

Name



Adopt a School
Speller Metcalfe



About Speller Metcalfe

Speller Metcalfe is a locally based construction company, founded in 1995 by Steve Speller and Andy Metcalfe. Since then we have grown significantly and are now proud to be at the forefront of innovation within the industry, with over 200 employees across a range of managerial, technical and site based roles.

We operate on a national scale with offices in Malvern, Gloucester, Wolverhampton and London, managing construction projects from £1M up to £30M, across the following sectors;

- Automotive
- Commercial and industrial
- Education
- Emergency services
- Healthcare
- Heritage
- Hospitality
- Residential
- Retail
- Sports & Leisure

Our key company values:

- Forward-thinking
- Collaborative
- Sustainable
- Considerate
- Trustworthy

At Speller Metcalfe, we are proud of our family roots and as such we maintain a family, team based ethos in everything we do and we believe it is one of the reasons we are where we are today.

Roles in Construction

The construction industry is one of the largest and most diverse industries in the UK, with over 2.5 million people currently working in construction – that means 1 in 10 jobs are in construction!

The variety of jobs available is huge and always evolving, whether you want to be based in an office or on different sites there is a role to suit everyone;

- Human Resources
- Information Technology
- Environmental / Sustainability
- Health & Safety
- Commercial
- Surveying
- Project Management
- Procurement
- Site Management
- Design Management
- Estimating
- Business Development
- PR & Marketing
- Building Information Modelling (BIM)

Working in construction, you can make a real difference to the environment in which we live in by creating, designing and constructing buildings which will be a part of communities for decades. Whether it be creating places to live, places to learn, places to shop and places to work – construction is a major player in the UK and global economy.



What is the Maths in Construction project?

We have developed bespoke Maths in Construction lessons for you to complete. These lessons are designed to illustrate how maths is used within the industry, specifically in some of the jobs roles at Speller Metcalfe. Hopefully this will show you that what you learn in the classroom can be transferred to your chosen career. We hope you find the lessons fun and something different to your usual lessons. You will be using real life projects to bring your calculations to life.

Lesson 1:

- Understanding the role of an Estimator
- Understanding different values of construction

Lesson 2:

- Calculating excavation volumes
- Calculating volumes to create a new floor level
- Understanding how the cost of a construction activity is calculated

Key definitions:

Tender	An offer submitted by a contractor to undertake the works for a set price.
Value	The value of construction works on site during a given period.
Estimator	The person who works out the probable costs and fixes the estimate.
Plan	Drawing that depicts the view if the person was to look down on an object or building.
Scale	The ratio between a model or drawing, and the actual building or structure that it represents.
Elevation	A two dimensional drawing of the side of a building or object.
Volume	The space that a material or area occupies, measured in cubic meters m ³ .
Excavation	The process of digging holes in the ground.
Cost plan	The breakdown of items of work and their associated costs.
Overheads	The operating costs of a company e.g. cost of offices, administration, management costs.
Profit	The money a project/company makes after deducting all costs and expenses.
Preliminaries	The costs associated with administering a project and providing plant, site staff, welfare facilities etc.
Subcontractor	A company or person who carries our work for a company as part of a larger project.
Concrete Floor Slab	A common structural element of modern buildings. In many domestic and industrial buildings, a thick concrete slab, supported on foundations or directly on the subsoil, is used to construct the ground floor of a building.
Hard-core	The term used to describe the mass of solid, not easily degraded materials of low absorbency that is employed in creating a base for heavy load-bearing stone and concrete floors.
Damp Proof Membranes	A membrane material applied to prevent moisture transmission. A common example is polyethylene sheeting laid under a concrete slab to prevent the concrete from gaining moisture through capillary action.
Scaled Drawings	It would be impractical to draw them to full size, therefore the true measurements are reduced to a ratio of the real item.



Lesson 1

Exercise 1:

Task: From your online reasearch, please brainstorm what you think the role of an Estimator is in the construction industry and why they are important when constructing a building?

To help you with your research, visit www.goconstruct.org

Lesson 2

Reduced Level Excavation (Volume Calculations in Construction)

Buildings sit on foundations that are typically built below ground level. On most construction projects it is necessary to carry out a reduced level excavation. This means removing soil in order to change the levels of the existing land and create a level platform to build on. It is important that the volume of soil that needs to be removed is calculated with accuracy. The excavation will then need to be filled up with construction materials such as hard core and concrete to provide a level solid ground floor. It is important that the volume of construction material used to refill the excavation to create the floor slab is calculated with accuracy.

Main Activity

Speller Metcalfe needs your assistance.

The estimating department are pricing a project with a concrete floor slab. They have asked you to assist by;

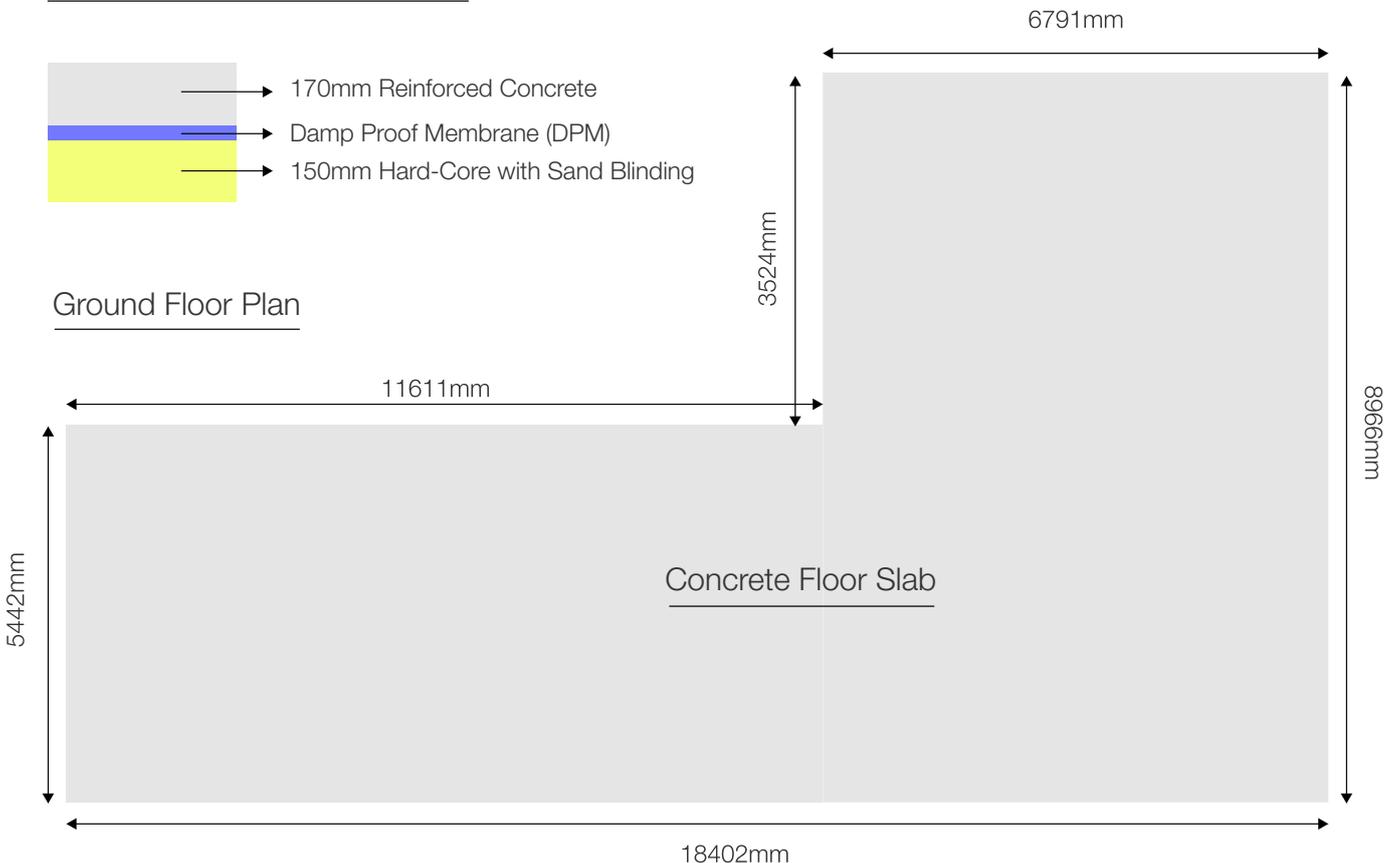
1. Working out the estimated costs of excavation and removing unwanted ground material.
2. Working out estimated costs for the concrete floor slab materials.

This will form part of a cost plan of the whole project.

Ground Floor Material Make Up



Ground Floor Plan





Lesson 2 continued

Part 1

Speller Metcalfe have calculated that there will be around 350m³ of unwanted material to be removed from site. It will cost roughly £25.50 per m³ to be removed.

How much is the total estimated cost to remove unwanted excavated material form site?

Part 2

Speller Metcalfe need you to work out estimated costs for the concrete floor slab. To do this you are required to work out roughly the amount of materials required for the floor slab and then calculate the total cost of all materials. Using the information provided, please complete the table below.

Construction Material	Quantity	Unit
Concrete		m ³
Damp Proof Membrane	124	m ²
Hardcore		m ³

Cost Per Unit		Total
£77.26	m ³	£
£2.35	m ²	£
£12.53	m ³	£
Grand Total:		£

Extension Exercise

Material rates have increased since you carried out your cost analysis, please update your cost plan as per the increased rates.

- Concrete - 10% Price Increase
- Damp Proof Membrane – No Increase
- Hard-core – 7% Price Increase

Please write your answer in the table below;

Material	Quantity	Unit	New Cost Per Unit	Total
Concrete		m ³	£	£
Damp Proof Membrane		m ²	£	£
Hard-core		m ³	£	£
Revised Grand Total:				£