

CONSTRUCTION
Training Group

LEARNER GUIDE

**Vacuum Truck
(VACT)**

**Non Destructive
Digging (NDD)**

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ASSESSMENT GUIDELINES – GENERAL

1. Introduction

1.1 Scope

These general guidelines for assessment are based on that prescribed by the *National Guidelines for Occupational Health and Safety Competency Standards for the Operation of Load shifting Equipment and Other Types of Specific Equipment*.

Assessors should also be familiar with the publication *Assessment guidelines for National Occupational Health and Safety Certification Standard for users and operators of industrial equipment*. [NOHSC: 7019]

1.2 Additional Guidelines

Guidelines which provide additional specific information to certificate assessors are also included in each assessment instrument. Included, where appropriate, are specific instructions on the usefulness of training records (such as logbooks) and other certificates with overlapping competencies.

1.3 Evidence of Competence

Evidence of competence is established in a number of ways. The methods used in the following instruments involve:

- Assessment of practical performance
- Written and/or oral answers to questions on underpinning knowledge.

2. Preparing for the Assessment

2.1 Study the instruments

You need to read the assessment instruments and specific instructions carefully before beginning an assessment.

2.2 Confirm Appointments

Prior to an assessment, you need to confirm the date, time and location of the assessment with the applicant and any other relevant people.

2.3 Equipment Availability

The availability of equipment, materials and a suitable working area must be organised and confirmed, prior to the assessment.

2.4 Workplace Factors

Because procedures vary greatly between workplaces, it is important for assessors to plan their approaches to meet the requirements of the individual workplace. Make sure you take the timeframe into account when planning the assessment and also make the applicant aware of any time limits.

2.5 Selecting Questions

Questions for the written/oral assessment should be randomly selected, either by hand or using the computer system, if applicable.

3. Conducting the Assessment

3.1 Provide an Explanation

Begin by explaining clearly to the applicant what is required of them. Check that the applicant has provided (or has been provided with) the necessary tools and equipment.

3.2 Practical Performance

Complete the practical performance checklist, as the applicant works through the required tasks. Wherever possible, this should be done in a normal working environment.

Do not ask the applicant questions while he/she is performing a task, as this can be distracting, and may affect the time taken to complete the assessment.

If, at any time, the applicant is endangering themselves or others, stop the assessment immediately.

This indicates that the applicant is not yet competent and may require further training, before being reassessed.

Assessments should also be stopped, if equipment or property is likely to be damaged.

3.3 Knowledge

The knowledge assessment covers both oral and written exercises. The model answers provided with the knowledge assessment instruments are not necessarily exhaustive. Use your own judgement when scoring alternative answers.

3.4 Recording Responses

Each item and question on the assessment form you use is accompanied by a box. Assessors must complete every box as follows:



CORRECT PERFORMANCE/
ANSWER



NOT YET ACHIEVED



NOT APPLICABLE

If a box is marked incorrectly, cross out the mistake, mark the correct response alongside, and initial the change.

4. Determining Competencies

4.1 Assessment Summary

A specific assessment summary is given for each certificate class. This is to be filled in and signed by the assessor and counter signed by the applicant.

4.2 Competency Requirements

In order for you to deem an applicant competent, he or she must have completed each section of the assessment to the standard required. You should note any time constraints when arriving at your decision.

The standard required for each instrument is specified in the specific guidelines and/or on the summary page at the end of each instrument.

If the case of a re-assessment, the assessor can decide to apply the whole or only that part of the assessment not yet achieved.

4.3 Additional Comments

Where an applicant fails to meet the standard of competence, you should add a written comment on the Assessment Summary, which briefly explains the problem.

Advice to the applicant, on the appropriate remedial action should also be included. This will also assist the certificate assessor, in the event that the applicant undergoes future reassessment.

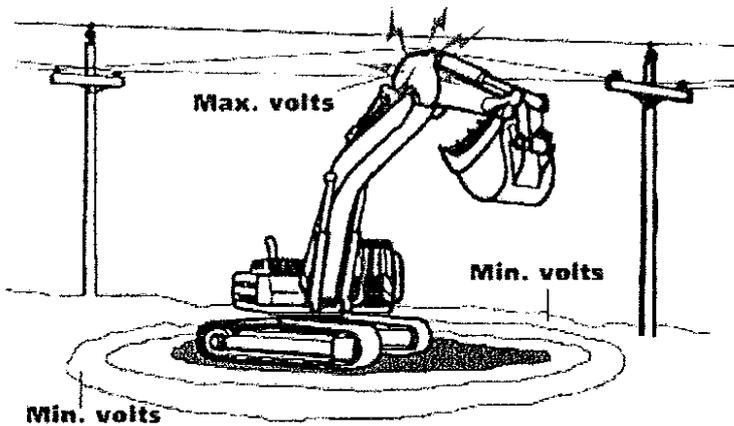
Likewise, if an applicant demonstrates outstanding or remarkable performance, this should be noted.

4.4 Further Investigation

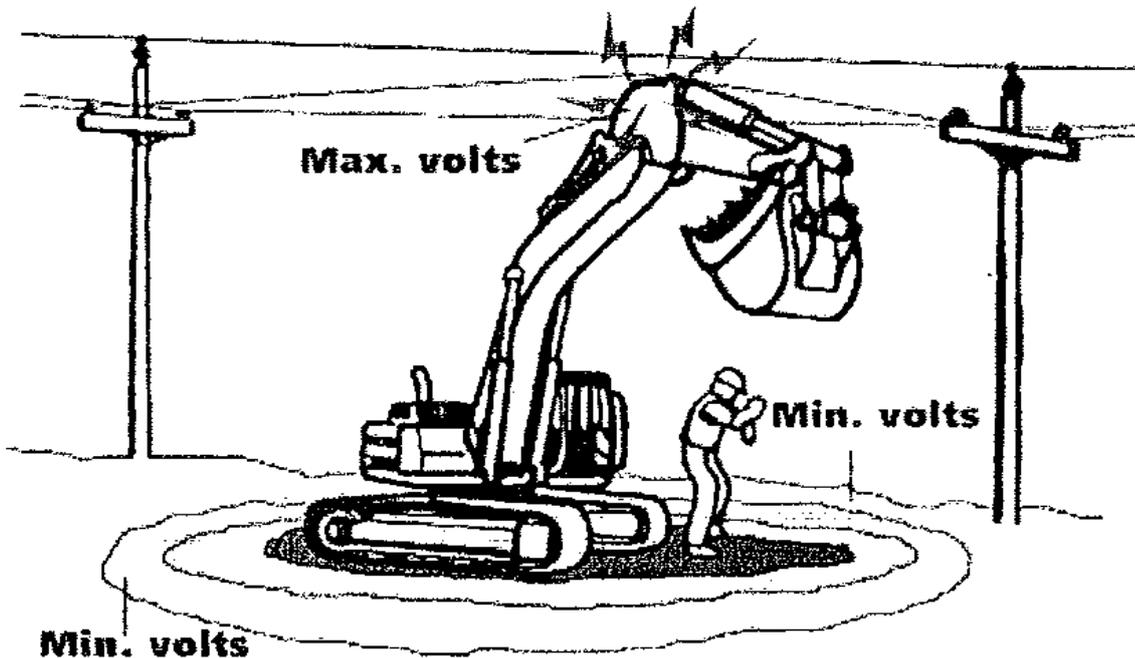
As a certificate assessor, it is your role to determine whether or not an applicant has achieved the standard necessary for the certifying Authority to be able to grant a certificate of competency.

Whenever you are unsure of the applicant's performance or knowledge, ask additional questions, and obtain additional evidence, before making your final decision.

Diagram 1:



If anything touches a high-voltage power line or if a power line falls to the ground, electricity will flow to the ground energising the tree or equipment and anything in contact with it. The surrounding ground may be extremely hazardous. The voltage gradually decreases from the point of contact until it reaches zero. The safe distance shown here—10 metres — is for line voltages up to and including 66 kV (66 000 V).

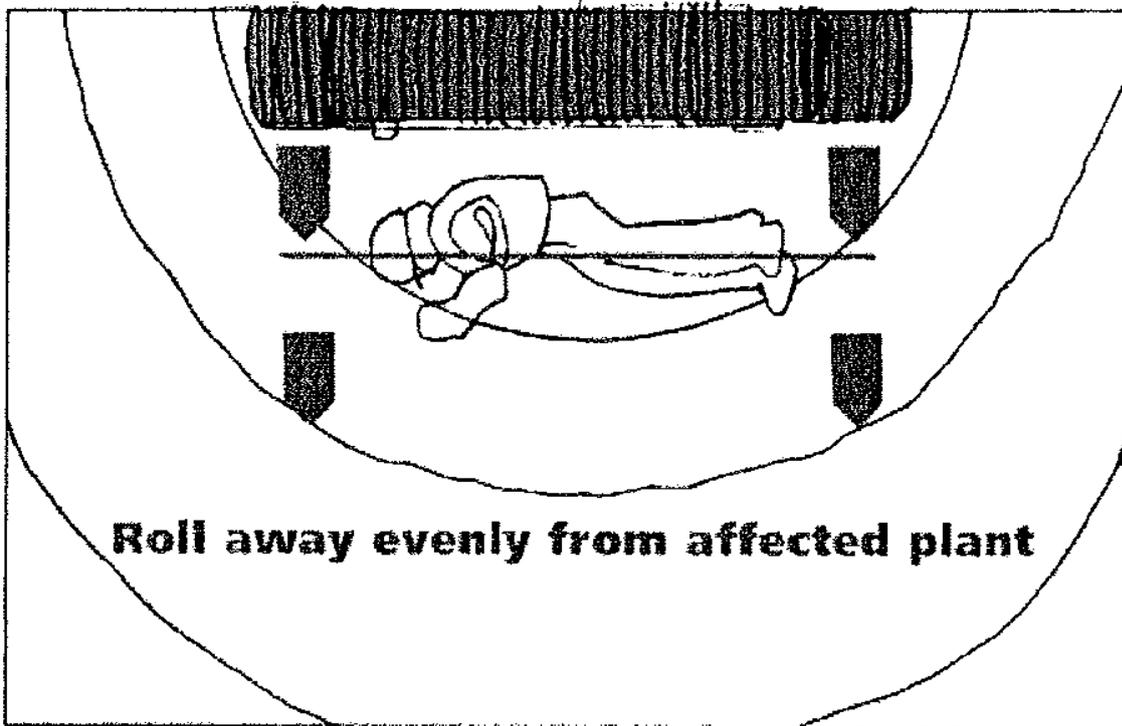
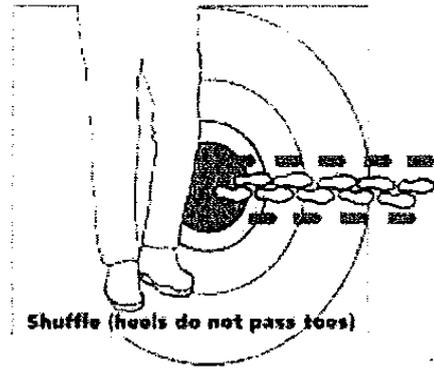
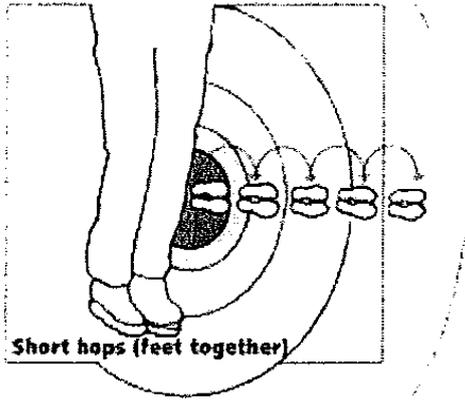


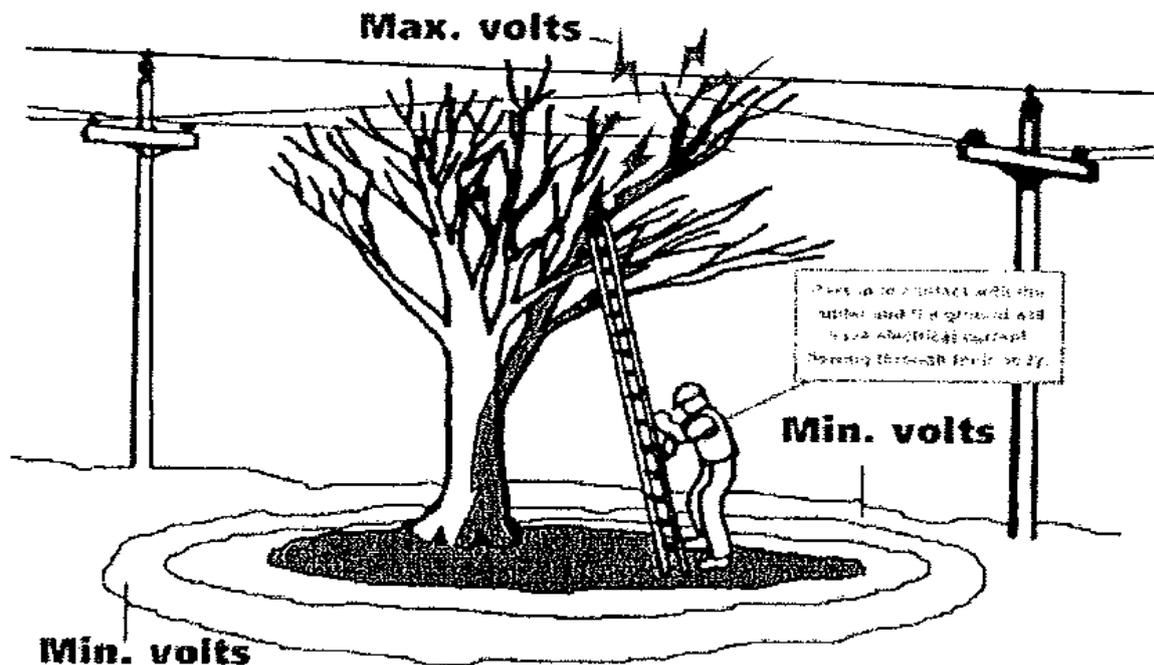
Step potential

Step potential is the voltage difference between two places that are a step apart on energised ground. For example, if you are standing on energised ground, there could be a significant difference in voltage between where one foot and the other are placed, and an electric current could flow up one leg and down the other.

Step potential. If your feet are spread apart on energised ground, electricity can flow through your body from the area of higher voltage to the area of lower voltage

If your feet are close together and touching, you are fairly safe. Since there is almost no voltage difference between the places your feet stand, there is little reason for electricity to seek a path through your body.





Touch potential

Touch potential is another danger that comes from the difference in voltage. It occurs when you touch something that is energised while standing on the lower voltage ground. For example, if some equipment is in contact with a power line, it will be energised to the same voltage as the power line; the surrounding ground will be energised to a lower voltage. If you touch the energised equipment or tree at the same time as you touch the ground with your feet, electricity will flow through your body from the higher voltage equipment to the lower voltage ground.

Touch potential: Trees and equipment become energised when they contact a power line. Electricity can flow through a worker who touches the energised tree or equipment, often causing serious injury or death.

Currents greater than 75 mA can cause ventricular fibrillation (rapid, ineffective heartbeat) and will cause death in a few minutes.

National Guidelines for OHS Competency Standards

Vacuum Truck/NDD

PART ONE

PERFORMANCE ASSESSMENT

Assessor Guidelines – Specific (Performance Assessment)

ASSESSMENT INSTRUMENT – SPECIATIONS

The following performance assessment covers the Standard elements 1.1, 1.2, 1.3 & 2.1, 2.2 & 3.1, 3.2

1. The assessment requires the operator to check the equipment, plan the work and to safely and competently operate, the equipment.

The assessment is performed in three sections:

1.1 Conduct routine pre-operational check of Vacuum Truck/equipment and the security of attachments.

1.2 Inspect the site, plan the work and select and fit the appropriate attachments.

1.3 Conduct pre-operational and post start up checks.

1.4 Drive the Vacuum Truck to the work area.

1.5 Operate the Vacuum Truck

1.6 Shut down the equipment and secure the site

2. Prior learning and experience

2.1 An applicant who holds a Tip Truck &/or Heavy Vehicle certificate does not require assessment in sections 2, 3 & 4.

3. The performance assessment can be conducted at any location which has

- Sufficient clear space to operate the machine
- Ground suitable for adding water

4. Equipment and resources required:

- A Vacuum Truck and equipment
- Suitable site on which to use the Vacuum Truck

5. Unless other arrangements are agreed to by the assessor, it will be the responsibility of the applicant, applicant's employer or trainer to provide the required equipment and resources.

6. To be assessed an applicant must wear:

- Safety helmet (where required)
- Appropriate footwear
- Other protective clothing and equipment as appropriate.
- Long hair tied back/in bun/under hat

7. The performance of each applicant is to be recorded on the assessor's checklist.

8. Safety of personnel:

When an applicant is working dangerously, recklessly or without the necessary co-ordination, the assessor must direct the applicant to cease work and terminate those parts of the assessment immediately.

9. The applicant must undertake all performance criteria. An assessor must use his/her discretion in assessing competence under each criterion.

The elements under each criteria must be marked with the appropriate tick, cross or N/A to indicate an applicant's competence level for that element.

Assessor Note: All performance criteria marked with a grey box are compulsory/critical. To determine a person's competence under each performance criteria, a prescribed number of elements are required to be demonstrated/answered under that criterion. The applicant must achieve the minimum specified number or more, of the performance elements to achieve competence for those criteria. To record the applicant's competence for the criteria a tick must be placed in the box.

10. Where a performance element cannot be performed the assessor can simulate or ask a question. The response must be placed in the box.

11. Where an applicant is assessed as 'not yet competent' he/she must be informed of the reason(s) in order to gain further appropriate training.

12. The full performance assessment can take up to 1 hour.

13. The general assessment requirements are set out in Assessors Guidelines – General

14. Competence is achieved for a unit when the required number of shaded boxes for that unit has been ticked.

Overall competence is achieved when competence in all units has been achieved.

Conduct Routine Checks:

1.1 Routine checks on vehicle/equipment:

Tyre condition and inflation, condition of wheels.

(Checks at least 10 including 2 shaded)

Checks liquid levels:

- Fuel
- Hydraulic oil
- Engine oil
- Coolant
- Transmission
- Battery

Checks equipment for defects:

- Damaged or broken parts
- Safety Guards and covers
- Warning signs
- Hoses and fittings
- Loose nuts, bolts
- Grease holes and grease pins
- Connections for missing pins or keepers

Plan Work and Check Equipment

1.2 Inspects site and plans work

(checks at least 7 including 2 shaded)

Identify Hazards

- Traffic and Pedestrians
- Obstructions
- Open Trenches
- Soft and sloping edges
- Restricted operator vision area
- Filling site
- Power lines, phone lines
- Service drains

Access and path of movement is indicated

- To work area
- For work

Appropriate equipment for the task

- Equipment is appropriate for the task

Operational Checks

(Checks at least 12 including 8 shaded)

1.3 Conducts pre-operational and post start-up checks in accordance with manufacturer's specifications/operating manual.

- Mounts correctly
- Adjusts seat, secures safety belt
- In neutral, park brake on
- Warning device
- Turn signals
- Stop/tail lights
- Head lights
- Starts engine
- Gauges
- Warm up allowed
- Clear for travel
- Foot brake
- Parking brake
- Reverse Alarm
- Steering

2. Drives Unit:

(Checks at least 18 including 9 shaded)

2.1 Drives to the work area

- Ensures travel direction is clear
- Selects appropriate route
- Travels at safe speed
- Obeys road rules and warning signs

2.2 Vacuums/Blasts/Discharges waste

- Positions Vacuum Truck in correct position for job requirement
- Operates Vacuum unit as per instructors directions
- Checks that work area is clear of other plant/vehicles before moving off
- Locates lockout key on boom & demonstrates operation
- Maintains safe distance from trenches as directed by supervisor, site instructions, signing or barricades
- Uses transmission, brakes correctly
- Observes job site guidelines as per job site instructions

Maintains safe following distance with other plant/vehicles

Travels at safe and acceptable speed

Drives Vacuum Truck to site conditions, e.g. mud, restricted areas, inclines, rough ground, slippery ground, sand

Observes site specific guidelines while on site (if applicable) *Note: If not applicable the assessor is to verbally ask the applicant why these areas should be avoided*

Avoids travelling across sloping ground if possible when driving an articulated Vacuum Truck (if Applicable) *Note: If not applicable the assessor is to verbally ask the applicant why these areas should be avoided.*

Checks discharge area is clear

Obeyes directions given by supervisor (if applicable)

Checks rear view mirrors before reversing, aware of personnel/other plant etc

Aware of danger areas e.g. obstructions, edges, excavations, overheads

When discharging uses wheel stops, safety barrier, body level

Gives way as appropriate to other plant and vehicles

Signals are interpreted and observed

3.1 Shuts down equipment and secures site **(Checks at least 7 including 4 shaded)**

Parks equipment –

Machine in correct area

Machine parked in suitable area

parks away from dangerous areas

Shuts down equipment –

Neutralises controls

Sets parking brake

As per Operation Manual

Post operational check –

Checks for leaking valves

Minor servicing

Checks and reports any damage

Avoiding hazards –

Removes keys

Locks cabin (if applicable)

3. Shuts down equipment and secures site:

National Guidelines for OHS Competency Standards

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ORAL/WRITTEN ASSESSMENT

Assessor Guidelines – Specific (Oral/Written)

Assessment Instrument Specifications: The oral/written assessment covers the following elements 1.1, 1.2, 1.3 & 2.1, 2.2 & 3.1, 3.2

1. Oral/written assessment for Vacuum Truck is divided into three units
2. To satisfy the requirements for competency the applicant must correctly answer (either in writing or orally) all critical questions as indicated by a shaded box and a minimum of 75% of the non-critical questions from each unit.

Assessor note: The assessment summary specifies the appropriate number of non-critical questions to be achieved.

Unit 1.

- | | |
|----------------------------------|------------------------------|
| 1.1 Conduct routine checks | Select 9 including 5 shaded |
| 1.2 Plan work | Select 14 including 6 shaded |
| 1.3 Check controls and equipment | Select 3 including 2 shaded |

Unit 2

- | | |
|---------------------------------------|------------------------------|
| 2.1 Drives Unit to Work Area | Select 3 including 3 shaded |
| 2.2 Load, Transport & Discharge water | Select 12 including 5 shaded |

Unit 3

- | | |
|-------------------------|-----------------------------|
| 3.1 Shut down equipment | Select 3 including 2 shaded |
| 3.2 Secure site | Select 1 |

3. Prior learning and experience:
An applicant who holds a Tip Truck &/or Vacuum Truck certificate who answers questions for performance criteria for 1.1 and 2.2 satisfactorily is not required to complete the rest of the assessment.
4. The full oral/written assessment of 45 questions can take up to 1 hour to complete.
5. The items in the shaded boxes are of critical importance. Failing to get any of these correct means that competency has not been achieved and the applicant must fail.
6. Competence is achieved for a unit when the required number of boxes for that unit have been ticked or marked correct.

Overall competence is achieved when competence in all units has been assessed and achieved.

**CONDUCT ROUTINE CHECKS:
(Select 9 from Q1-16 including 5 shaded boxes)**

1. What precautions must be taken when an inspection or work has to be performed under the raised body of

Vacuum Truck Non Destructive Digging Learner e

the Vacuum Truck?
Use a Safety bar or Props

2. What should be the first check of your Vacuum Truck at the start of your shift?

- Walk around it looking for visual defects
Pre Start checks
3. What should you do before starting the Vacuum Truck?
A safety belt, Neutral and check all clear before moving off
4. What warning device should function on the Vacuum Truck to warn personnel that the Vacuum Truck is to travel, or is travelling in reverse?
A reversing or motion warning alarm
5. If an air system were installed on the Vacuum Truck what daily action would you take with condensation in the air receiver?
Drain the water from the tank
6. Name three defects that you would look for when conducting a routine check on the hydraulic system of the Vacuum Truck if fitted.
Hydraulic oil leaks, loose connections and hoses for splits, fractures or bulges
7. What problem bubbles or milky engine oil in the sump could indicate?
Water leaking into the sump
8. Why shouldn't the hydraulic oil storage tank be filled above the full mark?
Space in the tank is needed for displacement in the system
9. When changing a battery which battery clamp should be removed first?
The earthed battery clamp
10. Name five pre-operational checks that should be carried out on the Vacuum Truck before it is started.
- Radiator, battery, fuel, oil, hydraulic lines, tyres, attachments etc.*
11. How would you remove the radiator filler cap of a Vacuum Truck that has not completely cooled off?
Best to wait but if you must then, Using a rag, slightly loosen cap to release pressure and then slowly remove cap
12. How should you establish that pre-start checks have been carried out?
Check operator's log
13. Why shouldn't tyres be checked while they are still heat affected from the effect of travelling?
Pressure in tyres would be increased by heat
14. How would you establish the service and the frequency of the service to be carried out on the Vacuum Truck you are required to operate?
By the service manual provided by the manufacturer.
15. What checks should you make to the seals of the holding tank of a vacuum/jet track
That they are sealed and not leaking
- 16; What is the danger of not having the hose fully inserted into the pipe before turning on the pump
The hose can be ejected violently causing injury or damage
- PLAN WORK:**
(Select 4 from Q17-23 including 3 shaded boxes)
17. What hazard would you look for and avoid establishing the most appropriate route to travel?
Sloping, soft or rough terrain, obstructions such as trees, stumps or rocks and underground services

*Bridges, Trees, Road load limits
obstructions, underground services*

18. What would you refer to in order to establish the location of underground services?

Supply authority or council maps, Dial B4 U Dig

19. What are some of the unusual hazards that a vacuum truck user might encounter?

Toxic fumes, liquid waste products, Hydrogen sulfide gas (H₂S), potential flammable atmosphere, chemicals

20. What are some of the tasks a Vacuum truck can be used for

Culvert cleaning, Clean up of chemical spills (Caution) De Watering, Interceptor pit clean outs, Clearing pipe blockages, exposing underground services

21: Name 6 Hazards related to using a vacuum/jet truck

Toxic fumes, Biological hazards, Sewer gases, Open manholes, Static electricity, Flammable atmosphere, Spills, Explosion of tank, Falls from height, Confined spaces,

22. If you accidentally damage an electrical cable whom would you immediately contact to render the power supply safe?

The electrical supply authority.

23: What should you do if you are cut while using a vacuum/jet truck

Ensure cut is properly cleaned and seek medical attention

(Select 3 from Q24-29 including 1 with a shaded box)

24. What should be provided to prevent a person falling into a trench or

*excavation?
Signs and barricades*

25. How should the flow of road traffic be controlled where signs and barricades are considered inadequate to control a potential hazard?

By traffic controller or by police

26. When should ear protection be worn? Where the noise could contribute to the loss of hearing over 85DBA

27. When should a person wear a safety helmet? Where the person could be struck on the head

28. What permit must be obtained prior to entering the holding tank of a vacuum/jet truck? A Confined space permit

29. What is the minimum type of footwear that an operator should wear to operate a Vacuum Truck? Non-slip footwear, steel cap boot.

(Select 2 from 30-31 including 1 with a shaded box)

30. Which is the preferred route of travel, diagonally across or directly down a sloping surface? Directly down the sloping surface

31. What gear should be selected to travel down a steep sloping surface? A low gear. The gear required to climb the sloping surface

(Select 1 from Q32-34)

32. In hazardous working areas where permission is required to work what must the operator ensure before the work is commenced?

That the required permits have been obtained

33. If the Vacuum truck is parked so that it protrudes into a footpath or driveway what must be provided?
Barricades and signage

34. What license do you require to drive a vacuum truck?
Relevant VicRoads Licence ie HR

(Select 3 from 35-39 including 2 with a shaded box)

35. Is it permissible to carry passengers on the equipment?
Yes if a seat & seat belt. No if no seat &/or seat belt.

36. How would you establish the capabilities and limitations of the Vacuum truck?
Manufacturer's manual

37: What are the dangers around using a water lance?
High pressure water up to 40,000psi can cause injury

38: If injured by a high pressure water jet what must you do
Seek medical attention immediately

39. What position should the body of the Vacuum Trucks before moving off after unloading?
Lowered and locked into place

1.2 Check Controls and Equipment
(Select 3 from Q40-43 including 2 with a shaded box)

40. What actions would you take with damage and defects found on the Vacuum Truck?
Report damage or defects. Refrain from operating. Tag out plant

41. What controls would you test to ensure that the Vacuum Truck could before it is driven ?
Brake controls, Steering, reverse alarm, mirrors

42. On the post start-up check you notice a bulge from in an Hydraulic line. What action would you take?
Switch off the machine, Don't use it, Tag it out and report it.

43. When should the operator on the Vacuum Truck that is to be operated make tests, checks and inspections?
Daily before use.

DRIVES UNIT
(Oral)(Select 1-Q44)

44. Applicant to state the meaning of the hand signal of "stop" demonstrated by the examiner
Stop operating

(Select 2 from Q45-47 including 2 with a shaded box)

45. How would you dismount from a Vacuum Truck that has contacted live power lines?
Jump clear ensuring contact with the ground and Vacuum Truck is not at the same time, Shuffle away 10m, Keep area clear.

46. When travelling, what would you do before travelling down a steep grade?
Reduce speed and select the appropriate gear for the grade.

47. Before reversing a Vacuum Truck what precaution should be taken? *Ensure the direction of travel is clear, head checks*

2.2 Load, Transport & discharge water
(Select 11 from 48-60 including 5 with a shaded box)

48: If using a vacuum truck in an area where members of the public could

enter the work area what must be provided

Safety barriers signs and an exclusion zone, spotter

49: What safety device should be installed on the vacuum truck pressure system

Pressure relief valve

50. In addition to service brakes, for what purpose is an engine break fitted to Vacuum Trucks?

Control the speed of the Vacuum Truck without excessively using and overheating breaking systems

51. What precautions should be taken before raising the body of the vacuum truck?

Check for all overhead hazards Power, trees, buildings etc,

52. Why is it important to place the Vacuum Truck in the correct position for offloading?

To minimise spillage, which could be an environmental issue

53. If you notice fluid leaking from the vacuum truck as you were driving what would you do?

Pull over in an appropriate spot and stop the leak

54. Why must caution be shown when travelling on sloping ground with an Vacuum Truck.

Explain your answer.
Vacuum Truck may tip over on sloping ground. High Centre of gravity.

55. After unloading the contents of the Vacuum truck what is a critical check before moving off

That all the valves are closed off and the caps are on

56. Why is it important to obey the spotter's directions?

The spotter has better vision of potential hazards

57. What safety precautions must be taken when the Vacuum Truck operator when working near a bank or trench? List two.

Safety barriers, spotters, tapes, guide posts.

58: Where must the contents of the vacuum truck be offloaded

At an authorised waste disposal site

59: What PPE should a Vacuum/Jet truck operator wear?

Safety glasses, Steel capped gumboots, Gloves, HiViz, Hardhat, waterproof overalls.,

60. What gear should the truck be in before engaging the PTO ?

Neutral

**SHUT DOWN EQUIPMENT
(Select 3 from Q61-65 including 2 shaded boxes)**

61. Name the areas where you would not park the Vacuum Truck

Access ways, near overhangs, refuelling sites, tidal or flood areas, adjacent to an excavation, on roads.

62. Where possible, what type of surface should be selected to park the Vacuum Truck on?

A firm level surface

63: What are the risks of using a vacuum truck in an enclosed space

Carbon monoxide poisoning

64. Would you park a full vacuum truck next to a storm water drain overnight ? Explain why or why not

No if it leaks it could contaminate water ways

65. What post-operational checks the operator on the Vacuum Truck to prepare it ready to be reoperated should carry out?

3.2 Secure Site
(Select 1 from Q66-67)

Check structure and equipment for damage, defects and wear.

66. What shall be provided when a Vacuum Truck has to be parked on or protrudes onto an access way?
Barricades, lights and signs

67. For what reason should the key be removed from the ignition of the Vacuum Truck?
To prevent unauthorised movement

Assessment Summary

Vacuum Truck/Non Destructive Digging

Unit	Form of Assessment	Total No of critical boxes in the assessment	No of boxes given ✓ or N/A	No of boxes required to meet standard	Were all critical boxes given ✓ or N/A?		Assessment standard requirements achieved*	
					Yes	No	Yes	No
	Knowledge	26		22	Yes	No	Yes	No
1	Performance	29		24	Yes	No	Yes	No
Assessment completed within time allowed							Yes	No
	Knowledge	15		13	Yes	No	Yes	No
2	Performance	18		14	Yes	No	Yes	No
Assessment completed within time allowed							Yes	No
	Knowledge	4		2	Yes	No	Yes	No
3	Performance	4		3	Yes	No	Yes	No
Assessment completed within time allowed							Yes	No

* Performance Standard = Number of items required to meet standard (including all critical boxes)
 Knowledge Standard = Number of questions required to meet standard (including all critical boxes)

Summary

Candidate is: ➤ Competent Date:
 (circle the result obtained) ➤ Not Yet Competent

Name of Assessor: Name of Candidate:

Signature: Signature:

Comments/feedback
 (Assessors to make any additional comments which clarify the assessment)

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