BTEC Construction - Unit 3
Project Knowledge Organiser

Construction Industry

Civil Engineering		Civil Engineering includes the following types of construction: Railways, Roads, Bridges, Air Travel, Sea Defences, River and Harbour Works and Renewable Energy Projects.
Industrial		Industrial Construction includes the following types of production: Factories, Industrial workshops, Industrial Estates and Industrial Units.
Residential		Residential Construction includes the following types of production: Private Houses, Flats, Apartments, Housing Association Properties and Social Housing.
Commercial		Commercial Construction includes the following types of production: Retails Units, Shops, Offices and Business Parks.
Health		Health Construction includes the following types of production: Hospitals, Community Care Centres, Retirement Homes, Clinics and Medical Centre Developments
Retail		Retail Construction includes the following types of production: Shop Refurbishments, Public House Refurbishment, Shopping Parks and Retail Centres.
Education & Leisure		Education and Leisure Construction includes the following types of production: New Schools, Further Education Facilities, Universities and Training Centres.
Recreation		Recreation Construction includes the following types of production: Cinemas, Sports Facilities, All-weather facilities and football stadiums.

Within each sector there are a number of activities including:

1. **Design and construction** of new buildings and structures
2. **Repairs and maintenance of buildings**: to prevent further damage or decay; to maintain the aesthetics of the building; to maintain the value of the building; and to maintain a safe building environment.
3. **Refurbishment of buildings**: bringing a building back to a useful condition using original materials or modern alternatives
4. **Renovation of buildings**: which is where the refurbishment also includes alterations and adaptations for example when an old church or bank is converted into a Weatherspoon's Pub
5. **Estates management:** where a series of buildings are managed and maintained
6. **Facilities management:** where the building is managed to include: maintenance; repairs; lettings; cleaning; canteen facilities; security; car parking; health and safety etc

Why are Buildings Designed for Different Functions?

Appearance and Aesthetics – Creating an attractive, innovative and outstanding design for the external and internal space of a building. (making the building look good).

Sustainability – Using green technology and materials to reduce harmful impact onto the environment.

Functionality – creating a space or areas that are provides useful services so the building provides the function is was designed for. (no unnecessary features).

Occupant Safety – allowing safe access for everyone who uses the building or facility.

Contribution To Infrastructure: Infrastructure Definition – The basic structures needed for the operation of a society, including roads, buildings and power supply.

1. Transport Networks – such as roads, rail, airports and motorways.

2. Drainage – Waste connections to houses, offices and other commercial buildings such as shops or retail outlets.

3. Services – supplies of water, gas, electricity and communications to houses and towns.

4. Flood defences – provisions of defences to protect our buildings from flooding by rivers and rising sea levels.

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Social Benefits of Construction:

- **Inner City Regeneration –** Old unfit buildings are demolished and rebuilt providing needed facilities into the local community.
- **Lower Crime –** Better planned construction makes for attractive safe communities.
- **Affordable housing –** planners have to include this type of housing to allow people the opportunity to own their homes.
- **Reduction in pollution –** inclusion of alternative transport (trams, buses and light railways) reduce reliance on cars.



Economic Benefits of Construction:

- **Employment –** puts money back into the local community through local businesses, taxes and council spending.
- **Home Ownership –** value of homes increases, meaning the homeowners get a good return.
- **New developments** - attract further commercial opportunities.
- **Economic migration –** a booming construction industry attracts workers from other areas of the country or other countries so more construction can take place.



So Who Benefits?

Benefits to the built environment.

- Regeneration of old and rundown urban centres.
- Constructing attractive and efficient new buildings and developments.

Benefits to the local community.

- Regeneration of the local area.
- Employment in local region.
- Improves transport networks.
- Creates green open spaces.
- Draws in tourists which boosts the local economy.

Benefits to the whole UK.

- Number of people in employment (2million jobs)
- Encourages spending and growth of the economy in the UK

General Benefits on the Local Community:

- Housing – Including low-cost affordable homes in planned construction projects.
- Green Spaces – social spaces such as parks, play grounds and community facilities.
- Transports Hubs – well planned transport hubs which allow community travel through modes such as buses and trains.
- Employment – the construction industry provides a range of opportunities for employment from professional positions to on-site operative roles.
- Security – infrastructure for street lights and safe secure buildings to provide a safe comfortable environment to live in.

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Learning Aim B - Scenario:

1. You are working in an architectural practice which has been commissioned to design a new building for a client.

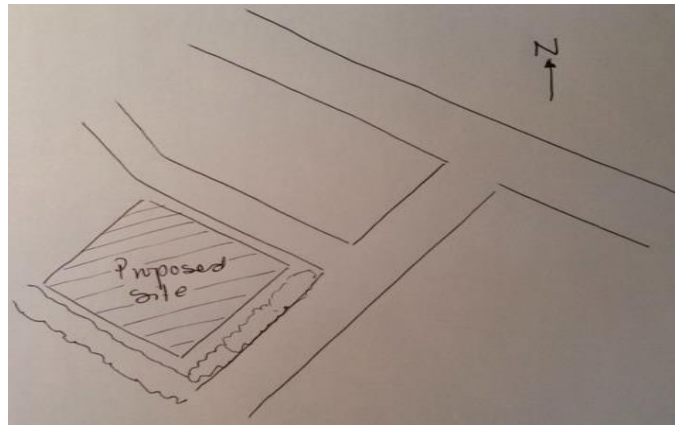
2. You have been asked to assist one of the partners responsible for the commission.

3. You will be required to analyse the client's needs and the requirements or constraints of the site and locality, in order to produce a client brief.

Scenario:

Site / location details:

- Level site 30m wide by 30m deep
- Is a greenfield site
- Location as shown on the location plan
- All services are available within 3m of the site boundary
- Development falls within the local development plan
- The site is exposed to high winds and backs onto a farmer's field
- A small stream runs along the back of the site on the boundary to the farmer's field



Client Profile:

- Professional couple with two children, 3 and 5
- Currently live in a two-bedroom semi-detached house on a local estate with a floor area of 100m^2 valued at £185,000
- Require a bedroom for each child
- One partner is a teacher
- Other partner is an estate agent
- Would like to have a space to entertain guests
- Both need be able to work at home on occasions (Office required)
- Would like to have a spare room for visitors
- Value high quality and value for money
- Would like to new home to blend in with the surrounding buildings
- Are environmentally conscious and want to incorporate sustainable energy supplies
- Have a budget of £425,000 (suited to match local property values)
- Have purchased a plot of land on the corner of a cul-de-sac
- Want to design to make best use of the open views provided by the location
- Would like to move into their new home within 12 months

Analysis of Needs

- Sustainability
- Building Use (What is it going to be used for?)
- Accommodation (Size, Type and Number of Rooms)
- Style and Aesthetics
- Materials (the materials used need to be in keeping the local properties).
- Budget
- Site (area, Location, Access and Services)

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Constraints on Design and Developments

Greenfield Site (Link to less sustainable)
Planning Permission required.
Small Site Size (30m x 20m = 600m^2)
Stream along the back of the site.
Exposed to high winds.

Mood Board

Produce a mood board based on the clients needs for the new property coving the following areas (Between 20-30 pictures required):

- External Appearance
- External Features
- Internal Living Accommodation
- Kitchen
- Bathroom
- Bedrooms

List of Design Idea Requirements

You need explain why the following points are constraints for the project: You can either do this through a mood board or in paragraphs.

- Elevated ground floor (flooding).
- Double garage.
- Fence to the footpath.
- Pipe off stream (flooding).
- Driveway access.
- Materials from local suppliers (sustainability)

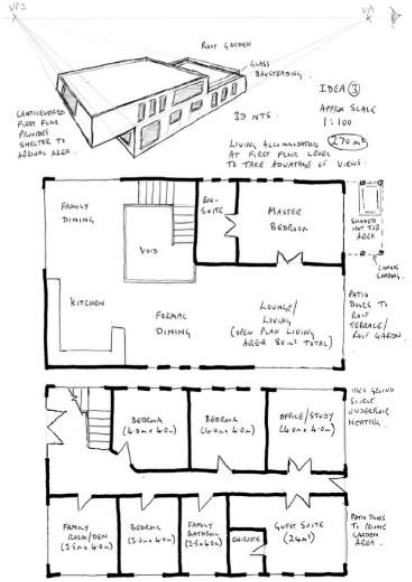
Summary of Client Brief

In the summary of clients brief you need to write these up into full sentences:

- 5 Double Bedrooms (Essential)
- En-suite in Main Bedroom (Essential)
- Large reception room, 75m^2 (High)
- Stairs to be a feature (Medium)
- Study / Office space (Essential)
- Energy Technology (Medium)
- Traditional or Contemporary Design (High)
- £475,000 Budget (Essential)
- Fit within plot (20 x 30m)
- Use the views (High)
- Opportunities for future extensions (Low)
- Reduce the risk of flooding (Essential)
- High quality materials (High)

Design Ideas

Create a range of design ideas based on the client brief and design idea requirements. **4 designs for L2D, 3 designs for L2M, 2 designs for L2P.**



Review of Ideas & Client Feedback

Using the summary of design brief from learning aim B. Review the ideas against the brief to evaluate which house meets the criteria the best before selecting one design to adapt and review.

Speak to the client on the range of design ideas to gain feedback on each design and to suggest areas of strength and potential areas for improvement.