



Cambridge International AS & A Level

INFORMATION TECHNOLOGY

9626/02

Paper 2 Practical

May/June 2021

2 hours 30 minutes

You will need: Candidate source files (listed on page 2)

INSTRUCTIONS

- Carry out **every** instruction in **each** task.
- Save your work using the file names given in the task as and when instructed.
- You must **not** have access to the internet or any email system during this examination.
- You must save your work in the correct file format as stated in the tasks. If you save work in an incorrect file format, you will **not** receive marks for that task.

INFORMATION

- The total mark for this paper is 110.
- The number of marks for each task or part task is shown in brackets [].

This document has **4** pages.

You have been supplied with the following source files:

j21ccc.csv
j21music.mp3
j21voice.mp3

You work for Christine's Construction Company and will develop a spreadsheet to plan foundations for walls and buildings.

You must use the most efficient method to solve each task. All documents produced must be of a professional standard and suit the business context.

All currency values must be in dollars with 2 decimal places.

- 1 Open and examine the file **j21ccc.csv** in a spreadsheet. Edit and format the spreadsheet so it looks like this:

	A	B	C	D	E	F	G	H	I	J	K	L
1	Christine's Construction Company											
2												
3	Building foundation planner for brick/block walls				Soil/Rock data			Dry	Wet	Dry	Wet	kg/m2
4												
5	Data entry		Enter all dimensions in metres		Soil code	Soil/Rock type		Width	Width	Depth	Depth	Load bearing
6	Building weighting factor	1.36						in mm	in mm	in mm	in mm	pressure
7	Type of construction:		Enter W (freestanding Wall) or B (building)									
8	Length of wall:		Enter length in metres	L	Limestone	Strip/trench fill	600	600	500	600	30000	
9	Height of wall:		Enter height in metres	G	Granite	Strip/trench fill	600	600	200	200	59000	
10	Code for the type of soil:		Enter soil code: C,G,H,J,L,P,S,T,U,V or W	S	Sandstone	Strip/trench fill	600	600	500	500	30000	
11	Thickness of wall:		Enter S (single) or D (double)	T	Shale	Strip/trench fill	600	600	500	500	27000	
12	Soil moisture level:		Enter W (wet) or D (dry)	V	Firm chalk	Strip/trench fill	450	450	700	700	30000	
13				W	Soft chalk	Unsuitable						
14	Foundations:			J	Gravel	Strip/trench fill	450	900	700	800	25000	
15	Depth:	metres		H	Gravel and sand	Strip/trench fill	450	900	700	700	20000	
16	Width:	metres		C	Clay	Strip/trench fill	700	1000	1000	3000	10000	
17	Length:	metres		P	Peat	Raft foundation only						
18	The volume of foundations will be:	cubic metres		U	Sand	Strip/trench fill	600	600	800	700	15000	
19	The volume of concrete will be:	cubic metres										
20	Weight of the wall will be:	kilograms										
21					Costs per cubic metre							
22	The concrete for the foundations will cost:				Concrete:	\$85.30						
					Empty portion:	\$22.00						

Cells A1 to C1 and A3 to C3 are merged, have an orange background and have black text. The text in row 1 is 28 points high. The text in the merged cell in row 3 is 18 points high.

Centre align cells B6 to B20.

Insert on the left in the footer the text **Created at** followed by a space, then the time, then a space, the text **on**, a space, followed by the date.

Insert on the right in the footer an automated filename with the file path.

Save your spreadsheet as **ccc1_** followed by your centre number_candidate number

e.g. ccc1_ZZ999_9999

[15]

- 2 Enter a formula in cell C14 to display a blank cell if the soil type is **not** *Soft chalk* or *Peat*, or to display the text

Strip foundations are not suitable for this site

if the soil type is *Soft chalk* or *Peat*.

If cell C14 is **not** displayed as blank, format the cell to have a red background with centre aligned, bold white text.

[9]

- 3 Enter formulae in cells B15 to B19 to display a blank cell, rather than a value, if strip foundations are not suitable for a site. The formula in cell:

- B15 must calculate the depth of the foundation, in metres, using the soil code and soil moisture level (entered by the user in column B). To convert from millimetres (mm) to metres (m) you divide by 1000.
- B16 must calculate the width of the foundation, in metres, using the soil code and soil moisture level (entered by the user in column B).
- B17 must display the length of the foundation in metres.
- B18 must calculate the volume of the foundation. The volume of the foundation is calculated as: foundation depth $\times$ foundation width $\times$ foundation length.
- B19 must calculate the volume of concrete required. This must be the volume of the foundation plus an extra 7% to allow for spillage, rounded up to 2 decimal places. [22]

If the thickness of the wall is a single brick, its weight is calculated as:

Length of wall $\times$ Height of wall $\times$ Number of bricks per square metre $\times$ Weight of a single brick.

If the thickness of the wall is a double brick, its weight is calculated as twice the weight of a single wall.

If the structure is going to be a building rather than a wall, its weight will be increased by a further 50%.

- 4 Enter a formula in cell B20 to calculate the weight of the wall. Each brick weighs 3.5 kilograms and there are 55 bricks per square metre. These figures are **not** variables and will **not** change. [7]

- 5 The pressure exerted by a wall on the soil is calculated as:

Weight of wall $\div$ Length of wall.

Enter a formula in cell A21 to display a blank cell if the pressure exerted by the wall is less than the *Load bearing pressure* for this soil type, or to display the text

Exceeds the foundation's load bearing

if the pressure exerted by the wall exceeds or is equal to the *Load bearing pressure* for this soil type.

Replicate the conditional formatting placed in cell C14 so it also applies to this cell. [7]

Concrete is delivered in lorries carrying 6 cubic metres. Each lorry can be full or partially full. If it is partially full a cost for the empty portion is added to the cost of the concrete. This formula is used to calculate the delivered cost of concrete for the foundations.

The volume of concrete $\times$ the cost per cubic metre + the volume of empty space in the lorry $\times$ the cost for the empty portion.

- 6 Enter a formula in cell B22 to calculate the cost of the concrete for the foundations.

Display a blank cell, rather than the cost of the concrete, if strip foundations are not suitable for this site. [11]

- 7 Apply appropriate formatting to cells containing currency values. [1]

- 8 Apply appropriate validation rules to your spreadsheet.

Save your spreadsheet.

[11]

- 9 Protect all cells in:

- columns A and C
- row 6
- the range B15 to B22

so that they cannot be edited when the worksheet is locked. Leave all other cells unprotected. Protect the worksheet but not the workbook, using the password **CCC**

Save your spreadsheet as **j21ccc2_** followed by your centre number_candidate number

e.g. ccc2_ZZ999_9999

[5]

- 10 Use your spreadsheet to model potential building sites. For each site, export the contents of A1 to C22 only, in **portable document format (pdf)** with the filename set as the question number and part number, followed by your centre number_candidate number

e.g. 10a_ZZ999_9999

The sites are:

- a. A single thickness wall, 4 metres in length, 1.5 metres in height, built on dry soft chalk
- b. A double thickness wall, 4 metres in length, 5 metres in height, built on dry gravel
- c. A building with double thickness walls, 28 metres in length and 5.2 metres in height, built on wet gravel
- d. A building with double thickness walls, 30 metres in length and 50 metres in height, built on wet sand.

[15]

You will edit a short audio clip that will be used as part of an advertising campaign.

- 11 Open the file **j21music.mp3** in an audio editing package. Change the speed of the clip ×2.

Add the file **j21voice.mp3** so that it plays alongside the first track and starts after 2 seconds.

Merge the tracks so that the finished soundtrack is monophonic. Remove the end of the track so that it becomes 29.5 seconds long.

Export the file in **.mp3 format** as **CCCsound_** followed by your centre number_candidate number

e.g. CCCsound_ZZ999_9999

Export the file with the same filename in **.ogg format**.

[7]

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