

CPCCBC4018

APPLY SITE SURVEYS AND SET-OUT PROCEDURES TO BUILDING AND CONSTRUCTION PROJECTS

ASSESSMENT SUMMARY

The assessment activities for *CPCCBC4018 Apply site surveys and set-out procedures to building and construction projects* cover all aspects of the unit of competency. For Apprentices/Trainees, this includes supervisor completion of the Apprentice/Trainee Record (ATR).

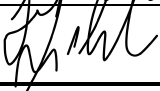
Participants must read all the information given before starting any assessment task. The assessment tasks are intended to be fair, flexible, valid and reliable. If a Participant has any questions or requires alternative arrangements to be made such requests should be directed to their Trainer/Assessor, who should note such arrangements in the 'Assessor Comments' on the affected assessment. If a Participant feels they are not yet ready to be assessed, they should discuss their options with their Trainer/Assessor.

To satisfactorily complete the assessment, the Participant is required to answer all questions correctly and demonstrate their skills to industry standards. If a Participant does not answer all questions or perform all tasks, they will be deemed 'Not Satisfactory' for the task and 'Not Yet Competent' for the unit of competency.

The Trainer/Assessor can provide the Participant with additional information on interpreting the assessment outcomes and guide the Participant's options. If a Participant is still deemed 'Not Satisfactory' they will have the opportunity to undertake a supplementary assessment or appeal the result as per the process in the Student Handbook.

By signing below, the Participant acknowledges:

- They understand the assessment instructions and requirements, and consent to being assessed.
- The work submitted is to be their own work – with the work of/with others needing to be clearly acknowledged and documented.
- They consent to any photo/video recording of their work that occurs during assessment.

Participant name	Jeremy Tydd
Participant signature	

Pre-requisite unit(s) to be achieved and authenticated prior to undertaking assessment

☒ Not applicable

Task	Date completed	Assessment Results	
Theory Exam		☐ Satisfactory	☐ Not Satisfactory
Workbook		☐ Satisfactory	☐ Not Satisfactory
Practical Assessment		☐ Satisfactory	☐ Not Satisfactory
Outcome for CPCCBC4018		☐ Competent	☐ Not Yet Competent

Evidence requirements checklist (ticked by assessor and evidence supplied to RTO)

- | | |
|---|--|
| ☐ Theory Exam
☐ Workbook | ☐ Practical Assessment
☐ Booking sheet
☐ Topographic contour plan from grid lines
☐ Calculations sheets |
|---|--|

Assessor name	
Assessor signature	

CPCCBC4018

APPLY SITE SURVEYS AND SET-OUT PROCEDURES TO BUILDING AND CONSTRUCTION PROJECTS

THEORY EXAM

Participant name	Jeremy Tydd
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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 responses 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. Explain why we should determine the orientation of the building according to the plans.

Answer The orientation of the building is often placed to suit the climatic features
and help the star rating of the building.



Q2. Discuss the information you can source from the specifications.

Answer

Products

Construction contracts

Specifications



Q3. The construction project must comply with the National Construction Code (NCC). What does this mean.

Answer

The design and products used in the build must comply with the NCC and the Australian standards.

☐

Q4. Describe the principles of establishing control during set-out surveys.

Answer

Control marks should be placed up on high ground as possible and are used as a referenced point when needed.

☐

Q5. What is linear measurement in surveying?

Answer It is the determination of the distance between two points

☐**Q6. Provide two (2) examples of surveying that uses linear measurements.**

Answer

1. Traverse

2. chain

☐**Q7. Listed below are principles of linear measurement for small surveys. Briefly explain what each principle means.**

Answer

Principle	Explanation
Working from whole to the part	Break the area down into triangles
Form well-conditioned triangles	Form angle between 30 and 120 degrees
Economy of lines	use sufficient check lines

☐

Q8. Listed below are two (2) methods of linear measurements. Briefly explain each.

Answer

Type of linear measurement	Explanation
Direct method	Measured on site
Optical method	Measured using the tacheometer



Q9. What is horizontal angular measurement in surveying?

Answer

The determination of the angle between two survey lines.



Q10. Why are the linear and angular measurements necessary in surveying?

Answer

The angular measurement determines the direction of the survey line.



Q11. Why is it relevant to have knowledge of geometry when conducting surveying activities?

Answer You must have an understanding of angles and math to ☐

understand what you are doing .

Q12. Why is it relevant to have knowledge of trigonometry when conducting surveying activities?

Answer It is often used to measure the height of angles of the land. ☐

Q13. What components are needed when using an optical level and how are these used?

Answer You will need a tripod with a telescope set level ☐

Q14. What is the difference between a dumpy level and a theodolite?

Answer Dumpys are only used for vetical as a theeodolite can be
used for both

☐

Q15. Describe a two-peg test.

Answer

☐

A two peg test is were you measure out a line and set you dumpy
up halfway and get meausurments

This tells you if you dumpy is right or needs adjustment.

Q16. Discuss benefits of using electronic distance measuring (EDM) equipment.

Answer EDM can measure azimuth and information can be downloaded ☐

Q17. Identify one operational and one functional feature for each of the levelling and surveying devices listed below.

Answer ☐

Device	Operational features	Levelling features
Laser level: manual-levelling laser	A manual user requires manual adjustment to get level	fits contours
Laser level: dot laser levels	Projects laser dots	Can project multiple lasers at the same time

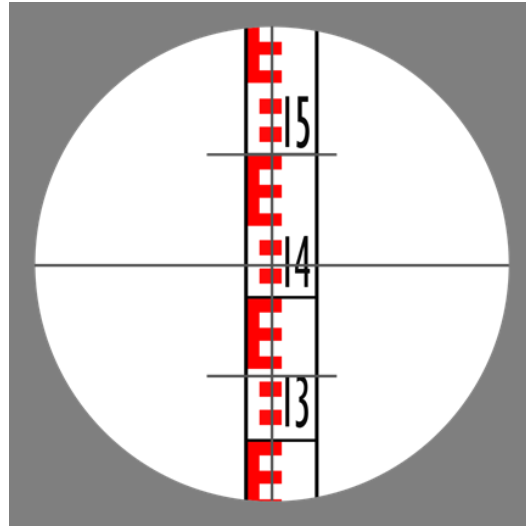
Q18. Describe features of the water level.

Answer The water level is one of the simplest types of level. Often you place water ☐
in a clear tube with both ends held up and where ever the water lands is level.

**Q19. You are responsible for checking levels in an excavation.
From the drawings for the job you know the floor level is RL 12.000. The
floor of the excavation is level (0% grade).**

**You find a peg, which identifies the RL as 14.50.
The plane of collimation measures 0.65m above the peg.
On what level would you set the receiver on the stake to achieve the
desired FL of the excavation? Show your calculations.**

Answer $14.500 + 0.650 = 15.150$ ☐
 $- 12.000 = 3.150 \text{ m}$



Q20. Using the picture above, what distance is the staff from the instrument?
Show workings.

Answer

$$1.500 - 1.345 \times 100$$

$$= 155 \times 100$$

$$= 15.500$$



Q21. Discuss errors in measured distances due to site characteristics and measurement methods.

Answer

Tripod not set up level

incorrect readings

environment



Q22. Discuss the purpose of setting out gridlines for the construction project.

Answer Plans should have gridlines that the surveyor can then set out there grid line to ☐

Q23. Discuss situations where you need to draw up a contour plan.

Answer Often used for slopping blocks

Q24. When do you draw longitudinal sections from RLs.

Answer to show the the reduced level at the change ☐

Q25. How do you determine the tolerances when determining levels and clearances from given grades for underground pipework?

Answer

AS/NZS 3500

☐

Q26. How do you calculate elevation slope as a decimal or a percentage?

Answer

rise over run

☐

Q27. How do you calculate elevation slope in degrees?

Answer

rise over run than tan to find theta

☐

btype text here

Type text here

bb

CPCBC4018

APPLY SITE SURVEYS AND SET-OUT PROCEDURES TO BUILDING AND CONSTRUCTION PROJECTS

WORKBOOK

Participant name	Jeremy Tydd
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FOR THE PARTICIPANT
Instructions
- You will complete written activities as outlined on the following pages. You must attempt all questions and provide enough detail in your responses to demonstrate your knowledge. - The timeframe for these tasks will be established by your Assessor or Training Plan, 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.

NOTE

At times, you will be provided with a specific context to which you must respond, otherwise it is anticipated that you will use a workplace of your choosing (your own, or hypothetical) to provide the context to the task.

At all times, the responses in your assessment must reference **Australian** (Queensland or Federal) documentation, including legislation, regulations, codes of practice, standards and guidance publications.

ACTIVITY 1

Access and review the working drawings and specifications contained in the project plan below:

[Case Study: Curtin, Australian Capital Territory](#)

Answer the following questions:

- What is the size of the land?
- What is the size of the house, excluding the garage and laundry?
- How many bedrooms does the house have on the ground floor?
- Based on the working drawings, in which cardinal direction is the terrace oriented?
- What was used to replace bricks that were removed?

a) What is the size of the land?

825m²

b) What is the size of the house, excluding the garage and laundry?

185m²

c) How many bedrooms does the house have on the ground floor?

2

d) Based on the working drawings, in which cardinal direction is the terrace oriented?

east

e) What was used to replace bricks that were removed?

timber weatherboards

**Satisfactory
Outcome**



ACTIVITY 2

Review the plans and elevations linked below and answer the questions that follow.

[YourHome Design For Place - 3BR + Study All plans and elevations](#)

For the purpose of this assessment, this case study scenario is based in your state/territory.

- What is the building classification for this project?
- In which volume of the NCC 2019 can you find the building codes and standards for this building classification?
- What climate zone is applicable to your work area according to the NCC? Specify your state/territory for your assessor's reference.
- List state/territory laws used in your state/territory as reference in determining the additions to these building codes.

a) What is the building classification for this project?

Class 1A

b) In which volume of the NCC 2019 can you find the building codes and standards for this building classification?

volume 2

c) What climate zone is applicable to your work area according to the NCC? Specify your state/territory for your assessor's reference.

Brisbane QLD Climate zone 2

d) List state/territory laws used in your state/territory as reference in determining the additions to these building codes.

Environmental planning and assessment act and regulation

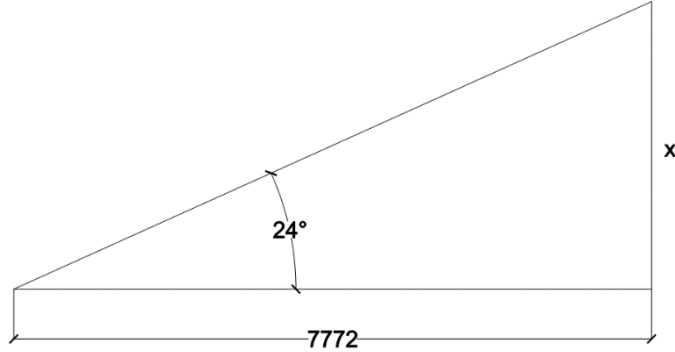
Satisfactory
Outcome



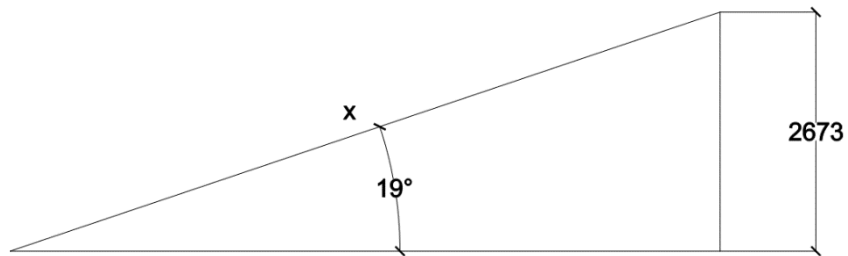
ACTIVITY 3

Determine the value of x in each of the following trigonometric problems. Calculators are permitted.

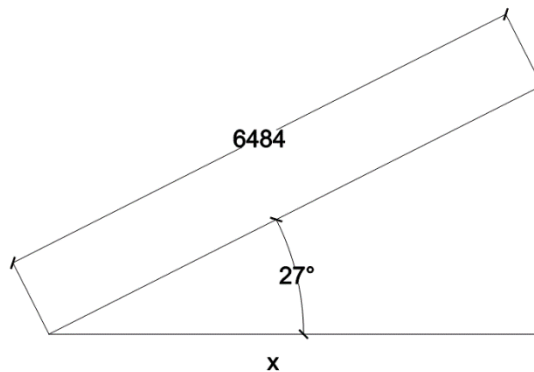
a) Answer: 3500



b) Answer: 8402



c) Answer: 5788



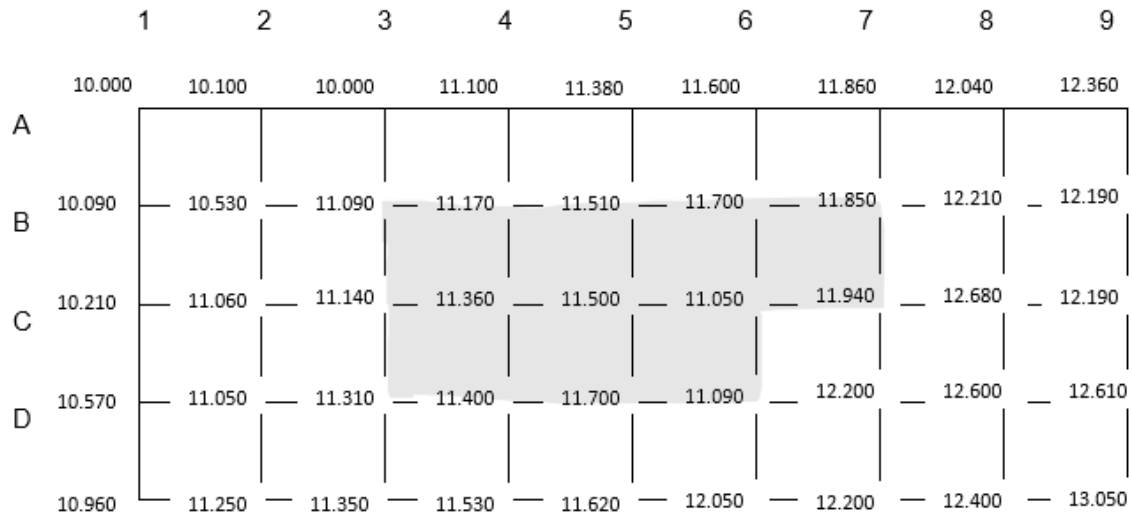
Satisfactory
Outcome



Page left blank for working out and calculations

ACTIVITY 4

- a) Using the grid pattern below, complete the table to calculate how much soil is needed to be removed from the highlighted section of the grid (*represents the intended building*) to a given RL of 11.000. Grid measurements = 5m x 5m. (*first row has been completed for you*)
- b) Suggest a new RL for the site that will require no spoil removal, only cut and fill.



Volume of excavation- Grid method		Formation level RL	RL =11.000
Ground level	Corner Height "H"	No. of Squares occurring "N"	Product H & N
B3	11.009 -11.000 = 0.090	1	0.090
B4	11.170-.000=0.170	2	0.340
B5	11.510-11.000=0.510	2	1.020
B6	11.700- 11.000=0.700	2	1.400
B7	11.850- 11.000=0.850	1	0.850
C3		2	0.280
C4		4	1.440
C5		4	2.000
C6		3	2.550
C7		1	0.940
D3		1	0.310
D4		2	0.800
D5		2	1.400
D6		1	0.890
		28	14.310
Volume =	Grid x Grid x Total Product ÷ 4		
			11.511
	89.438		

a) Calculate how much soil is needed to be removed from the highlighted section of the grid (represents the intended building) to a given RL of 11.000. Original grid measurements = 5m x 5m.

90M3

b) Suggest a new RL for the site that will require no spoil removal, only cut and fill.

11.511

Satisfactory
Outcome



CPCCBBC4018

APPLY SITE SURVEYS AND SET-OUT PROCEDURES TO BUILDING AND CONSTRUCTION PROJECTS

PRACTICAL ASSESSMENT

Participant name	Jeremy Tydd
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FOR THE PARTICIPANT
Instructions
• The tasks outlined on the following pages will require performance of 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		☐	☐

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 how participant identified current plans:
1.1B.	Specify(✓) surveying device collected and operated: ☐ Electronic distance measuring (EDM) equipment ☐ Laser level: manual-levelling laser ☐ Laser level: dot laser level ☐ Optical (Dumpy) level ☐ Water level ☐ Theodolite ☐ Other (please specify):
1.1B.	Specify(✓) levelling device collected and operated: ☐ Electronic distance measuring (EDM) equipment ☐ Laser level: manual-levelling laser ☐ Laser level: dot laser level ☐ Optical (Dumpy) level ☐ Water level ☐ Theodolite ☐ Other (please specify):
1.1D. 1.1E. 1.1F.	Specify site RL calculations were made:
1.1G.	Specify errors explained due to site characteristics:
1.1H.	Specify(✓) digital tools operated to communicate with others: ☐ Mobile phone ☐ UHF/ 2-way ☐ PC via intranet ☐ PC or mobile for email ☐ Other (please specify):
1.3A. 1.3B. 1.3C. 1.3D. 1.3E.	Specify drainage and pipeline situations where calculations were made to determine grades.

CPCCBC4018

APPLY SITE SURVEYS AND SET-OUT PROCEDURES TO BUILDING AND CONSTRUCTION PROJECTS

Practical Task 1

Description of task:

This assessment applies to National Construction Code (NCC) classifications:

- Residential - Class 1 and 10 buildings, maximum two storeys
- Commercial - Class 2 to 9, Type C only constructions

The participant must demonstrate the skills and knowledge to correctly apply site surveys and set-out procedures to a residential or commercial building on site. Demonstration must include:

- Prepare for and conduct site set-out.
 - Locate, read and adhere to the current plans and site set-out procedures.
 - Select and operate one surveying and one levelling device in accordance with SOPs (*copy of booking sheet required as evidence*).
 - Check accuracy of instrument by conducting a 'two peg test'.
 - Carry out reduction in a closed level run by rise and fall method (*copy of booking sheet required as evidence*).
 - Carry out reduction in a closed level run by height of plane collimation (HPC) method (*copy of booking sheet required as evidence*).
 - Calculate accurate staff readings to enable a specific reduced level (RL) set-out.
 - Identify and explain errors in measured distances due to site characteristics and measurement methods.
 - Use digital tools to communicate with others.
- Develop a contour grid.
 - Determine set-out grid and levels.
 - Prepare a topographic contour plan from grid levels to specified tolerances and stated contour intervals (*copy required as evidence*).
 - Determine surface area being levelled and calculate cut and fill volumes.
 - Calculate and record trigonometric and geometric calculations commonly used with grid lines, off sets and right-angle triangles without error (*copy of calculations required as evidence*).
 - Calculate cut and fill quantities including: (*copy of calculations required as evidence*).
 - area and volume of land to be levelled.
 - area of land to be filled.
 - volume of fill required.
- Determine grades and levels
 - Draw longitudinal sections from RLs.
 - Determine levels and clearances from given grades and distances to specified tolerances.
 - Express calculation angles, percentages and run ratios in grades.
 - Determine calculations for batter levels from grades and distances.
 - Construct longitudinal sections and determine associated grades and levels in typical drainage and pipeline situations.

These tasks may be simulated or real. The Participant is to gather evidence of how they have completed each component of the Practical Task, which is to be submitted with this Practical Assessment sheet. The Observer is to provide detailed comments on the tasks completed by the Participant (on the Observer Comments, overleaf). The Assessor is to verify the Observer's comments, noting their findings in the Assessor Comments (on the back of the Practical Assessment cover page) and provide the assessment outcome.

Resources required:

Work site, plans, procedures, one surveying device, one levelling device, access to computer and software, booking sheet, grid paper, pencil, calculator, communication equipment.

Practical Task 1	
Observer details	
Name of observer:	Ayden Cooper
Role of observer (Confirm suitability to sign)	Supervisor
Email address of observer	admin@cooperconstructionandrenavation.com
Signature of observer:	
Date:	15-4-25

When completing the task, did the Participant:	Tick if satisfactorily completed. Provide comments if left unticked.
1 Prepare for and conduct site set-out.	
1.1A. Locate, read and adhere to the current plans and site set-out procedures.	✓
1.1B. Select and operate one surveying and one levelling device in accordance with SOPs (<i>copy of booking sheet required as evidence</i>).	✓
1.1C. Check accuracy of instrument by conducting a 'two peg test'.	✓
1.1D. Carry out reduction in a closed level run by rise and fall method (<i>copy of booking sheet required as evidence</i>).	✓
1.1E. Carry out reduction in a closed level run by height of plane collimation (HPC) method (<i>copy of booking sheet required as evidence</i>).	✓
1.1F. Calculate accurate staff readings to enable a specific reduced level (RL) set-out.	✓
1.1G. Identify and explain errors in measured distances due to site characteristics and measurement methods.	✓
1.1H. Use digital tools to communicate with others.	✓
1.1I. Use equipment software to collect information and develop relevant documentation.	
2 Develop a contour grid.	
1.2A. Determine set-out grid and levels.	✓
1.2B. Prepare a topographic contour plan from grid levels to specified tolerances and stated contour intervals (<i>copy required as evidence</i>).	✓
1.2C. Determine surface area being levelled and calculate cut and fill volumes.	
1.2D. Calculate and record trigonometric and geometric calculations commonly used with grid lines, off sets and right-angle triangles without error (<i>copy of calculations required as evidence</i>).	✓
1.2E. Calculate cut and fill quantities including: (<i>copy of calculations required as evidence</i>). - area and volume of land to be levelled. - area of land to be filled and volume of fill required.	✓
3 Determine grades and levels.	
1.3A. Draw longitudinal sections from RLs.	✓
1.3B. Determine levels and clearances from given grades and distances to specified tolerances.	✓
1.3C. Express calculation angles, percentages and run ratios in grades (<i>copy of calculations required as evidence</i>).	✓
1.3D. Determine calculations for batter levels from grades and distances (<i>copy of calculations required as evidence</i>).	✓
1.3E. Construct longitudinal sections and determine associated grades and levels in typical drainage and pipeline situations.	✓

Observer comments: