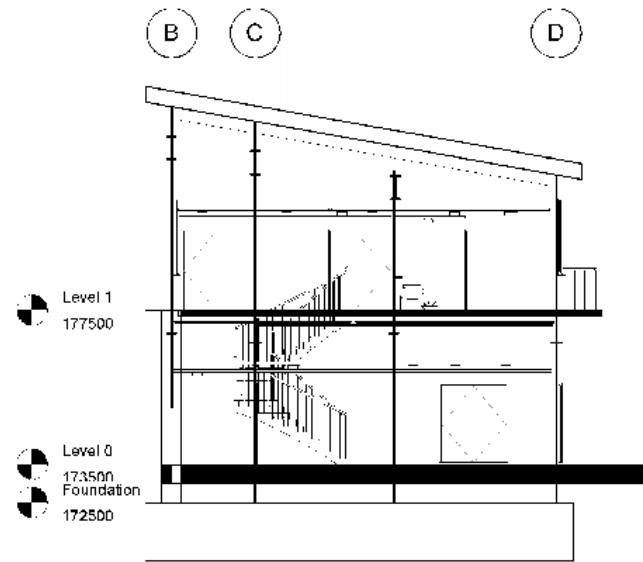
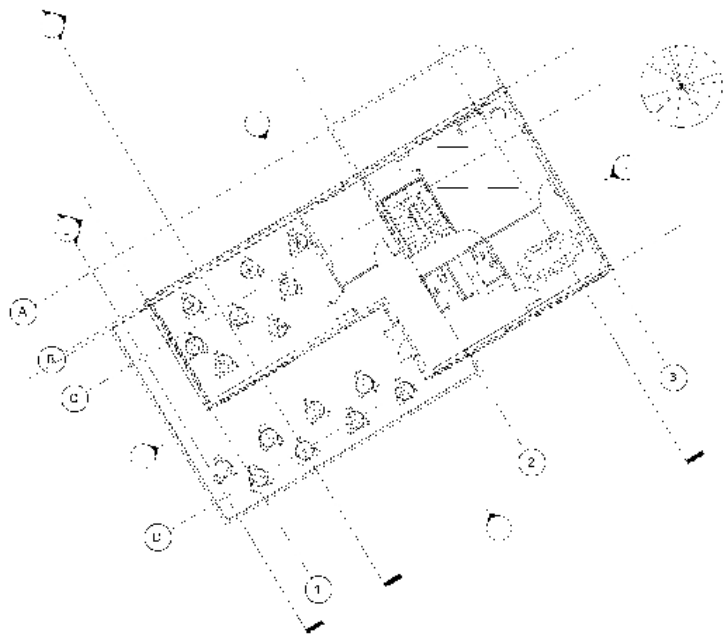


Designing, Engineering and Constructing a Sustainable Built Environment



Understanding sustainability and sustainable design

Aesthetic considerations

Working with clients and community cohesion

Building information modelling skills

Architectural skills in schematic and design development

Building services engineering

Energy efficiency and post occupancy behaviour

Land surveying and site engineering

Landscape design

Planning constraints

Facilities management

Sustainable procurement and resource efficiency

Applied construction mathematics

**design...
engineer...
construct!®**

EDUCATING
THE FUTURE OF
CONSTRUCTION



Entry requirements

Grade B in Level 2 DEC or another DT qualification
Grade B in Maths

Lessons

You will have 5 hrs of DEC a week, 3 hours on a Thursday and then 2 hours on Monday. Lessons will take place in either A5 or A10 and will be taken by Miss Vardy.

Lessons will vary, sometimes you will be researching, other times you will be computer modelling and there will be other activities such as role play, sketching, presenting and listening to visiting experts.

Visits

To enable you to produce an informed design we will need to go on site visits and visits to existing buildings in order to understand how things work.

We will also visit both Sheffield Universities during the course which will be an excellent opportunity to find out more about the courses available to you later on.

**Sheffield
Hallam
University**



The
University
Of
Sheffield.

Self Study

You are expected to spend a minimum of 5 hours per week studying outside lessons.

This could include completing assignments, improving your REVIT skills, researching buildings and materials or summarising the work from lessons to support you in your examination.

Working with Industry



We have two industry sponsors to help us with our projects. Their engineers, surveyors and architects will come in and help you with your projects and give you their professional opinion of your work as it progresses.

We may go and visit them and see what they do, there is also the possibility of organising work experience.

Assignments

You will be set regular deadlines relating to the different aspects of your project. The coursework element is pass/fail and it is essential that you keep up to date.

All resources will be posted on Edmodo, an online course package. Your marks and feedback will be made available to you via the site.



Equipment

We will provide you with a sketch book for taking notes in lessons. You will need to bring a pen, pencil and ruler.

As most of the work on the course is digital you will need access to a computer with Microsoft office and access to the internet. If you do not have this at home we will make these facilities available to you at lunchtimes and after school.

Level 3 Designing, Engineering and Constructing a Sustainable Built Environment: Course Content

Unit 1: Defining a Sustainable Construction Project 10 credits (60 GLH)	Unit 2: Developing a Sustainable Construction Project 10 credits (60 GLH)	Unit 3: Investigate design, structural and services aspects of a sustainable construction project 10 credits (60 GLH)	Unit 4: Deliver design, structural and services aspects of a sustainable construction project 10 credits (60 GLH) Uni	Unit 5: Lifecycle and Financial Planning for a Sustainable Construction Project 10 credits (60 GLH)	Unit 6: Evaluating and Documenting a Sustainable Construction Project 10 credits (60 GLH)
1. Be able to research and convey the project remit.	1. Be able to prepare a design brief and take steps to appoint an effective design team.	1. Use building information modelling techniques to develop the design	1. Use building information modelling techniques to develop the design.	1. Use building information modelling techniques to support the operational management of a building.	1. Make objective comparisons between construction methods
2. Be able to set standards for sustainability in a construction project.	2. Be able to use building information modelling techniques for concept design.	2. Gather and analyse information to develop the structural elements.	2. Use building information modelling techniques to develop structural elements of a building project.	2. Understand cost analysis and financial control.	2. Communicate outcomes from professional perspectives.
3. Be able to define site information required at predesign phase.	3. Be able to prepare information and resources needed to support a planning application.	3. Gather and analyse information to develop the building services elements.	3. Use building information modelling techniques to develop building services elements of a building project.	3. Produce a budget for a complex building project.	3. Make a presentation of a summary report to a critical audience.

DEC Summer Assignment

You are going to design and model café for Hillsborough Park that takes account of social distancing and offers indoor and outdoor seating and a takeaway service. You will be given a site and then it's up to you...

Location

Use google maps to find the location: Hillsborough Park
Parkside Rd, Sheffield S6 2AB.
Include a map that shows the location in terms of infrastructure (roads, footpaths, existing buildings)

Stakeholders

Who are your stakeholders?

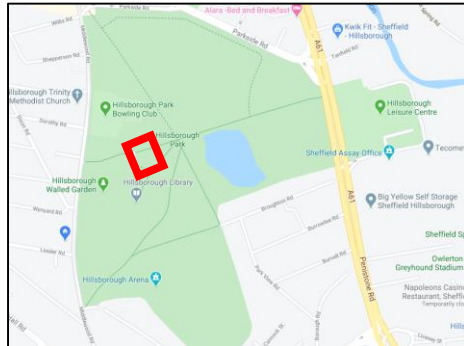
Consider:

- Who will be the client?
- Who will use the building?
- Who will be affected by the building?

Include images of these people or groups of people and think about what they would want from the building

Precedents

Explore precedents to inspire your ideas. These could be of buildings of that type, for example other cafes both in the UK and abroad.



You should produce a PowerPoint presentation or a written report of about 4-6 slides/pages showing what you have found out and at least 2 different ideas for a building (floor plans and 3D sketch or model).

Project Timeline

Gather

Location

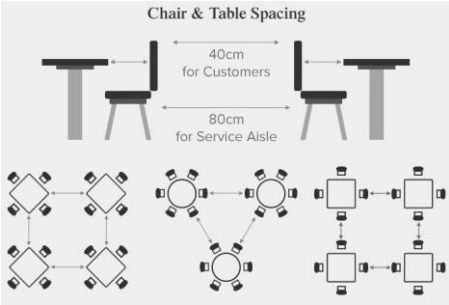
Where is the site?
What access is there?

Stakeholders

Who will use the building?
Who will work there?
What spaces will they need?

Precedents

What does a café look like?
What materials are used?



Analyse

Site

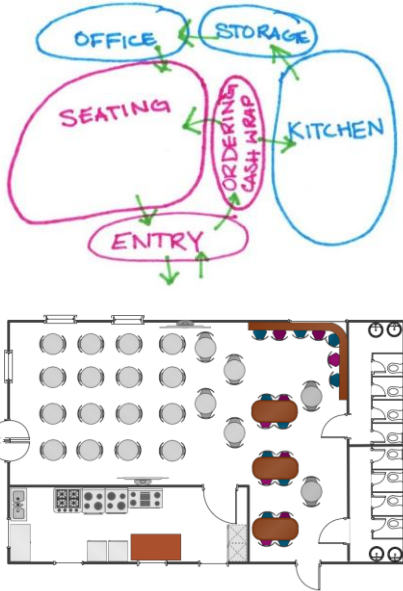
How big is the site?

Spaces

What spaces/rooms do I need?
How big they need to be?
How will they connect?

Materials

What materials should I use?



Generate

Bubble Diagram

How should the spaces be arranged?

Floor Plan

How big are the spaces?
What scale?
Where are the windows and doors?

Ideas

What do you want it to look like?
What shape will the roof be?



Realise

Model

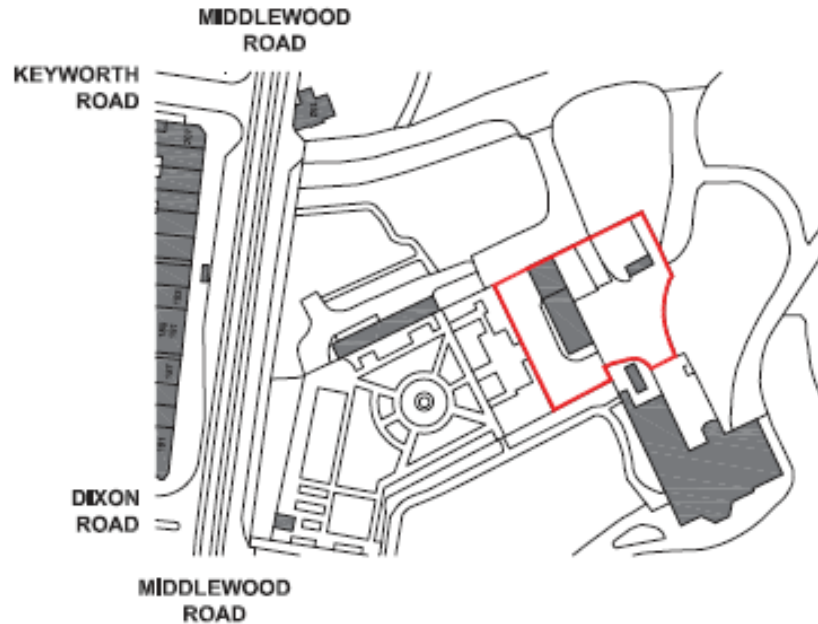
Create a card model using your floor plan for sizes.

Digital Model

Use 3D software to create a digital model.



Design Data



The PDF you have been given is a scale map of the site. The site boundary is shown in red. The scale is 1:1250.

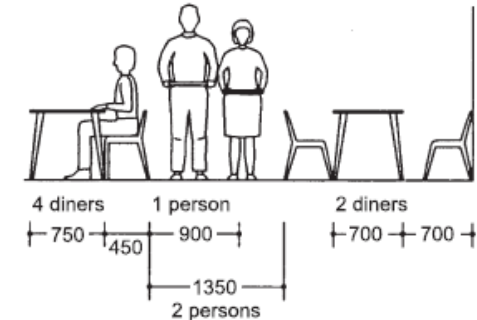
Print off a copy of the map and calculate the width and length of the site.

- Width in mm x 1.250 = m
- Length in mm x 1.250 = m

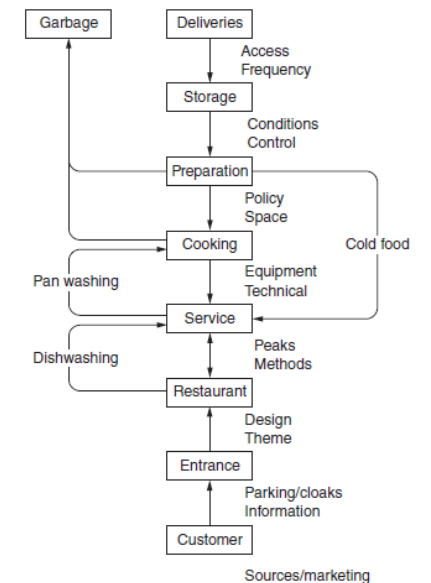
There is a 2 storey building on the site width 8m, length 20m, height 6m this will be demolished and your building should fit on the existing footprint.

number of seats		table size: drinking mm	table size: eating mm
1		450 to 600	750
2		600	850
4		900	1050
6		1150	1200
8		1400	1500

34.10 Recommended circular table sizes for various place numbers



4.5 Minimum space between tables to allow for seating, access and circulation



34.2 Food service planning

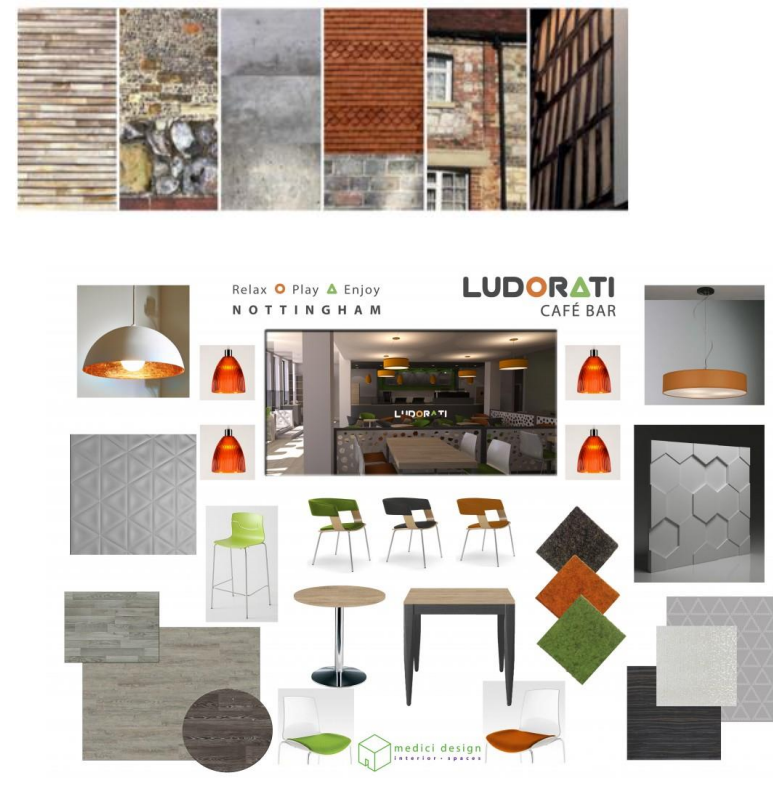
This design data should help with your layout and working out how to layout your furniture.

Looking at other cafe floor plans could help too.

Design Data

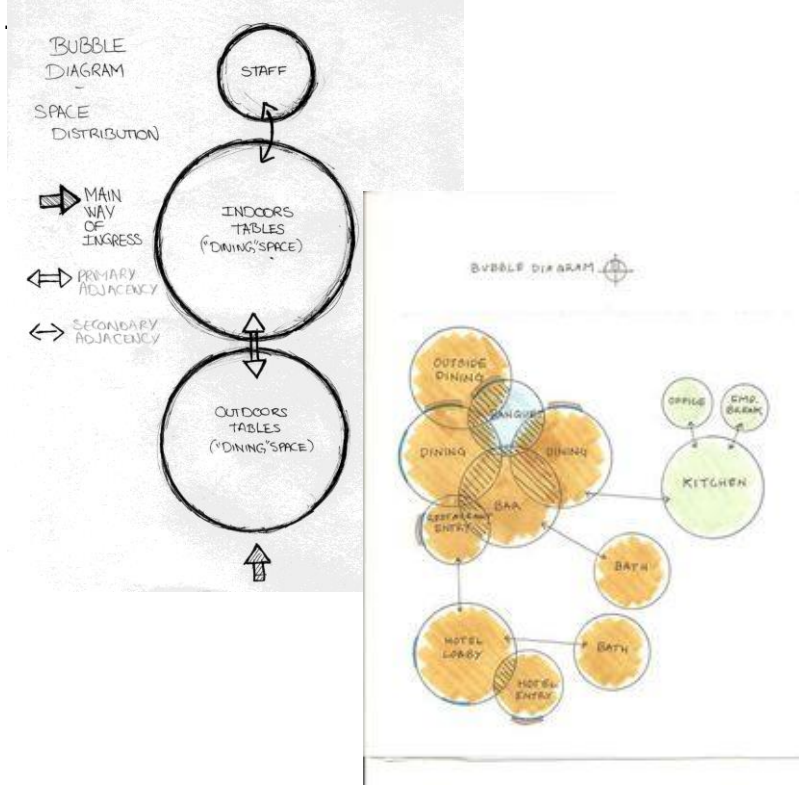
Materiality

A materiality board is just a series of images of the materials that you plan to use in your building. Think about the walls, roof, windows and doors. You could also include the interior and furniture.



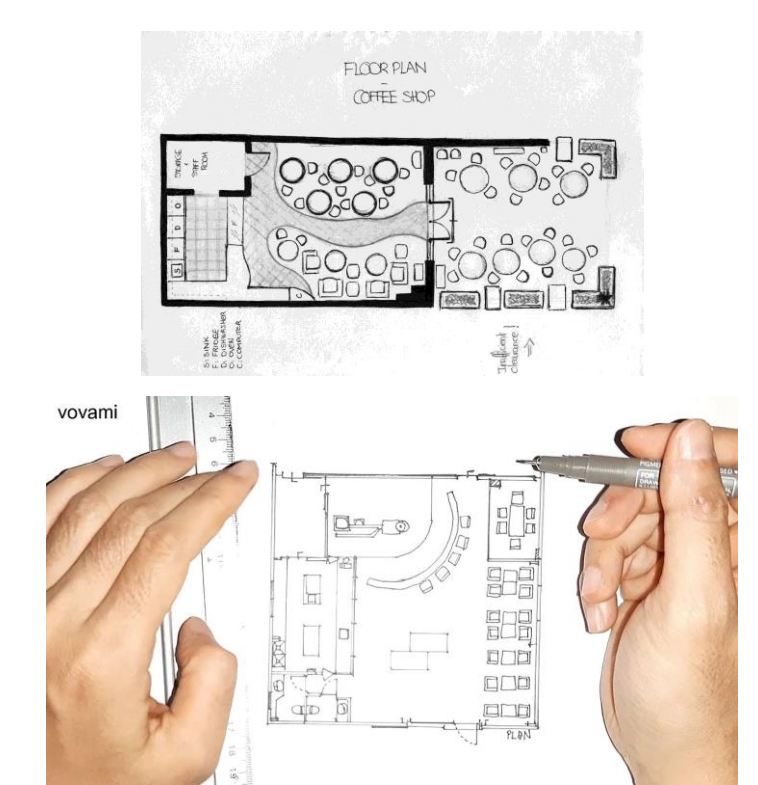
Bubble Diagram

A Bubble Diagram is used to explore the arrangement of rooms and spaces. Start off by drawing bubbles for each room and then thinking about how they connect. Then think about where entrances and exits could go. This should be an informal sketch.



Floor Plan

A Floor Plan is used to show how big the spaces will be and where the windows and doors will go. It can be a sketch or a more formal scale drawing. Squared paper can be really helpful or just use a ruler and pencil.

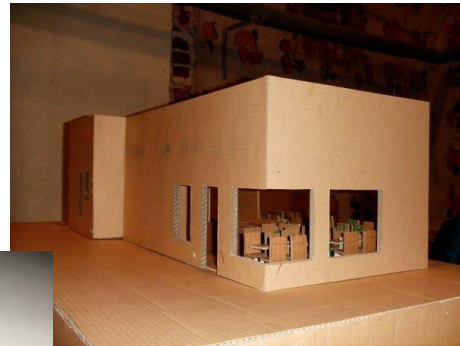
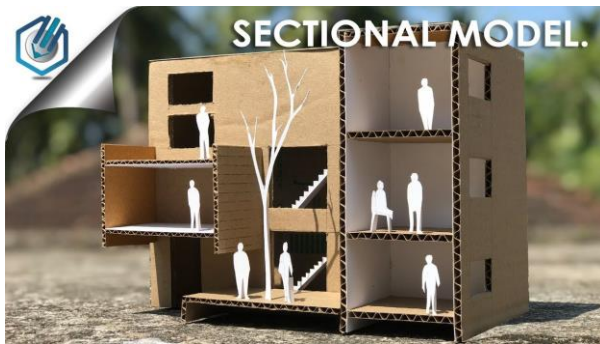


Modelling

Card Model

Card is a brilliant modelling material that will help you to understand your building.

You could do a scale model by using your floor plan.



Digital model

We will be using Autodesk REVIT next year to create 3D computer models. For this project you can use anything. Roblox Studio, SIMS, Sketch UP.



Free Software



<https://formit.autodesk.com/>

You can use this in a browser or download the programme to your computer. Loads of tutorials on You Tube

Great for block models on a site, use the postcode to define your location.



<https://www.autodesk.com/education/free-software/revit>

You need to create an account to download the programme to your computer.

<https://academy.autodesk.com/product-how-to>

Creates detailed building models.



<https://www.sketchup.com/plans-and-pricing/sketchup-free>

You need to create an account. Lots of tutorials available on You Tube.

