

Planning, design and production phases of the construction industry

[Business](#)



Process of any project is mapped out in stages; firstly a very generic outline of the project and how the future of the work will evolve is prepared by the client. Once the client knows what they want they can then employ an architect. The architect must then decide if the client's idea is feasible – the cost, scale, and purpose of the building must be scrutinised.

By now a team should now be involved with running the project including, a quantity surveyor(s), engineers, and any specialists that might be needed. Once the design has been drafted, re-drafted and the exact idea has been finalised, the local authorities can be informed of the work and any other approving authorities can agree the work. The Quantity Surveyor can now produce an information pack outlining the fees, costs and arrangements for tendering a contractor; these are known as a Bill of Quantities. Once a contractor has been found planning can begin on the arrangements to be made to start work on site. Once complete the work can start with the contractors and any sub-contractors they may have employed following the plan set out and the design that has been agreed. When the work is completed and handed over the management team can finalise any costs and evaluate the finish product to ensure it is to the clients' specifications.

(Refer to Appendix 01) The design process:> Inception; the client produces a plan of their idea, who and what is involved to produce their idea. They must also produce an action plan to monitor the scope of work, an architect may be part of the project at this stage, For example what type of building is it and what purpose will the building serve, how big does the client want it.

Other aspects such as the location of the building and factors which could affect access to the buildings. On the site used in this project the A12, (a <https://assignbuster.com/planning-design-and-production-phases-of-the-construction-industry/>

busy major road), would be a big factor that could affect the design elements of the project. The timescale of the project, when does the building need to be finished by? And lastly what budget does the client have and can the project be completed within it.

> Feasibility; at this stage the client has definitely introduced an architect and he can now produce a report showing any adjustments he has made to the idea to make it more cost effective, the scale of the work is more reasonable and the building serves its purpose. The architect should use a QS, engineers and Service Co-ordinators to assess the site and costs to help reach conclusions, For example each member of the design team now has a task set for them - The Quantity Surveyor can look at the costs and manage the project according to the budget. The Structural Engineer needs to assess the proposed site, sample the soil and make initial contact with the local authorities regarding highway restrictions and access roads leading from the A12, the Engineer can also plan how the building is to be built according to its surroundings. The Service Co-ordinator has the responsibility to ensure buildings can have an efficient utility supply and where the supplies come from and go to, they also need to assess the environmental and impact of this.> Outline Proposals, (can only commence if the brief is completed in full); the brief needs to be developed further; if specialists are required then they need to be introduced to the project. Rough CAD drawings can be put together and sketches can be drawn to show the proposed layout, and construction.

For example the Architect must have reports showing facts and figures to enable the client to formerly approve the design, the QS needs to outline the estimated final costs along with any alternative resources that maybe used. The Structural Engineer can now advise on what methods will be used to construct the building and what materials will be used along with some alternatives. From this any contractors and services needed to achieve the design can be sourced.> Scheme design; now the aesthetics of the building need to be decided, more accurate costs, and exact construction details are amongst some of the fine points that need to be noted. This information must be put forward to generate accurate reports that are submitted to appropriate authorities for approval, For example the Architect will negotiate final design inputs from the client and these will be developed for the client's approval.

The Quantity Surveyors role at this stage is to have the costs for the design and any alternatives for the client to choose if required for their design. The Structural Engineer needs to have an action plan in place to show how and why he has chosen those methods and materials for the building; the client can then agree the plan in principle. The Service Co-ordinator needs to have reports, a plan of what utility design will be used, and what options the client has as to where they would like the services to run to and from.; Detail design; now the design is accurate and to the clients specifications every aspect has to be finalised with this being the last opportunity for any alterations to the brief. The actual costs have to be applied in relation to the work and all components of the building need to be fully designed and agreed collectively, For example the design team as mentioned above need

to have the final designs, reports and plans ready for the client's permission to go ahead with the project.

From here the brief will be monitored by the Architect to ensure the project is running to the specifications outlined by the design. The Structural Engineer needs to ensure his calculations are accurate to the design so he can organise and manage the builders effectively. The Quantity Surveyor has to maintain the costs and control and manage the budget to ensure it meets the guidelines set out in the design. This stage-by-stage outline is set out in the RIBA plan of work and some companies follow this to introduce projects that they may acquire. Design process for Civil Engineering This design process is very similar to the design process for Building Construction.

However there are subtle differences in Civil Engineering's approach to this process as most of the work involves ground works. They still use the main points listed above but the team work in a slightly different way; The Civil Engineering industry do not use Architects, they use ' Civil Engineers' to run the project, (also known as the Project Manager). This part of the design process has the Contractor working with the design team to speed the process up. The Building process has the contractor being employed once the design brief has been finalised. Working this way means the contractors have no input to the design and this could cause delays in the early stages of construction when the Contractors are unable to work with the brief. With the Contractors being heavily involved from the beginning any technical difficulties can be ironed out simply and easily.

Planning Process for Building Construction This stage of construction means implementing the design before construction starts. By having a planned process it means you can have a schedule to work to which could possibly also include deadlines for certain stages of the work.

- Planning Consent, Before work can begin it is important to have planning permission in place with the local authority by means of completing an application form. For this the architect needs to contact the local authority and fill in any required forms.
- Building Control To meet building regulations the architect needs to show the local council any sketches or scale drawings he might have produced to show measurements, dimensions, and the lay out of the finished construction.

The general infrastructure needs to meet current building regulations so, things such as materials used need to meet the local surroundings, existing residents need to be considered as well. These two stages will be dealt with by the Planning Department at the local Council enabling the initial forms to be filled in followed by a number of site meetings arranged by them for the architect and the Council. *Information sourced from Havering Council's website.

- The design Team The design team should be involved from the beginning of the project but if the architect chooses he can employ a team at this stage of planning. The team need to draw up plans and decide the actual details of the construction.

- Site investigation/Land A site investigation needs to be conducted to assess the ground conditions, the existing area, layout, and grand scheme of the project. The main principle of this action is to determine if and where the

building can be put and how much work will be involved. For example – do CDM regulations apply? If so then the business needs to ensure they comply with the regulations. The Construction Design and Management regulations are designed to direct the management of health and safety. The regulations are maintained by a CDM Co-ordinator or Planning Supervisor and their job is to ensure all risks are eliminated and the health and safety policies and procedures are in place and being used. By way of ensuring the regulations are being applied a risk assessment of the site will have to be undertaken, and all possible dangers and how they can be avoided or eliminated must be detailed.

At the end of a project a Health and Safety file is compiled showing the data information on how the site has performed through its audits. Through implementing this procedure the company can then achieve different standard schemes. For customer based construction companies like the utilities maintenance industry or housing developers then standards like the ISO9001, (a Government managed regulation system), can be gained. *

Information sourced from CDM website.- Costs At the same time as the above stages the team need to count the costs and implications of the project, they need to ascertain if the budget will meet actual costs of the construction when important things like contractors, labour and materials are weighed up.

- Organisation Once the land has been investigated, the size of the project has been estimated and all costs have been calculated a schedule can be put together for the completion of works. In most cases the work is set out in stages with different contractors involved with each stage, these people

need to be organised so they all can work efficiently at certain periods of the project. If people have a goal to aim for then the structure of the process can run as smoothly as possible. The likely hood is these stages will actually run alongside each other so even though there is a structure there is a chance the process will overlap, for example planning permission maybe applied whilst the site investigation is being conducted.

Planning Process for Civil Engineering- Funding Once the contract has been won, the Civil Engineers need to know roughly how much money will be spent on the project.

To get things moving an initial payment may need to be made upfront. It is important to have an idea of how much money can be spent on labour and machinery so they know how long the project will run for.

- Time scale Once the engineers know how much they have to fund the project then they can calculate how many teams and machinery they can have on site, this will give a rough estimate as to how long the construction will run for. However it is hard for the Civil Engineers to work to a tight budget as the scope of work can change quite often.

- Site Investigation The land needs to be surveyed and the site needs to be assessed to help mould the design and construction process of the project. By looking at the surrounding land and the proposed building area it is possible to ascertain any factors that may affect the process.

The ground needs to be tested and soil testing would more than likely take place to check for contamination. From there the scope of work can be estimated but it cannot be measured accurately as it will change as the construction moves forward.

P1b Compare and Contrast the Design Process

for Building and Civil Engineering Projects The Building construction industry uses a Bill of Quantities to pay for their projects, the prices are worked out and listed before the work begins. Everything is accounted for from the cost of providing safety boots to the price of screws. The work can be paid either per day or a total amount can be agreed and paid on completion of each stage.

As the client has a brief for the architect to adhere to the plan of work can be set out and followed exactly, minimising the risk of delays. The plan is set out very strategically allowing contractors to know where and how they should work, however the schedule can be tight and quite often cannot be changed. With Civil Engineering the work is priced using rates, and the contractors charge by the amount of work they have done rather than the amount of work there is to do as the work can vary and on some sites unpredictable. This is because they know the goal that has to be achieved; they are also working according to the brief set out by the client. However, the work has to be measured then re-measured as the construction progresses; this is mainly because the bulk of their section on the project is ground works, which is an unknown area to work within. Fundamentally the two divisions differ because building projects can be easily 'costed' with a carefully worked out schedule, whereas civil engineering projects have a dead line to work to that is not entirely set in stone.

Also they know the work involved but are unsure of the amount to work to be done, the result being the scope of work is constantly re-measured. P1cAs the Project Manager for a housing developer I have been asked to develop

and construct new housing on a delicate site. As it stands at the moment, part of the ground is currently home to a redundant chemical factory and as a result the soil is contaminated. It is my job to ensure the contaminated ground is disposed of and the area is safe to build on. I also have to take into account the welfare of the surrounding community as the site will most likely produce a large amount of noise and dust pollution, I will have to take measures to insure this is kept to a minimum.

This is a very large project that also includes the construction of an access road that branches off from a very busy 'A' road. The following shows my step-by-step plan through the processes of this project. My clients' brief is to build 2, 3, and 4 bedroom luxury homes and one block of three storey flats. They wish to have all aspects of the construction included, incorporated in this are carports, fencing, landscaping, all roads and street lighting. In the contract I am to plan the demolishing of the chemical factory, remove the contaminated soil then backfill to meet the required level. Describe the main stages of the production phase of the construction process(Research taken from Appendix 02 and Researched using Appendix 3)For my site the main stages of construction have to include the demolition of the redundant factory, the removal of the contaminated soil, the construction of a 1m stretch of road leading from a major road, and the all roads and lighting that are part of the infrastructure for the site.

The stages are as follows;; Site Investigation. Initially the soil has to be assessed and tested for contamination. Certain considerations have to be looked into regarding the site layout for example, storage for materials,

Temporary or permanent services, Plant – is it static or mobile, Fencing and hoardings, Health and Safety and Site security. On this site it is important to have the security set up 1st. As the development site is large and so close to the A12, it is best to have a guarded Security gate and night guards to patrol the site.

The hoardings have to be put up around the perimeter of the site – this must follow the footpaths along Havering Road and Chase Cross Road with a gap to be utilised as access for works vehicles. For lighting the site, temporary facilities will be provided as in our contract we are to provide the streetlights for the new development. Portable Offices will be placed on site near the entrance along with temporary services including a canteen and sanitary facilities. Essential services such as water and electricity will be laid. Six large storage containers will be put on site initially to house materials and small plant; this will then be revised as the project moves forward.

The health and Safety coordinator will deal with health and Safety accordingly.; Clear the SiteThe chemical factory has to be demolished, for this a specialist contractor such as CAJ Services Ltd, (see their website http://www.cajservices.co.uk/Demolition_Services.html), will be employed to demolish the factory they will also strip the

contaminated topsoil down to a depth of approximately 3m using mechanical aids such as scrapers. The same is to be done with the rest of the site, and any uncontaminated soil can be stored for later use. Once complete new topsoil will be laid and levelled ready for construction.; Setting OutNow the site has been cleared, stripped and levelled the first building can be set out

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using the plans drawn up by the Design Team. The most important factor of setting out is accuracy; hence the need for measuring and re-measuring is imperative.

My contractor needs to find the precise location and size of the clients' buildings. With the trenches marked out the main construction can begin.> Construction of the Access RoadAs per the specification this access road is approximately 1 mile in length branching off from the A12. As soon as the earthworks have been completed the construction of the road will begin with the a layer of hardcore pored where we have had to dig deeper than 0. 5m, then the rest of the layers are added to form the road.

The footpath is then constructed according to the brief and in line with building regulations. Street lighting and drainage will all be added during this stage. The roads leading from the access road to the new dwellings will be built in the same way at the start of each phase.> Trench ExcavationsMy Contractors need to excavate to remove earth so the foundations and services can be laid. The contractors will follow the profile set out previously- the depth, width and direction of the trenches are set out accurately and this process needs to be controlled and measured to eliminate the chance for errors.

> FoundationsWith the trenches excavated the concrete strip foundations can be pored accordingly and at the same time my contractor will be instructed to lay the ducts for the services, meaning the path for the gas, water and electric services is laid which will be connected to the mains situated outside the buildings perimeter. The Damp Proof Course can be

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completed according to building regulations while the concrete is setting.>
ServicesWith the foundations complete, the contractors can begin to lay the actual services to the house, the reason for laying them at this stage is to reduce the amount of machinery used thus reducing the man power required and also will help diminish the disturbance to the site as all the ground works will be done at the same time.- These stages will be combined and completed in phases, the construction process will be repeated according to the design plan and the amount of buildings required. The ground works will always be the first part of construction started.> Construction of the buildingsThe next stage of construction is to bring in the skilled labour to start the erection of the buildings.

As this a large project there will be several teams working on different plots to speed up the process. Initially the concrete base needs to be pored over the foundation, the reasons for this are twofold - this help lay a flat, smooth floor and it means the walls can be built on a hard flat surface. Once this is done the first floor can be built. With the outer wall completed the scaffolding can go up, windows and doors can be installed and first floor joists attached. Next the second floor is constructed up to roof level.

With the bricklayers moving onto another plot, the carpenter can begin work on the roof.> External WorksNow the house is finished the cleaning up process can begin and my team of specialists can begin work on the aesthetics of the building can begin. Landscaping the front and back garden is completed and if required on the particular building the driveway will be laid with brick paving.> Internal WorksThe aesthetics need to be completed

as per the design brief, any painting and decorating along with any furniture is to be added to each property.> Completion To ensure the properties are built to Building Regulations and to the clients specification they have to be checked and passed by the Clerk of Works.

Once they are handed over the properties are ready for the new owners to move in.- This process will be applied to all aspects of the development including the construction of the flats. Works Flow Chart Organisational Flow chart Site Layout (Picture taken from assignment Drawing 001)- The works flow chart shows the step-by-step process of how the work will progress, it is very basic and only shows a general outline of how the work is to flow. The work is carried out in the order that shows on the chart and it is colour coordinated with the Organisational Flow Chart to highlight the teams that are involved with the individual sections of the work.- When a project is particularly large it can be very confusing for contractors to know who to take instructions from, this can lead to very bad communication between the senior members of staff and the workers on site.

The organisational chart can help with the confusion allowing work to continue with fewer delays. The Organisational Flow Chart outlines who reports to whom. It shows the order line for the people in charge and helps those who are working on site understand how information is passed along and who their Line Manager is.- The Project Programme, (see appendix 04), shows the entire life span of the project detailing the scheduled start and finish time-lines for the phases. The programme is drawn up before work begins and the work is carried out accordingly.

If delays occur the programme cannot be altered to accommodate them, this is usually how deadlines are missed. From this the Contract Managers can plan the individual teams and make sure the contractors know the scale of time in which they have to complete the phases in.- The Budget given to me by the client restricts the amount of staff I can have and the time it can take to complete the project. To ensure the project runs smoothly it will be completed in phases. The phases will overlap each other, so a set plan of work must be arranged by the Contract Managers in charge of each division, (Building Construction and Civil Engineering).

The Contract Managers are entrusted to keep track of their staff, time management; holidays and sickness must be monitored and agreed by them. Weekly meetings with Contract Managers, Site Managers and Quantity Surveyors will take place along with monthly update reports. So every Contractor, labourer and staff member are aware of who their Line Manager is they must have a staff induction. To keep in line with Health and Safety, the Health and Safety Coordinator will take everybody through the company Health and Safety Policies and Procedures. The store Managers are to keep myself and the Contract Managers up to date with monthly reports showing how much is being spent on materials and the frequency at which the materials are being used.

P1D Compare the co-ordination management of each phase of the design and construction process With both sides of a development from Design to Construction, there is one major aspect that can damage the timeline and flow of the project and that is poor communication. With the Design team, if

the architect does not convert the clients' ideas onto paper correctly the whole project is compromised from the very beginning. The Construction process follows a similar pattern – The Project Manager needs to know exactly what is expected from his team and sub-contactors, if this information is passed on incorrectly then the construction process could become a very costly mistake. So everyone is aware of the stages and what order they are to be completed in, it is important to have a works flow process. The same applies for the design team, they need to know who is in charge and what part of the project they are involved with, who do they report to and if there is problem who do they go to; To help with these questions usually an Organisational Flow Chart is sent out to all employees either by email or post.

With the Construction side of the project, there is a similar process however it is much clearer who is in charge as they are usually on site every day and make them self known through an induction. Modern organisations no longer have the Architect as the person in charge, mainly because the structure of today's companies means the person in charge must not specialise in one subject. The Architects role has been demoted slightly as rather than employ lots of different company's and have lots of people in charge it is easier to have one contractor do all the work with one person in charge – this person being the Project Manager. The industry has had to evolve to meet the needs of ever demanding clients who want their project completed quickly and easily.