RIICPL401E
SUPERVISE THE INSTALLATION OF UNDERGROUND SERVICES USING OPEN EXCAVATION

THEORY EXAM

Participant name	

FOR THE PARTICIPANT

Instructions

- You will complete written questions as outlined on the following pages. You must attempt all questions and provide enough detail in your response to demonstrate your knowledge
- It is anticipated that you should complete this assessment within two (2) hours, but additional time may be allowed upon negotiation with the Assessor
- You must complete all questions unassisted by the Assessor or other personnel but may refer to reference material as needed. All questions must be answered correctly for a 'Satisfactory' assessment outcome to be awarded.
  - An oral examination may be allowed under certain circumstances, whereby your answers will be documented by another party.

Any written questions that are incomplete, or not answered satisfactorily will need to be completed again after further training support.

If you answer a question incorrectly but modify your response, put your initials next to the written change (or the Assessor must initial a verbal change).

Resources required

Pen

FOR THE ASSESSOR

Instructions

- Where oral examination has occurred, ensure that this is acknowledged in writing (e.g. FT001 and Assessor Comments)
- All questions must be satisfactorily demonstrated by the Participant for a Satisfactory determination (indicated by an Assessor tick to the right of the question).
- Assessors are to complete marking in pen of a different colour to the Participant.
- If the Participant verbally modifies their response, write in the modified response verbatim and put your initials next to the written change.

ASSESSOR COMMENTS

As necessary, outline:

- Details on reattempts, alternative arrangements or reasonable adjustments made.
- Where a Participant is deemed 'Not Satisfactory', provide recommendations for future training.

Q1. **You have been assigned the task of supervising open excavation for installing services. Complete the table below describing documents you need to review to confirm the work activity and compliance.**

Answer

Type of document	Documents required
Project documents	e.g. contract drawings and specifications communications plan project brief and work breakdown structure site plan traffic management plan site safety plan supplier list Resources list/s road authority specifications excavation plan job plan excavation and trenching permit
Guidance documents	e.g. code of practice manufacturer guidelines and specifications SWMS SDS Australian Standards
Legislation	e.g. Site Safety Plan Risk Management Environmental Management Plan HR documents including individual HR files to confirm availability of human resources

Q2. **What type of information are you expecting to locate from the documents listed in Q1. ?**

Answer

Should reflect but is not limited to: Project name, relevant stakeholders, Commencement date and targeted completion date, Site location and layout. Site safety plan, traffic management and emergency management Job technical details including which underground service to be installed, type of terrain, characteristics of soil and rock to be excavated, presence of surface or underground water and presence of other underground service. The excavation plan including approximate excavation quantities, type of machinery that will be used and method for protection of trenches. Main health or safety concern, Main environmental concern and special protective equipment that might be required.

Q3. **What are three (3) considerations you make as part of risk assessment processes during the 'walk-through' of the work area?**

Answer

1. Should reflect but is not limited to: existing structures and utility services, environmental conditions including weather and climate, soil type to be
2. excavated and disposal requirements, worker and the public safety; the nature of the task and associated risks not yet addressed or controlled;
3. Unexpected or potential hazards and risks.

Q4. **How would you divert runoff around stockpiles unavoidably located in drainage paths?**

Answer

Should reflect but is not limited to: an up-slope perimeter bank; diversion drains or other suitable methods for the site.

Q5. **All workers must wear the PPE required by the site. Why is it particularly important for supervisors?**

Answer

Should reflect: to set a good example; to demonstrate how to adhere to workplace requirements.

Q6. **Where does the use of PPE fit in the risk management process?**

Answer

Should reflect but is not limited to: The use of personal protective equipment is lowest on the list of control priorities. These controls should not be relied on as the primary means of risk control until the options higher in the list of control priorities have been exhausted.

Therefore, PPE should only be used:

as a last resort, where there are no other practical control measures available;

to be a short-term measure until a more effective way of controlling the risk can be used;

together with other controls measures such as local exhaust ventilation

by itself during maintenance activities.

Q7. **What would you read in the job plan to confirm the plan meets task requirements?**

Answer

Should reflect but is not limited to: Read the scope of the works and the job plan requirements to confirm the works schedule meets quality requirements set by sponsor or authority in the specifications. Check that the schedule does not have components that conflict with other work team demands.

Q8. **Why is it important to understand the relationship of the job to other jobs within the project?**

Answer

Should reflect but is not limited to: Vital to determine stakeholders to access to determine access to resources and scheduling of tasks to ensure the greater scheduled timeline is met and appropriate resources, including human resources, are available as needed for each job.

Q9. **How do you confirm that required resources are available to meet job requirements?**

Answer

Should reflect but is not limited to: Confirm suitable labour has been allocated to tasks and is competent to complete these using HR files for the job. Check contractors allocated to the work and confirm competencies in workplace contractors documents. Check resource registers to locate available plant, equipment and tools and ensure these are allocated to your job. Calculate material amounts required for areas and check procurement and delivery dockets to confirm materials required are those ordered/required and available or enroute for delivery to site.

Q10. **Two (2) labourers assigned to your team have called in sick and are unable to attend site as allocated. How would you respond?**

Answer

Should reflect but is not limited to: Make contact with HR to request two (2) workers be located to fill in; Ask for additional workers from a labour hire company; Begin the task with a reduced team but monitor the tasks for safety and time constraints until additional labourers arrive to the site and have been inducted and received pre-start information. Document HR changes in diary.

Q11. **Once your team members have arrived on-site, how do you confirm that they understand their roles and all requirements?**

Answer

Should reflect but is not limited to: conduct a pre-start meeting where all job requirements and methods are discussed and confirmed. Allow for questions and respond to each respectfully. Conduct a walk-through with the team to further clarify any questions or issues surrounding the job plan and the work tasks.

Q12. **What emergency response information should you be sure your team understands before undertaking work tasks?**

Answer

Should reflect but is not limited to: responsibilities should an incident occur, including who to contact, who the warden is, how to respond to an emergency alert via UHF, location of relevant fire extinguishers and first aid kits. evacuation routes and assembly area; emergency plan that deals with unexpected incidents, such as ground slip, flooding, gas leaks and the rescue of workers from an excavation.

Q13. **How do you encourage workers to adhere to work zone traffic management controls such as exclusion zones and traffic routes?**

Answer

Should reflect but is not limited to: explain the importance of keeping plant, equipment and people separate during company and site inductions, discuss site safety during pre-start including how to avoid incidents and accidents. Post signage and memos to collaborate instructions.

Q14. **How can you support sub-contractors to achieve their responsibilities?**

Answer

Should reflect but is not limited to: Supervisors have the goal of completing the work or the project as efficiently as possible, so it is in the company's interest to provide the subcontractors with all reasonable assistance. To do this, the supervisor should use good communication skills and show leadership in encouraging subcontractors to become part of the team. Assistance may include – inclusion to all meetings, training and information sessions related to the project. Supervisor should keep the sub-contractor appraised of progress and any variations and maintain open communication.

Q15. **How do supervisors determine human resources and sub-contractors needed for the job plan?**

Answer

Should reflect but is not limited to: Human Resources are determined by the size of the job and what tasks have to be done. As the job progresses, it is up to the Supervisor as to how many workers are needed. This is ascertained by mapping the work requirements and schedule against the workers attending. Towards the later part of the project, commence to decrease number of workers while remaining on schedule. If supervisor does not have enough resources, they will organise to sub-contract.

In cases where specific expertise is required and current work team does not demonstrate this expertise, tasks will be allocated to experienced sub-contractor.

Q16. **What is the relationship between various areas of civil work and how are these relationships relevant when developing job plans and work schedules?**

Answer

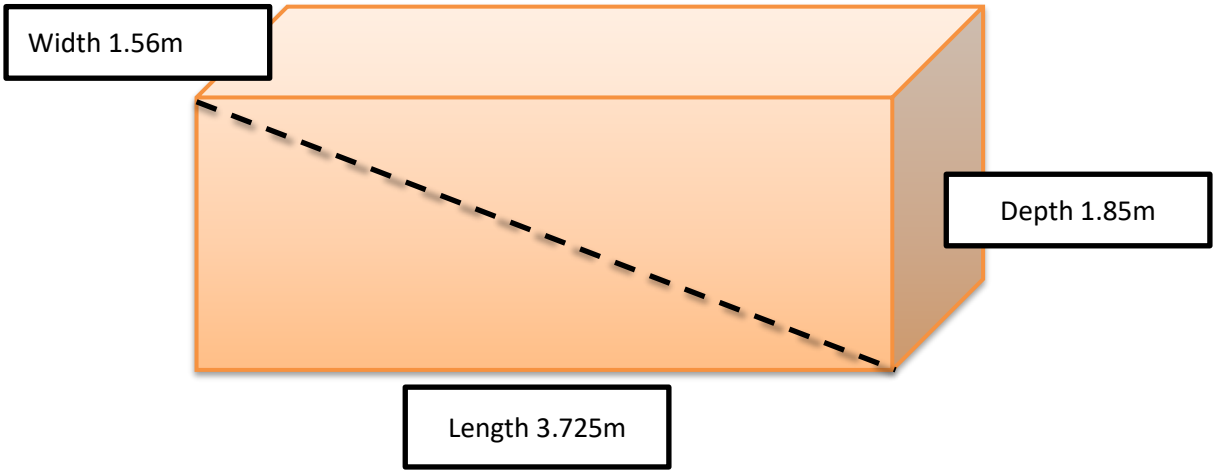
Should reflect but is not limited to discussion regarding: Understanding the relationship between civil work areas leads to appropriate sequencing of tasks and materials delivery and procurement. Limitations are applicable in situations where you cannot allocate your resources until after another team/crew have completed their tasks. Also requires communication when providing or collecting estimates of material, labour or plant used across various areas of the project.

Q17. **Elaborate on four (4) different types of estimates used when developing job plans.**

Answer

1. Should reflect but is not limited to discussion regarding four (4) of: Estimating Materials - from the estimate of a work it is possible to determine
2. what materials and in what quantities will be required for the work so that the arrangements to procure them can be made. Estimating Labour -the
3. number and kind of workers of different categories who will have to be employed to complete the work in the specified time can be found out from
4. the estimate. Estimating Plant - an estimate will help in determining amount and kind of equipment needed to complete the work. Estimating Time - the estimate of a work and the past experience enable one to estimate quite closely the length of time required to complete an item of work or the work as a whole. Estimating cost to determine whether the project or part is on budget or whether changes must be applied.

Refer to the following image and respond to Q18. Q19. and Q20.



Q18. **What is the total volume of the shape?**

Answer

V = L x W x D

3.725m x 1.56m x 1.85m

= 10.75035

Q19. **Calculate the surface area of the shape.**

Answer

A = L x W

3.725m x 1.56m

= 5.811m²

Q20. **Calculate the percent grade of the dotted line.**

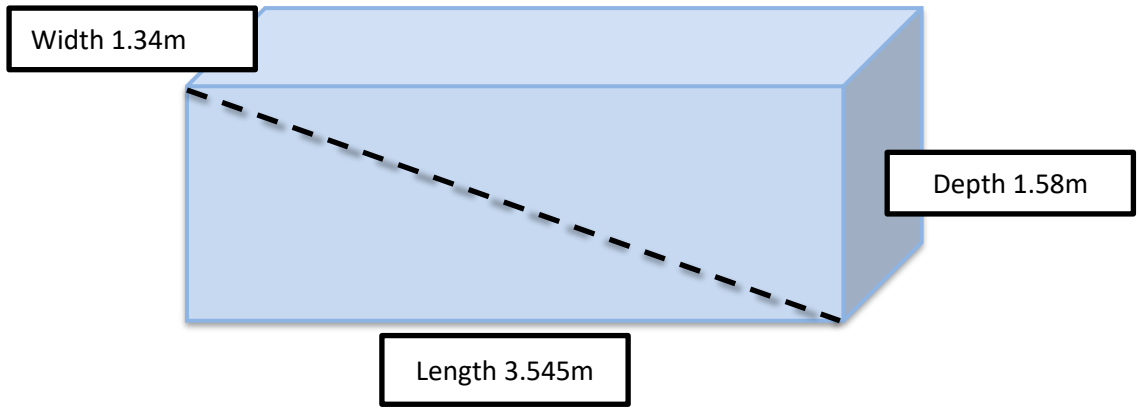
Answer

Rise ÷ Run x 100

1.850 ÷ 3.725 = 0.4966 x 100

= 49.66% grade

Refer to the following image and respond to Q21. and Q22.



Q21. **Calculate the volume of the shape.**

Answer

V = L x W x D

3.545m x 1.34m x 1.58m

= 7.505474 m²

Q22. **Calculate the grade of the dotted line as a percentage.**

Answer

Rise ÷ Run x 100

1.580 ÷ 3.545 = .4457 x 100

=44.57% grade

Q23. **You need an excavator for 3 days and have been asked to make sure there is enough diesel to last the whole 3 days.**

The excavator uses 15 litres per hour and will be operating for approximately 6 hours per day. The company buys its diesel at cost ($1.10 p/l) and it has a policy that requires all orders to include a contingency of 10%.

How much diesel will you need to order?

Answer

Usage p/hr x hrs. x days

15 x 6 x 3 = 270 Add 10%

270 + 27 = 297 == 297 litres

Q24. **Clearly explain the steps you undertake when setting out the site for a trench.**

Answer

Should reflect but is not limited to: Confirm site surface and benchmarks; Identify and protect existing underground services; Mark out using approved methods (spray paint, pegs and stringline). First locating the control line and from there identify the location, lengths, width and levels of trenches and the location and levels of any service crossings batters and offsets. Mark out to ensure excavating operators can follow.

Q25. **A hold point may be required following the set out. Why would this be necessary?**

Answer

Should reflect but is not limited to: To enable confirmation to be provided by project management/sponsor or client that set out is as required prior to any digging. This is a quality requirement as the hold point is a mandatory verification point beyond which a work process cannot proceed without authorisation by the contract administrator. Hold points are usually assigned to critical aspects of the work that cannot be inspected or corrected at a later stage.

Q26. **Write a description for each of the following trench collapse prevention methods (1) shoring, (2) benching (3) battering.**

Answer

1. Should reflect but is not limited to: A support system for trench faces used to prevent movement of soil. Shoring is used when location or depth of the cut makes sloping back to maximum allowable slope impractical.
2. Protecting from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.
3. To cut away the sides at 45 degrees, to reduce the risk of collapse

Q27. **Why is it important that the slope ratio not exceed the prescribed maximum value?**

Answer

Should reflect but is not limited to: dirt breaks away at 45°(angle of repose) so if the angle from the bottom to the top of the trench is less than 45° the trench is more likely to collapse.

Q28. **What does it mean, to monitor the excavation and installation process?**

Answer

Should reflect but is not limited to: Watching the excavation and installation work, constantly checking that activities are being performed as planned and within time constraints. Consistent measuring, confirming and documenting that requirements for area, grade, material have been met. Providing instruction to operators for achieving the requirements set out in the plans. Checking whether any elements of the project need to be adjusted and if so which ones and the impact any adjustments may have on the project including whether corrective actions will lead to the required results. Seeking approval for any corrective actions as required.

Q29. **What methods do you use to confirm the outcomes are being achieved according to the job requirements?**

Answer

Should reflect but is not limited to: Consistent measuring, confirming and documenting that requirements for area, grade, material have been met. Soil testing, depending on the situation and hold points. measuring and inspecting to meet the standards set out in the specifications, drawings, special provisions and job instructions.

Q30. **What is one (1) reason you may have to adjust the work practices and (2) what effect can this have on your work plan?**

Answer

1. Should reflect but is not limited to: bad weather; failures of plant to arrive on time; breakdowns of machinery or equipment; ill-health; industrial problems

2. May effect completion date, standard of work achieved, amount spent compared to budget. May result in the job being finished in a shorter or longer time than was scheduled, or at a higher or lower cost.

Q31. **How do you record the changes and adjustments made to work practices mentioned in Q30. ?**

Answer

Should reflect but is not limited to: recorded in-depth in daily diary and adjustments made to job plan.

Q32. **If you come across an unidentified existing service during excavation work, which methods or procedures would you use to identify the service?**

Answer

Should reflect but is not limited to information relating to: drawings first, existing services drawings, check with service engineer if applicable

colour of service pipe, pipe markings, location and depth.

Q33. **What is the BYDA system and how would you go about getting the information sent out to you and by what means?**

Answer

Should reflect but is not limited to: A National organisation that provides a free pre-excavation service via a website and app. You contact them and they will organise that member asset owners send you drawings of existing services in your nominated area.

Q34. **What are some characteristics, technical capabilities and limitations related to one (1) item of plant or equipment you should be monitoring during installation works?**

Answer

Should reflect but is not limited to: suitability of plant to the task, management of surrounding vehicular traffic and ground vibration; approach distances and appropriate control measures, zone of influence; Plant must be operated by a competent person; appropriate guards and operator protective devices must be fitted according to manufacturer guidelines, that the safe working load is displayed and any load measurement devices are operating correctly; maintained in accordance with the manufacturer/supplier's instructions or relevant Australian Standards. Other workers must be mindful of blind spots. Use of fuel and application suited to individual manufacturer requirements.

Q35. **How do you, as the supervisor, confirm plant, equipment and tools maintenance requirements are carried out and recorded according to job requirements and manufacturer specifications?**

Answer

Should reflect but is not limited to: confirming that operators and user adhere to site and organisational safety requirements and check plant and equipment logs and registers/check lists for compliance. Check logs and registers to confirm that all cleaning, maintenance and storage has been undertaken according to manufacturer and site requirements including logging of all issues and faults.

RIICPL401E
SUPERVISE THE INSTALLATION OF UNDERGROUND SERVICES USING OPEN EXCAVATION

PRACTICAL ASSESSMENT

Participant name	

FOR THE PARTICIPANT

Instructions

- The tasks outlined on the following pages will require performance in normal workplace activities, as a result of a structured activity set by an Observer in the workplace or a simulated activity set by your Assessor/Observer.
- The timeframe for these tasks will be established by your Assessor/Observer in consideration of location conditions and industry requirements.
- You must complete all tasks unassisted by the Assessor or other personnel unless the steps note this assistance.
- You must attempt all tasks (and itemised steps) for a 'Satisfactory' assessment outcome to be awarded.
    - For any observation conducted that is incomplete, or without satisfactory performance, the observation will need to be completed again after further training support.

FOR THE ASSESSOR/OBSERVER

Instructions

- The following observation record should be used to judge and record your observations of the Participant as they complete the task(s) set. You must record your observations of the Participant's performance.
    - For each occasion, indicate the task performed and whether it was a simulation or workplace-based task.
        - Any simulated assessment must ensure the Participant still performs under workplace conditions which reflect industry standards.
    - In the comments, provide clear detail regarding the task that the Participant was required to do (e.g. PPE used, materials handled, attachments connected, plant types).
- All steps must be satisfactorily demonstrated by the Participant for a 'Satisfactory' determination (indicated by an Assessor tick to the right of each itemised step, or an Observer tick to the right of each itemised step, and confirmation by an Assessor in the Assessor Comments).
    - Where you have determined that one or more task steps have not been satisfactorily demonstrated, provide the Participant with additional support and outline details of such assistance in the Assessor/Observer Comments. Allow the Participant two (2) further opportunities to demonstrate the task again to allow an opportunity for a 'Satisfactory' assessment outcome to be achieved.
    - If after three (3) attempts the Assessor determines that the Participant cannot demonstrate the required steps, a 'Not Satisfactory' outcome is to be determined.

TASK OUTCOME					
Task	**Date**	**Task Type (Tick)**	**Location**	**Task outcome (Tick)**	
				Satisfactory	Not Satisfactory
Task 1 (Occasion 1)		☐ Workplace ☐ Simulation		☐	☐
Task 1 (Occasion 2)		☐ Workplace ☐ Simulation		☐	☐

ASSESSOR COMMENTS: GENERAL
As necessary, outline: • Details on reattempts, alternative arrangements or reasonable adjustments made. • Where a Participant is deemed 'Not Satisfactory', provide recommendations for future training.

ASSESSOR COMMENTS: PRACTICAL TASK 1: OCCASION 1	
☐ Individual student (as named on cover page) ☐ Multiple students [☐ All from Attendance Report, ☐ Specific students involved – identify students]	
Task	**Provide detail**
1.1A.	Specify documents located, read and applied: e.g. Permit to excavate; BYDA; Asset owners drawings and plans; Road or other authority specifications; site geological and geotechnical data; site hydrological data; site engineering survey data; known and potential site hazards, constraints and conditions; site cultural and heritage information; task specifications; task drawings; sources of materials; other organisations and contractors involved in the task or related tasks; coordination, timing and budgeting requirements
1.1B.	Describe job to be undertaken: e.g. excavation and installation of underground services for xxxx application using open excavation located at xxxx address.
1.2J.	Specify what is set out for the tasks: e.g. control lines, cleared width, batters, off-sets
1.3D.	Specify where measurements are recorded: e.g. diary

ASSESSOR COMMENTS: PRACTICAL TASK 1: OCCASION 1	
1.3E.	Specify method of communication used with operators: e.g. UHF, signalling, marking on pegs
1.3F.	Specify adjustments made: e.g. not required
1.4A.	Specify reports submitted: e.g. daily; weekly reports as required
1.4C.	Specify recommended changes: e.g. recommendation put forward for change of supplier due to inferior material quality.

ASSESSOR COMMENTS: PRACTICAL TASK 1: OCCASION 2

☐ Individual student (as named on cover page)

☐ Multiple students [☐ All from Attendance Report, ☐ Specific students involved – identify students]

Task	Provide detail
1.1A.	Specify documents located, read and applied: e.g. Permit to excavate; BYDA; Asset owners drawings and plans; Road or other authority specifications; site geological and geotechnical data; site hydrological data; site engineering survey data; known and potential site hazards, constraints and conditions; site cultural and heritage information; task specifications; task drawings; sources of materials; other organisations and contractors involved in the task or related tasks; coordination, timing and budgeting requirements
1.1B.	Describe job to be undertaken: e.g. excavation and installation of underground services for xxxx application using open excavation located at xxxx address.
1.2J.	Specify what is set out for the tasks: e.g. control lines, cleared width, batters, off-sets
1.3D.	Specify where measurements are recorded: e.g. diary
1.3E.	Specify method of communication used with operators: e.g. UHF, signalling, marking on pegs

ASSESSOR COMMENTS: PRACTICAL TASK 1: OCCASION 2	
1.3F.	Specify adjustments made: e.g. added 1 day to schedule and moved all requirements on 1 day due to extreme weather conditions on day x.
1.4A.	Specify reports submitted: e.g. daily; weekly reports as required
1.4C.	Specify recommended changes: e.g. recommendation put forward for calibration of survey equipment.