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<b>TITLE:</b> Engineering & Vehicle Workshops (Including Sandblasting)	<b>STANDARD:</b> 201
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### **Definitions (in relation to this Standard)**

Competent Engineering Workshops	trained, experienced and qualified area where repair, modification or fabrication of materials and components is conducted using specialist equipments such as woodworking machinery, lathes, pillar drills, pipe bending machines, presses, welding equipments etc..., or where specialist activities are undertaken such as spray painting or sand blasting
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### **Cross-References**

- Standard 205 – General Safe Working Practices
- Standard 206 – Housekeeping
- Standard 208 – Construction Plant & Vehicle Management
- Standard 209 – Small Tools
- Standard 227 – Welding Operations
- Standard 207 - PPE
- Standard 235 – Control of Hazardous Energy (Lockout Tagout)
- Standard 401 – Waste Management
- Standard 404 – Spill Response Management

### **Procedure**

#### **General**

1. Workshops must have a full-time dedicated and appointed competent person in charge.
2. Protection of the Environment must be considered on initial setting-up of all workshop facilities. Bunded fuel storage areas & spill kits must be provided. Make provisions for the segregation and collection of used oils and fuels.
3. Workshop machinery is to be installed, tested, commissioned, maintained and serviced by a competent person. Records are to be kept and made available to Royal Commission upon request.
4. Any tools, equipments or measuring devices must be calibrated as per manufacturer requirements; records to be kept and made available to the Royal Commission on request.

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5. Employees using any workshop machinery (including machinery to run the workshops) must be trained and competent in its use, and operate it according to the manufacturer's instructions.
6. All tools, machines and equipments must be inspected for defects by the operator before each use. All defects are to be immediately reported to the supervisor and taken out of use.
7. Repairs to vehicles and equipments are only to be performed by competent persons in a dedicated workshop environment unless an emergency situation arises. Only minor repairs and maintenance works are permitted to be undertaken (i.e. changing of batteries, changing of oil, oil & air filters, defective tires etc. Fitting and repair of back-up alarms and flashing beacons. etc.). All heavy maintenance works to be carried out off site at the contractors own, non-RC, premises (engine overhaul, gearbox works etc. are not permitted).
8. Waste fuels, oils, lubricants and rags are to be removed on a daily basis.
9. Only 1-days supply of oils and lubricants are to be stored in workshops.
10. There is to be a no smoking or eating policy in all workshops.
11. There are to be washing facilities nearby, with adequate hand drying facilities.
12. Barrier cream is to be made available to all workshop staff.
13. There is to be an adequate supply of Personal Protective Equipment (PPE) including non-permeable (rubber) gloves for all workshop staff.
14. There is to be adequate ventilation and lighting in all workshops. All lights to have covers and where necessary additional metal mesh guards.
15. No excessive amount of materials is to be stored in workshops.
16. All welding operations are to comply with Standard 227, specifically control measures for hot works.
17. There is to be an adequate supply of material to soak up all fuel/oil/lubricant spills (Spill kits); this is to be disposed of in accordance with Royal Commission Environmental standards. Where fuel, oil & lubrication systems are being worked upon, drip-trays must be provided.
18. There must be sufficient and suitable quantities of fire fighting equipments located throughout the workshop facility.
19. Only works directly related to the contract construction activities are permitted in any workshops.

### Engineering Workshops

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20. All fixed woodworking and metalworking machines must be fitted with a means of isolation from the electrical supply. The isolator switch must be lockable and conveniently positioned close to the machine.
21. Control of Hazardous Energy (LOTO) procedures must be implemented and followed during all routine and non-routine maintenance works. Only trained, experienced competent persons are permitted to implement and work on Locked & tagged pieces of equipment and machinery.
22. All fixed woodworking, metalworking and other machines must be fitted with interlocking guards that de-energizes the machine when opened.
23. All fixed woodworking and metalworking machines must be fitted with an emergency stop button within easy reach of the operator whilst at the work position of the machine; this must be separate from the start/stop button.
24. All fixed woodworking and metalworking machines must be fit for purpose, manufactured (no home-made), and operated as per manufacturer's instructions.
25. Floors around all fixed woodworking and metalworking machines must be kept in a good and level condition, being kept free from tripping hazards and changes in height. Electrical power supplies should be either routed above head height or set in the floor.
26. All fixed woodworking and metalworking machines must be switched off when not in use and must not be left unattended until the "cutter" has stopped turning.
27. There must be adequate space around each fixed machine to accommodate work-pieces ready for working, finished items and waste materials, without obstructing the operator whilst working the machine.
28. Adequate lighting must be provided at all fixed woodworking and metalworking machines.
29. Access routes and means of escape must be kept clear at all times.
30. Waste material must be stored in suitable scrap bins and emptied at regular intervals.
31. Wood dust is harmful to health and flammable. After each and every task, woodworking machines are to be cleaned by the operator to prevent build-up of wood dust.
32. Relevant PPE must be worn when operating all fixed and portable woodworking and metalworking machines as per the manufacturer's instructions.
33. All tools that present a risk of eye injury (i.e. saws, planers, grinders, pillar drills etc...) must have guards in place during operation.
34. Push-sticks must be used when operating all woodworking machines.
35. Abrasive wheels must only be changed by a competent person.

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- 36. Grinders will be provided with hood-type guards with side enclosures that cover the spindle and at least 50% of the wheel. All wheels will be inspected before and after each use for signs of cracks.
- 37. All moving parts of machinery that pose a risk of entanglement or crushing must be fitted and operated with a safety cover.
- 38. Workers are not permitted to wear loose clothing when operating machinery and equipments that poses a risk of entanglement.

### Vehicle Workshops

- 39. Vehicle workshops manager is responsible for managing servicing and maintenance schedule and records of all vehicles, construction plant and equipments. These documents are to be made available to the Royal Commission upon request.
- 40. Serviceable equipments or vehicles must not be stored in workshops; it is to be assumed by all persons that every equipment or vehicle is defective and requires repair.
- 41. All equipments and vehicles are to be drained of fuel before repairs commence. All drained fuels and oils are to be stored in correctly labeled containers.
- 42. All vehicles being worked upon must be chocked. All cabs and load carriers in the open position must be mechanically locked or chocked into position; gravity, balances or hydraulic rams are not to be relied upon.
- 43. No persons must be in a vehicle inspection pit or under a vehicle inspection ramp whilst a vehicle is being positioned, or whilst the engine is running (unless during testing, the exhaust fumes are being artificially directed away from the area).
- 44. All vehicles being positioned over a pit or onto a ramp must be guided by a banks-man (*Redman* trained).
- 45. Whilst not in use, the vehicle inspection pit must be covered with sturdy covers, or adequate arrangements are made to prevent persons or vehicles accidentally falling in. Covers must have signage applied("DANGER – hole below do not remove") .
- 46. A traffic management plan must be in place and displayed so as to control vehicle and pedestrian movements in the area. The principles of segregation of people and vehicles must be applied where possible. Minimize the need for reversing where possible.
- 47. Dedicated parking areas to be set-up for vehicles awaiting repair, or awaiting removal after repair.
- 48. There is to be a lockout / tagout system for all Hydraulic inspection ramps.
- 49. Only approved vehicle jacks are to be used for propping up vehicles; home-made jacks are strictly prohibited. All jacks must be set-up on a sufficiently strong concrete slab.

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50. Only vehicles and construction plant from that specific Project can be serviced in the vehicle workshop.
51. There must be a safety cage around all tire changing machines (Figure 1), and the mechanic must be outside of the cage during the operation. It is preferred that a safety trip-switch is fitted to the cage door to prevent operation of the machine whilst the door is open.



Figure 1 – examples of tire safety cages

### Spray-Painting & Sand-Blasting (including on-site blasting in situ)

52. There must be a dedicated area for spray-painting and sand-blasting; during planning and set-up, adequate attention must be paid to the vicinity, proximity of other workers, residential and industrial neighbors, known wind direction and traffic routes.
53. All electrical supplies, equipments and fittings within the designated area must be flameproof.
54. The area where spray painting / sandblasting is to be conducted must be screened off with non-flammable material, a controlled access point, and adequate warning notices 25m away around the entire area.
55. There must be no smoking, eating, drinking or welfare area allowed within 25m of the vicinity.
56. There must be adequate storage facilities for Personal Protective Equipment (PPE) / Respiratory Protective Equipment (RPE) and clothing for all operatives within the vicinity.
57. Only 1 day's supply of material, paints, thinners, additives, chemicals etc... can be stored within the spray-painting facility. Suitable and adequate fire fighting equipment must be at hand.
58. Sand used for sand-blasting must be non-silica. MSDS sheets to be provided for all blasting materials (including non-sand)

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59. There must be Material Safety Data Sheets (MSDS) for all materials, paints, thinners, additives, chemicals etc... used within the facility. Adequate First Aid supplies must be immediately at hand specific to the task, including a method of eye wash (eyewash station capable of flushing eyes for 15 minutes).
60. RPE must have a safety factor of 20 ASF or higher. See specific MSDS sheets. Same RPE to be used in the clean-up of used blasting materials. Air supply filters, hoods and hoses to be checked and maintained as per the manufactures manual. All compressors and fittings to be checked and maintained.
61. PPE and RPE must be inspected by the operator before each use, and formally by the Supervisor on a weekly basis. Records must be kept and made available to the Royal Commission on request.
62. No person may enter a sand-blasting or spray-painting area without wearing RPE, irrespective whether the task is being performed.
63. Workers in sand blasting areas must wear suitably rated hearing protection that is compatible with other PPE being worn.
64. Suitable warning signage must be posted around spray painting & sand blasting areas – including signage warning of high noise levels.
65. Contractor must ensure that all PPE types worn (hearing, respiratory, face, eye, skin etc.) is compatible and the wearing of one does not detract from the usefulness of the other.
66. Oxygen supply equipment (including clean air filtration systems) must be checked and inspected by a competent person (third party certification) on a regular basis. Records to be kept on site.
67. Compressors, hoses and tools must comply with Standard 208 – Construction Plant & Vehicles, specifically that all hose connections shall be fitted with whip-checks.

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