operating in close proximity to each other
    - when reversing
    - where persons are on the ground
    - in other situations as indicated by the risk assessment
- implementing systems of control and notices at all entrances and exits where construction vehicles or plant enter or leave the work area by public roads, to protect and warn all persons approaching or in the vicinity,
- identifying designated delivery and turning areas. The movement of delivery vehicles on construction sites often presents a hazard, particularly when reversing, loading and unloading. Procedures should be implemented to warn all workers of the potential hazard. These procedures should include:
    - the requirement for truck drivers to report to a suitably signposted area on the site and/or
    - the requirement for a designated worker to act as an observer to ensure all persons are clear of the
    - reversing vehicle, and
    - a system of communication and warning to persons near the delivery point.

4.5 Controls for the Safe Operation of Plant

Systems of work must ensure that moving plant is operated safely. At a minimum, consideration should be given to the following:

- competence of persons working with plant – only persons who are competent, and where required hold the appropriate certificate of competency in accordance with the Regulation, must be permitted to operate plant or perform any installation or maintenance work on powered mobile plant. Copies of licenses or certificates to use plant of all Bardavcol and subcontractor personnel will be obtained and retained on project records.
- capability of operators – operators should never be permitted to operate plant while they are under the influence of alcohol or any substance or drug, including prescription and non-prescription drugs, which may adversely affect their ability to operate the plant in a safe manner
- vehicle movement procedures for positioning and re-positioning of plant – these procedures should include specific procedures when plant is operated near persons, near underground or above-ground services, moving plant onto a public road from site or reversing plant
- suitability and condition (state of maintenance and repair) of the plant to perform the intended task – this should also include the size and type of equipment required, ensuring its reach, capacity etc. are properly specified and that log books are available

- instruction and information about hazards – all persons who perform work using (or on) powered mobile plant must be adequately instructed in the hazards associated with the plant and carrying out the work on site and in the control measures for safe work. Safe operating procedures should be available covering the use and maintenance of powered mobile plant
- available information – ensure that all available manufacturer's information on the safe operation of the plant is provided, and that essential operating information is displayed, e.g. rated capacity, radius and basic operating instructions are displayed on cranes
- special requirements – any special requirements should be clearly identified and communicated, e.g. As the need for the plant to move when fully laden, the requirement for any accessories such as special slings, spreader beams, load stability plates or matting and counterweights
- site conditions – any limitations posed by the worksite (such as floor loadings or ground load limits) should be checked by an engineer prior to selecting the appropriate plant for the task. Spoil stockpiles should be regularly removed.
- appropriate staffing – the number of personnel required to perform the tasks safely.

4.6 Stability of Plant

To ensure that plant is stable on slopes or uneven ground surfaces consider the:

- plant is suitable for use on the slope or uneven ground
- tyre condition and pressure
- risk involved in raising the load when the crane or load shifting plant is articulated
- load is properly secured before moving
- loads are loaded in a controlled manner, not dropped
- operators are paying full attention during the load shift or whilst operating moving plant
- carrying or lifting equipment is not overloaded. The rated capacity of the machine must be checked before operation and observed
- no persons are in the vicinity during unloading or tipping.

ROPS:

- If plant is NOT fitted with a ROPS cabin, the following activities are not permitted:
  - Operate on a slope that places the plant at risk of overturning;
  - Work next to an edge where the plant is at risk of overturning due to collapse of the edge or travelling over the edge

FOPS:

- If plant is NOT fitted with FOPS, plant is not to work in situations where there is a risk of objects falling onto any part of the machine from height.

4.7 Controls for Pedestrians Near Moving Plant

When plant is operated in close vicinity of other plant or people, a competent person should be used as a spotter. The operator should observe the following procedures:

- where practicable plant should always move in a forward direction
- ensure no persons are at risk before reversing
- avoid hazards by facing and maintaining attention in the direction of travel

- spotter should always be in the sight of the plant operator
- clear communication systems should be in place.
- Pedestrians (especially public) should be isolated from mobile plant/vehicle movements. If necessary, barriers should be installed.

4.8 Safety Controls on Plant

Safety controls such as guards, warning devices, auto stops etc., are fitted to the plant for protection and must not be removed or made inoperative unless authorised personnel (competent persons) are carrying out repairs and adjustments. In such circumstances, the guards etc, must be reinstated and be fully operational prior to returning the plant to service.

Equipment to be fitted to all Bardavcol plant:

- Reversing beeper
- Rotating/flashing lights

Optional Equipment to be fitted to plant:

- UHF Radio
- Grab rails for access/egress – depends on assessment of plant at acquisition
- Relevant signage as required

Safety controls for plant are also applicable to subcontractor equipment. Refer to FO 07 Bardavcol Special Conditions of Subcontract Regarding Safety.

4.9 Plant Safe Working Distance

All machines have large blind spots around them particularly in the rear. Always approach machinery from the front where possible, never attempt to climb onto a moving machine and always alert operator of your presence prior to approaching. It is the plant operators responsibility to ensure that any person, including visitors, maintain a safe working distance from his plant while it is being operated. The plant operator must report any incidents where any person fails to maintain a safe working distance to the Site Safety Officer or Site Supervisor immediately after the incident has occurred. The Site Supervisor shall inform the Project Manager and complete an incident report using FO 27 Incident Report Form if the incident may require further action to take place.

Depending on the severity of the incident the Project Manager may consider the following:

- Retraining of the person or persons involved.
- Removal of the person or persons from the area in question.
- Removal of the person or persons from the site.

4.10 Lifting & Slinging

A safe lift requires planning and must be carried out under the supervision of a competent/experienced person. No employee shall undertake any lifting / slinging operations unless they have received appropriate training and are aware of any Standard Operating Procedure or Safe Work Instruction that may apply to that particular lift.

Any lifting that may be **"Complex"** must be carried out by a qualified and licensed dogman. Any lifting that isn't **"Complex"** must be undertaken under the control of a competent person – a Site Supervisor or Leading Hand.

If a competent person is required to carry out a slinging/lifting task they must ensure that:

- They are aware of the approximate mass/weight of the equipment or materials being lifted,

- The plant undertaking the lifting is suitable for the lift – is the lift within the safe operating limits of the plant and attachments,
- An appropriate lifting position on the plant is used,
- **If using a 'quick hitch', it is positively engaged and the safety pin bolted or locked in place,**
- The slings, chains and other attachments are in good condition (inspected prior to the lift) and have evidence of being recently tested and tagged. Never combine slings i.e.: nylon and chains. Shackles must be used where slings are attached to eye bolts or lifting lugs. All hooks must be supplied with devices to prevent load movement. Chains and slings must be used for their intended purpose – that is lifting and within their SWL.
- Chains and slings must not be used to tow items of plant as this may unknowingly place a load which could exceed the SWL and also cause unseen damage to the chain or sling,
- No person is permitted to work, stand or at any time be under the suspended load. Personnel are not allowed to 'ride' a load, sling or hooks.
- Hard hats and highly visibility vests are worn by all persons in the close vicinity of the lift,
- The area has been inspected to make sure that it is suitable for the operation and secured from unauthorised persons. No unauthorised persons are allowed in the lifting/slinging area,
- That if the plant has outriggers or stabilisers attached, that these are used when required and firmly located,
- Loads are not to be left suspended without an operator at the controls,
- Any lifting over fuel/chemical lines is risk assessed and controls put in place to minimise the risk, i.e. boards over the fuel lines, area cleared of personnel, physical barriers etc.

All sites must ensure that a regular inspection of chains and slings is carried out and any suspect slings or chains are not used, appropriately tagged "Not for Use" and returned to the Bardavcol Workshop. The Workshop staff are to be notified when the suspect slings or chains are returned.

Lift studies must be prepared by a competent person for the following:

- Lifting of persons in a workbox;
- Lifting within overhead power line exclusion zones;
- Where the load is 10 tonnes or more;
- Where the loss of the load would have a serious impact on production operations;
- Tilt-up panel lifting;
- Multiple crane lifts;
- A lift >75% of the crane's rated capacity; and
- Any other lift, as required by the Bardavcol Project Manager

SIGNALS TO AN OPERATOR MUST ONLY BE GIVEN BY ONE TRAINED / COMPETENT PERSON

4.11 Tip Over Axle / Convertible Tipping Trailers

The use of any Tip Over Axle / Convertible Tipping Trailer i.e.: those trailers that pivot on the rear axle only to discharge their loads is discouraged on all Bardavcol sites. If the Project Manager / Site Supervisor is unable to use any other type of trailer then a risk assessment must be undertaken which must include the development of a Job Safety Analysis prior to any use of these types of trailers.

4.12 Maintenance and Inspection of Mobile Plant

Following the purchase of plant, the manufacturer's operating manual and any applicable legislation must be reviewed to identify the specific inspection and maintenance requirements. The plant details, including the maintenance requirements must be entered into the plant register within Cheops, including:

- plant name/type
- manufacturer
- model number
- registration or serial number
- maintenance frequency (e.g. month, hours, kilometers)
- when maintenance is next due
- the date when maintenance was last performed

The Operations Supervisor is responsible for ensuring that the plant register is maintained and that plant maintenance occurs at the specified intervals. The relevant plant operation data (e.g. hours, kilometres) is submitted to the Operations Supervisor at nominated frequencies and entered into the Hours/Kilometres Register to enable maintenance to be scheduled.

Maintenance must be performed in accordance with the manufacturer's requirements and may be performed by the manufacturer's agent or a suitably qualified mechanic. Maintenance records are documented and provided to the Operations Supervisor for review and ensuring that any further work (i.e. to rectify faults) is arranged. Maintenance records are to be retained in the workshop files.

Plant is inspected prior to the commencement of each shift by the plant operator and is documented on the FO 68 Plant Daily Inspection Checklist. The checklists are submitted weekly to the Operations Supervisor for review and to action any identified issues. The checklist shall be retained in the workshop files.

Any faults or damage to plant identified during the inspection must be recorded on the checklist and reported to the Supervisor immediately. Where a fault or damage is identified that may prevent the safe operation of the plant or potentially put other workers and the public at risk, the plant must be locked out, tagged out and not be operated until it has been repaired or deemed safe to operate by the Operations Manager. The Operations Manager may engage internal and external resources (e.g. competent persons) to assist with this process.

Details of faults or damage reported to the Operations Supervisor are recorded in a maintenance folder for each type of plant, with details of any repair or corrective action taken. Records of repair works are retained in the workshop files.

4.13 Inspection of slings, chains and lifting equipment

Slings, chains and lifting equipment (i.e. shackles, hooks, chain blocks) shall be inspected prior to every use by a competent person and include an assessment of the full length of the sling or chain for any signs of damage and ensure that a WLL tag is fitted.

In addition, periodic inspections will be undertaken:

- Every 3 months
  - by a competent person to assess all surfaces along the full length of the sling or every individual chain link for any signs of damage

  Slings or chains that contain any damage or fault must be removed from service (ie. tagged out) immediately.
- Every 12 months
  - by a recognized testing organization that is NATA accredited, in accordance with the applicable Australian Standards for the sling or chain

Periodic inspections may be conducted more frequently where the sling is used intensively and where conditions may cause damage (e.g. corrosive environment). Periodic inspections must be documented and records provided to the Operations Supervisor as soon as practicable following the inspection to ensure that corrective actions are undertaken.

Inspections undertaken prior to use and periodically must be undertaken in well-lit locations, free from extremes of temperate. The inspection of chains and slings must assess the following (as applicable):

- external and excessive wear
- local abrasion
- cuts and contusions
- internal wear
- damage to protective coating or sleeve
- damage from high temperatures
- sunlight degradation
- chemical attack
- label damage
- deterioration of stitching
- damage of any eyes
- damage at the any terminal attachment
- damage to any end fittings

Specific requirements for the inspection of chains include:

- clean the chain thoroughly.
- lay the chain out on a clean surface or hang it up in a well-lit area.
- every chain link should be individually inspected for any signs of wear, twisting, stretching, nicks, or gouging and any worn link measured to determine degree of wear using Vernier Calipers.
- master links and hooks should be inspected for any sign of wear at their load bearing points and for any signs of distortion, such as widening of hook throat opening.
- coupling links should be inspected for any signs of wear at their load bearing points, for excessive play of the load pin within the body halves and for impaired rotation of the body halves around the load pin.

Chain links or fittings having any defects should be clearly marked to indicate rejection and the chain sling should be withdrawn from service until properly repaired and retested prior to returning to service.

Chain slings that have damaged fittings may be repaired on-site by replacing the fittings (note: when reassembling coupling links it is recommended that a new pin and stud assembly be used), but must be proof tested after any modifications other than replacing safety latches that are not an integral part of a hook in accordance with AS3775.2.

The inspection must include any hooks and latches to be used with specific attention given to clearance between the hook and latch to ensure that it is within acceptable tolerances.

Slings and chains will be withdrawn from service immediately after the following:

- a dangerous condition of the sling or chain is suspected
- the label or tag is missing or illegible
- defective safety catches and self-locking hooks
- the cover or sewn sleeve has been damaged
- the stitching has been damaged
- a protective coating has been damaged
- an end fitting or coupling has been damaged (e.g. distorted, cracked, fractured or excessively worn or corroded)
- whenever the sling has lost 10% or more of its minimum breaking strength
- any of the load-bearing fibres are damaged (e.g. damage to a cover, surface chafe, cuts, fibres that are fused or glazed)
- any damage caused by chemicals (e.g. local weakening, softness of the cover, flaking of surface fibres), including situations where a:
  - nylon sling has come into contact with an acid solution
  - polyester sling has come into contact with an alkaline solution
  - polypropylene sling has come into contact with an organic solvent (e.g. wet paint, coal tar, paint stripping mixtures)

The Operations Supervisor is responsible for updating and maintaining the Bardavcol slings, chains and lifting equipment register. This register includes the following information

- reference number
- description (i.e. type of sling, chain, equipment)
- serial number

- purchase date
- date of introduction to service
- inspection dates
- test date
- condition
- next inspection date

Project Managers must ensure that a project slings, chains and lifting equipment register is maintained for those items used on the project. The Register must include details of slings, chains and lifting equipment used by Bardavcol and subcontractors, including records of periodic inspection dates.

5 Permits/Licences:

- FO 23 Excavation Permit
- FO 32 Plant Permit To Work
- Permits and licenses will be determined by the nature of the work being carried out.
- Refer to Project Management Plan

6 Emergency Response:

- Cease operating plant, shut down plant.
- Apply Danger Tag or Out of Service Tag as appropriate and contact workshop personnel.
- Make area around plant safe.
- Emergency Response Plan

7 Program Inspection:

- Plant specific inspection check lists as prescribed
- Preventative maintenance schedule as per manufacturer's requirements.
- Visual inspection prior to use.
- Any relevant pre-start checklists.

8 References:

- Work, Health & Safety Act, SA 2012
- Work, Health & Safety Regulations, SA 2012
- Code of Practice How to Manage Work Health and Safety Risks
- Code of Practice Managing Noise and Preventing Hearing Loss at Work
- Code of Practice Construction Work
- Code of Practice Managing Risks of Plant in the Workplace
- Code of Practice Excavation Work
- Code of Practice Demolition Work

9 Tools/Forms:

- FO 113 Safety Inspection
- FO 111 Induction Register
- FO 124 Site Induction Form
- FO 23 Excavation Permit
- FO 63 Hot Work Permit
- FO 07 Bardavcol Special Conditions of Subcontract Regarding Safety
- FO 31 Plant Risk Assessment Form
- FO 32 Plant Permit To Work
- FO 892 Project Management Plan Template