



*The Institution
of Structural
Engineers*

Your Home Project Guide To Appointing A Structural Engineer

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International HQ
47-58 Bastwick Street, London EC1V 3PS, United Kingdom
Telephone: +44(0)20 7235 4535
Email: mail@istructe.org Website: www.istructe.org

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Appointing a Structural Engineer for your Domestic Project

A homeowners' guide to renovations, extensions and new builds

About this guide

Whether you are planning to build a new home or perhaps modify, extend or refurbish an existing property you will have great hopes and aspirations for a successful project. The construction industry is complex and you may be feeling at least a little daunted by all that will be involved in achieving your dream.

This guide has been produced by The Institution of Structural Engineers, which is a professional organisation incorporated by Royal Charter, recognised globally for its rigorous entrance examinations for those who wish to become members. Throughout their career Institution members must continue to study and demonstrate professional development so that their knowledge and skills remain up to date.

The Institution has endeavoured to ensure the accuracy of this guide, however the comments made must be taken as general guidance and readers should take specialist advice on the specific projects being considered or undertaken.

Introduction

Building work needs to comply with a lot of regulations and legal obligations. Whilst information on roles and responsibilities of the structural engineer are common across the UK it is important to remember that the rules you must follow might not necessarily be the same in Scotland and Northern Ireland as in England or Wales.

This guide can therefore only deal in general terms. It cannot and should not in any way be considered a substitute for building-specific advice. It does however, give broad guidance on when, where and how to go about seeking further guidance and services from structural engineers and other construction industry professionals.

In [Chapter 1](#) we introduce you to structural engineers and some of the other construction industry professionals you may come across. It gives an overview of when a structural engineer may be needed, and of the value they can bring to your project.

- [Chapter 2](#) introduces relevant regulations.
- [Chapter 3](#) gives project advice tailored to a number of scenarios.
- [Chapter 4](#) gives advice on engaging a structural engineer.

We hope you find this guide helpful and wish you every success with your home improvements.

Chapter 1

Construction professionals

1 Construction professionals

Overview

Any physical construction work is likely to require the use of a builder, trade specialists or an installation team. Sometimes these companies will also be able to offer design services. It is, however, traditional and remains industry standard for a builder to be reliant on good, clear technical instructions prepared by independently engaged design professionals.

As the customer, you will be at the helm and your project will need you to be part of the team.

The customer

Ever present, this is the person paying for the services. In the case of domestic projects this is usually the owner/landlord, though you may be a leaseholder and/or a tenant with the freeholder's/landlord's consent.

The end users

End users are typically the customer and/or family members, property landlords or tenants. These are the people whose needs and dreams are driving and guiding the work and its outcomes.

Designers

These may include *structural engineers, architects, building surveyors, interior designers, external landscape architects* and other specialists.

Designers are professionals, often referred to as 'consultants'. They plan and document the work to be done and will typically complete much of their work prior to the *builder* starting on site.

Designers may operate as sole practitioners or from within businesses of varying sizes. What is important is not so much the size of the business but that it is competent to fulfil the services you require in a timely manner and this includes advising you and ensuring all regulatory and legal requirements are met.

“As the customer, you will be at the helm and your project will need you to be part of the team”

Structural engineers

The structure of a building includes all the material components that ensure the building stands up; from the ground and foundations it stands on, through to the top of the roof, chimney etc. A building's structure is critical to its safety, form and function.

A *structural engineer* is a designer, competent to advise on alterations to the structure of existing buildings and to design the structure of new buildings or extensions in accordance with regulation and legislation. Very many structural engineers have specific expertise in assessing and advising on the reasons for, and solutions to, structural defects occurring to a property.

It is unusual for all the designers (e.g. the *structural engineer*, the *architectural designer*) to be available from a single business; more often, they are each individual businesses.

Architectural designers

Architectural designers are responsible for spatial planning and room layout, the detailing of non-structural components and the specification of finishes. There is no legal requirement to engage an *architectural designer*. However, like *structural engineers*, they can bring experience and value to a project.

Structural engineers can work independently or in collaboration with *architectural designers*. Whilst *structural engineers* can fulfil all the services on simple projects, collaborative working is recommended on more complicated building projects. Either professional can advise when involvement by the other is warranted.

Search for a *structural engineer* near you at istructe.org/building-confidence

Structural engineers can often recommend *architects/architectural designers* and if you wish may even appoint them as a sub-consultant keeping your contractual responsibility to a minimum.

Lead designer

Where *structural engineers* are working collaboratively with other designers it is advisable that one party is formally appointed in a leading role. The *lead designer* will manage applications to the relevant authorities and generally coordinate the design components. This role can be filled by the *structural engineer*, *architectural designer* or other designer but the role can often best be fulfilled by *structural engineers* on technically complicated projects.

Building surveyors

Building surveyors have a broad skillset, from project management to advising on energy efficiency. In many instances their services could have an overlap with those offered by *architectural designers*.

Regulators

- There are two principal regulators for domestic projects:
- Planning Officers are employed by local authorities to manage the granting of consent for work that requires planning permission. Their role is to ensure works confirm to Planning Regulations, local planning rules and restrictions.
- Building Control Officers (also known as District Surveyors in Greater London) are employed to ensure that works comply with Building Regulations by reviewing design information and conducting inspections at appropriate stages of building work. Traditionally, they are employed by the local authority. In England and Wales the service can also be performed by independent private sector providers called Approved Inspectors. In Scotland, Building Standards requirements can be overseen by *structural engineers* registered as Approved Certifiers of Design.

The builder

The *builder* is typically the person or organisation the customer will appoint to construct and complete the work in accordance with the design.

Individual *builders* will usually employ one or more trade skills but may also appoint sub-contractors and trade specialists to complete specific tasks (e.g. brick layers, plasterers, plumbers, electricians).

Larger building companies may have internal designers and provide an all-inclusive service to the customer. While these companies can make the process simple for the customer, they can charge a premium for the additional services.

Builders are constructors and whilst often highly experienced they do not usually offer design services. Before accepting advice from a *builder* the customer is strongly recommended to confirm that they are competent to give advice at the level being offered, or have appointed design professionals to assist the project.

Finance providers

Banks and building societies will each set specific requirements as conditions on the finance they provide. These conditions should be determined before the start of the project as they may impact on the services you require. The timing of when you receive finance may also influence how or when you can make payments to your designers and/or *builder*.

Insurers

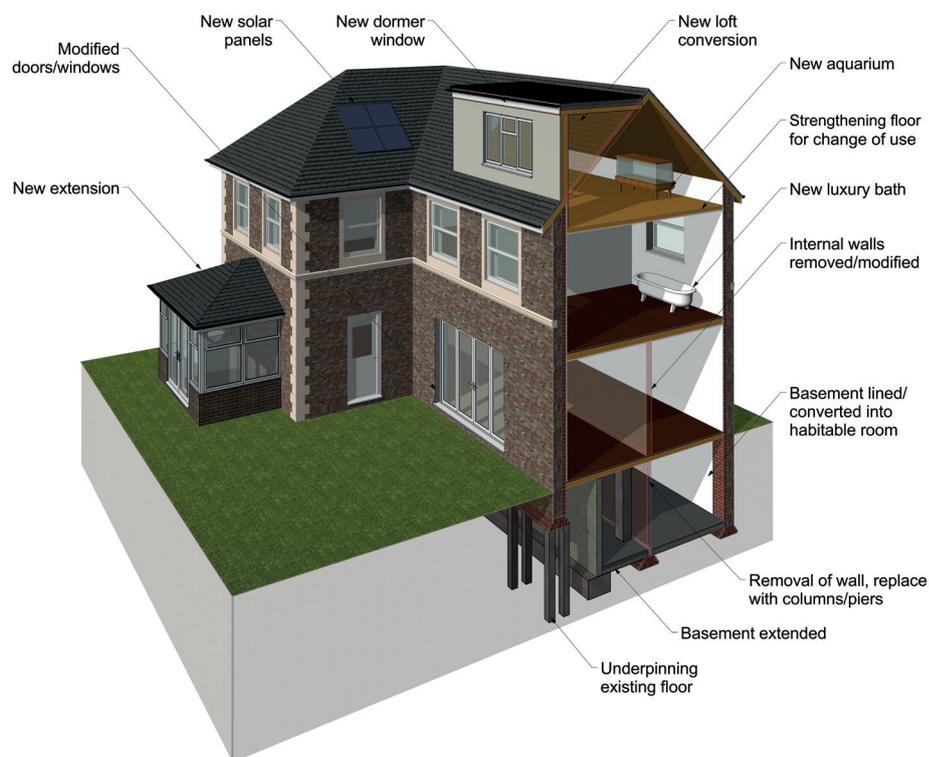
You should notify your building insurance provider prior to starting any significant works, particularly if the property will be unoccupied for any length of time. Refer to your insurance provider's terms and conditions for details.

When might a *structural engineer* be needed?

Whether you need a *structural engineer* depends on the nature of work or guidance you require. Principally, you may need the services of a *structural engineer* in the following situations:

It should be remembered there have been many instances of partial or complete collapse of buildings as a result of alterations being carried out without proper or adequate structural advice. It is also worth being mindful that inappropriate alterations to a property may invalidate a building's insurance.

By no means exhaustive, some typical situations which will warrant the involvement of a *structural engineer* are shown in Figure 1.



© Image produced by Michael Aubrey Partnership Ltd

Figure 1: Some typical situations that might warrant the services of a *structural engineer*

When checking:

- Deteriorating structural materials and the safety of a building that is old or in poor condition.
- The safety of a building impacted by a severe event (e.g. a flood, fire, collision)

When planning:

- Alterations to, or removal of, any existing structure including walls, chimneys, floors and roofs.
- The addition of new structure, either as a completely new building, an extension, or an internal remodelling.
- A change to a building's use, contents, fixtures and decorative materials that will alter the loads or impact on the structure.

When you have concerns about your property:

- Significant cracks or movements, doors or windows continually sticking etc.

Services offered by a *structural engineer* include:

Conducting inspections and surveys:

Inspection or survey reports may be carried out on development land, existing structures and materials. They can conclude with verbal guidance or a written report. There can be confusion concerning what constitutes a survey and an inspection and it is very important that this is clearly defined at the outset so that both the customer and the *structural engineer* can agree if there are limitations as to what can be provided.

“ A good structural engineer will devise an overall solution that will meet your particular circumstances ”

Inspections and surveys in relation to new build or modification projects may simply be to provide information to be used by the engineer in the development of a design. Together with *building surveyors*, *structural engineers* can complete a variety of different inspections for various purposes.

Advising on design options:

There is rarely one solution to a problem, and even minor 'tweaks' to a proposal can have significant impact on the overall cost, simplicity and ultimately the success of a project. Together with the *architectural designer*, the *structural engineer* is well placed to suggest options and provide guidance.

Producing design documents (calculations, drawings and specifications):

These are produced when changing existing or adding new structure. They provide instructions to the *builder*, information for the Regulators and also a record of the work undertaken that can be useful when completing future alterations or maintenance. *Structural engineers* may produce their own drawings, or provide information to the *architectural designer* to be included on their drawings.

Your *structural engineer* will be able to:

- Give advice to help you safeguard the future value of your property.
- Help you adhere to your regulatory duties.
- Help and advise other members of your team so that the overall work is carried out and completed efficiently.
- Provide impartial advice.
- Use their extensive experience to help you develop your ideas.
- Confirm that the builder has carried out work in accordance with the design information.
- Identify tailored, cost effective and practical solutions specific to the unique characteristics of your property.

A good *structural engineer* will devise an overall solution that will meet your particular circumstances, balancing the physical capability of materials, legislative requirements, site constraints, personal objectives and financial constraints.

In monetary terms, the fee for a *structural engineer* is likely to be small compared to the whole-life cost of your project. Through clever design, a good *structural engineer* may help you achieve financial benefits that far exceed the cost of their service.

Search for a *structural engineer* near you at
istructe.org/building-confidence

Chapter 2

Regulations

2 Regulations

Regulations and Legislation are the legal requirements imposed on building work by Government and Local Councils. Details may vary however they are broadly similar across the UK. Your design professionals can make submissions and conduct negotiations with Local Councils where necessary on your behalf, but cannot guarantee outcomes outside of their control.

The five key requirements to be aware of are:

Planning permission

Planning permission concerns the impact of a building on its surroundings. For houses it mostly concerns location, size, the outward appearance including materials and style, issues around water management/supply, waste water and flooding, and traffic and access issues.

A structural engineer will be able to advise property owners on the structural feasibility and affordability of their proposals before submitting an application. This may assist in establishing and managing budgets.

Building control

Building Regulations (England, Wales and Northern Ireland) and Building Standards (Scotland) set out minimum technical criteria for building work, covering aspects of safety as well as energy efficiency and accessibility.

A structural engineer can assist in an application by: ensuring the designs meet the criteria; assisting with the paperwork; and can, if requested, oversee that the builder follows through with the construction in accordance with the designs.

Works to a party wall or adjacent to your property boundary

In its simplest form, where a wall straddles or sits immediately adjacent to your property boundary or there is a structure providing support to an adjacent property, certain formal procedures need to be undertaken.

Your structural engineer may be a Party Wall Surveyor; alternatively they or an architectural designer may be able to recommend or engage a Party Wall Surveyor where Party Wall advice is required.

Listed Building and Conservation Area consent

If your property is classified as a Listed Building, you will need to apply for Listed Building consent prior to starting any renovation work. Equally, if your property or site is within a classified Conservation Area, you must apply for Conservation Area consent.

Both processes are extensions to a planning application and may require little structural technical design input. However, subsequent work on historic structures will often require specialist professionals familiar

with historic materials and methods of construction. The following register was set up with exactly this in mind:

www.careregister.org.uk

Alternatively, FindanEngineer.com lists many structural engineering practices specialising in 'historic structures'.

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Safety

Safety is crucial in all aspects of a building project and there are various rules and regulations that must be complied with. Your experienced team will be able to advise you.

Chapter 3

Typical Cases

3 Typical Cases

See more case studies at
istructe.org/building-confidence

In this chapter we describe some common examples of domestic projects and highlight many of the things you should consider when appointing professional support. Individual fact sheets are available from our website.

Case 1

A larger project – a significant extension to your existing home or a new-build home

In this example, there is significant potential for *structural engineers* and *architectural designers* to give broad conceptual advice that might help enhance your own ideas. They can assist you through the regulatory stages and also work with you to understand your budget, providing guidance on how much the work might cost and how alternative cost-effective solutions might help.

In this example perhaps more than any, the *builder* will be dependent on good quality, clear design information. A good set of drawings, schedules and specifications will provide more certainty to the *builder* allowing them to more accurately determine their fee (for materials and labour) in turn helping you get a keen price.

The following headings provide a structured approach to undertaking your project.

0. *Define your aspirations.*
1. *Develop specific objectives (a Brief) and agree the work to be done by designers.*
2. *Obtain one or more conceptual design options.*
3. *Develop the preferred design and seek regulatory consent.*
4. *Produce design instructions for the builder.*
5. *Appoint a builder to complete the construction works.*
6. *Obtain final regulatory certification.*
7. *Enjoy and maintain your property.*

Case 2

Home alterations

Examples might include changes such as the relocation of a door, insertion of a folding sliding door, the removal of a chimney, or the removal of an internal wall.

It is likely that the full plan of works of Case 1 will not be needed. Indeed, an *architectural designer* may not be needed at all if you are clear on what you want to achieve. The input of a competent *structural engineer* is however very strongly advised to ensure work is completed safely and in accordance with the Building Regulations and Standards. It is therefore recommended that your first point of contact is with a *structural engineer*, engaging them to complete stages 2, 3, 4, 5 and 6 (as listed in Case 1).

Case 3

You have concerns about a specific structural defect

It is recommended you employ a *structural engineer* to complete an inspection and report on the severity of the specific concern.

Once the inspection is complete, you may need to extend the appointment of your *structural engineer* or appoint a different *structural engineer* to design any remedial work. A *builder* would then be needed to carry out the work. These activities would generally be conducted in line with stages 4, 5 and 6 (as listed in Case 1).

Some structural damage may be covered by your house insurance although limitations to the cover may be applied by your insurer. This is commonly the case for subsidence and flooding. When considering a claim against an insurance policy, you should first check the terms and conditions and procedural guidance provided by the *insurance provider*. They may advise how to go about obtaining professional advice. An insurance company will appoint a loss adjuster to manage the claim who will often want to investigate and determine remedial works. Many loss adjusters are not qualified in structural engineering and there may be benefit in taking particular advice from a *structural engineer* in these circumstances.

Case 4

You are concerned about the general effects of an event such as a flood that has impacted on your property

Many *structural engineers* and *building surveyors* can advise on such matters and prepare a condition report. Should an inspection/survey conclude that structural problems are present, the report will likely advise that you arrange for a *structural engineer* to complete a more in-depth assessment to establish the corrective work. This should be conducted in line with Case 3.

Case 5

You are planning to buy a property

If you require a mortgage, your *finance provider* in order to safeguard their own interests will request that a valuation is completed. This is usually carried out by a *building surveyor* or property valuer. While such a valuation should identify faults (including subsidence) that would have impact on the value of the property, the valuation does not typically describe aspects that might cause inconvenience or require routine maintenance at your expense.

For a survey that gives increased peace-of-mind, you would need a suitably experienced *building surveyor* to complete a building (or condition) survey. Suitably competent and experienced *structural engineers* can also carry these out. This can only be completed with the permission of the vendor, and will normally be limited to what can be seen without damage to decorations and furnishings.

Should this survey conclude that structural problems are present, the report will likely advise you arrange for a *structural engineer* to carry out an inspection of the structure to determine the cause and extent of the specific problems. In terms of cost of the corrective work, the *structural engineer* may be able to give advice, but a *builder* is often better qualified to provide construction/modification cost estimates.

Surveys and inspections

In commissioning a *structural engineer* to undertake a survey or inspection it is important that you discuss and agree any limitations which may need to be applied to the scope of the survey or inspection.

Additionally it is recommended that you;

- Pass on information from one professional to the next; e.g. the findings of a previous survey.
- Communicate your expectations and any points of focus in a clear brief.

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Your professional advisor will be well versed in the intricacies of buildings in general however you may have specific knowledge of your property which they don't have and it will be in your interest to bring this to their attention.

The cost of a survey is linked closely to the professional's time. Before agreeing a price, be sure to understand what you're getting, and check that it's what you need. In general:

- If you agree a fixed price upfront for a professional to carry out only a survey, the service will not include the design of remedial work, nor include for solving any problems identified to be put right.
- If you appoint a *structural engineer* to design a property, an extension or a change to an existing structure, it is recommended that you confirm that this appointment includes any survey costs necessary to allow the design to be completed (including how many re-visits to inspect/survey will be allowed for). However any unexpected faults identified in the work may not be covered in the agreed design fee (for example, if rotten timber is identified in an existing structure).

Chapter 4

Engaging a structural engineer

4 Engaging a structural engineer

Selection

In the UK it is legal for anyone to call themselves and provide services as a *structural engineer*. Not all will be competent to do so and therefore it is important when choosing a *structural engineer* to check their credentials. It is strongly recommended that you take some time to investigate and confirm that any designer, including the *structural engineer* you approach to work for you, is experienced and has successfully completed projects similar to the one you want to undertake.

Track record

Individual *structural engineers* can have different areas of expertise and so it is perfectly acceptable to ask your prospective designers for details of similar work they have completed and to ask for references from satisfied customers.

Professional qualifications

The Institution of Structural Engineers (IStructE) is the most applicable professional body for *structural engineers* and is the only professional engineering Institution in the UK to examine potential members with a rigorous industry-leading formal written examination together with an interview assessment of experience, to ensure a high level of competence specific to structural engineering. Professionally qualified Institution members show their affiliation and grade of membership using the following designation after their name.

- FStructE (Fellow of the Institution)
- MStructE (Member of the Institution)
- AMStructE (Associate member of the Institution)

Whilst it is not compulsory, most members of the Institution will register to use the additional titles of Chartered Engineer (CEng) and Incorporated Engineer (IEng).

These are protected titles (similar to Lawyer, Doctor or Architect), and can only be used by individual engineers who have met strict assessment criteria.

When selecting a *structural engineer* it is recommended they are members of The Institution of Structural Engineers or are Chartered Engineers or Incorporated Engineers of another Institution and are able to demonstrate their competence as a *structural engineer*.

“ It is perfectly acceptable to ask your prospective *structural engineer* for details of similar work they have completed ”

Insurance

It is strongly recommended that your preferred professional advisor carries Professional Indemnity Insurance which protects against their legal liabilities relating to their professional services. As a customer, you are entitled to, and it is reasonable to ask, to see a copy of the

structural engineer's professional indemnity certificate of insurance and for confirmation that the monetary protection / limit of indemnity exceed the value of reasonable potential losses. The Institution of Structural Engineers' code of conduct requires all *structural engineers* who are affiliated with the Institution to formally advise a customer if they do not hold professional indemnity insurance.

Search for a *structural engineer* near you at istructe.org/building-confidence

Finding a structural engineer

By affiliation

FindanEngineer.com is a website hosted by The Institution of Structural Engineers that contains a comprehensive database of Chartered Structural Engineers and structural engineering practices across the UK. Only firms that have at least one qualified Member or Fellow of The Institution of Structural Engineers are registered, helping you to trust the reputation and quality of the companies listed.

By recommendation

Structural engineers can often be recommended by *architects/architectural designers, builders or building surveyors* and of course by other contacts you may have. You can check whether recommended *structural engineers* are members of The Institution of Structural Engineers at the following directory:

www.istructe.org/finding-a-structural-engineer/members-directory

Listed Building specialists

Maintenance and works on Listed Buildings is a specialist field that requires *structural engineers* to be familiar with the historic materials and construction techniques employed across the property.

The Conservation Accreditation Register for Engineers (CARE) identifies structural and civil engineers accredited for the conservation of historic structures. For more information, refer to: www.careregister.org.uk.

Alternatively, FindanEngineer.com catalogues many individuals and practices with specialism in historic structures.

Managing expectations and contract particulars

How you rate the success of your project may largely come down to your expectations. In an ideal world, your expectations would match those of your professionals. This is by far the best way of ensuring you're satisfied by the outcome.

Structural engineers: Can and Cannot;

Can ✓	Cannot ✗
Sign a contract, provide confirmation that their design and services have been performed with reasonable skill and care and a receipt recording the payments received and services completed.	Provide a guarantee.
Complete services with reasonable skill and care.	Warrant the quality or fit-for-purpose performance of the as-built/finished construction.
Complete inspections/surveys prior to works starting to gain information that will inform the design and reduce financial risk.	Eliminate risks outright of unexpected site conditions that may cause delay and/or additional work/fees.
Prepare information to support a Building Control application, and manage the application on your behalf. In Scotland, structural engineers can be Approved Certifiers of design.	Issue Building Control consent, negate the need for a Building Control application, nor free the property owner of their legal responsibility for obtaining Building Control consent.
Carry out inspections during and after building work to advise upon the correctness of the builder's work.	Police or take responsibility for the performance of the builder, nor be in all places at all times to inspect all aspects of the construction.

Building finish quality and energy efficient construction

The Building Regulations and Standards provide minimum criteria that must be achieved and you may wish to specify higher standards to meet your personal requirements. Your *architectural designer* will be able to guide you on many of these however it is important that your *structural engineer* is kept advised of your intentions since unwittingly you may find that the structural design and integrity has become compromised.

Warranties and certification

Designers provide a service, not a product. Hence warranties offered by your design professional are limited to reasonable duty of care and diligence, not guarantees of adequacy. Your *structural engineer* must never the less conform to the requirements of the appropriate Building Regulations and Standards. It is still possible however, that your building fails to gain certification if the building work has been poorly carried out, or if unforeseen circumstances infringe on the design in a way that the *structural engineer* could not have reasonably predicted.

Consumer rights

In paying for consultancy services, you are entitled to consumer rights set out by a number of Acts of Parliament. These apply irrespective of the contractual terms or warranties agreed.

Structural engineering is a professional service. Repeat business and recommendations are very important to *structural engineers* and it is therefore very rare for *structural engineers* not to give satisfactory service to their customer.

Disputes are best avoided by being very clear on the scope of services the *structural engineer* is being commissioned to undertake from the outset, and to formalise this in writing.

In the very rare event that you are unhappy with the services provided, the first thing you should do is discuss the issues with your *structural engineer* and give them the opportunity to explain their actions and propose a solution acceptable to both parties. If you remain unhappy with the service you should record this in writing to the *structural engineer* and follow up, again in writing, to confirm any discussions and agreements. In this way you have a formal record of the issues should you need it.

Professional conduct

You can be assured that individual *structural engineers* affiliated with The Institution of Structural Engineers are required to adhere to a professional code of conduct, details of which are on the Institution's website.

For further information on the Institution code of conduct, visit istructe.org.

Note: persons acting as *structural engineers* who are not affiliated with either The Institution of Structural Engineers or an alternative professional body may not be bound by any code of conduct.

Copyright

Copyright of designs produced by a *structural engineer* (including drawings, reports, etc.) typically belong to the *structural engineer*, though other designers, the builder and you as the customer/property owner should each be allowed to use the material for purposes relating to the property (e.g. future extensions and/or maintenance work).

Budgeting for a *structural engineer*

Structural engineers charge for their time at an amount that covers their wages and overheads. Additionally they may charge you for incidental expenses (sometimes called disbursements). These charges will be for activity specifically in connection with your project for example travelling costs and costs associated with making applications on your behalf.

The cost of the structural engineering services relative to the overall project cost will vary widely depending on the complexity of the work. On smaller projects such as modifying existing buildings, fees can appear relatively high compared to the build costs since the engineer's work can be disproportional to the physical construction required.

Your engineer wants to increase their fee. Why?

At the start of your project a *structural engineer* will estimate the cost of work based on the information made available. It therefore pays to take the time to get an informed quote upfront and to understand what is included and, **equally as important, what is not included** in the quote. Having a clear understanding of the *structural engineer's* brief and how they have priced this to build up their fee is essential to controlling costs.

Provide as much information as you can when requesting a fee quote from a *structural engineer* and any time you are unsure; ask for their professional opinion in describing the different services they can provide. The target should always be a mutual understanding between you and the *structural engineer* of what is being provided.

Unforeseen issues can never be entirely ruled out. This is particularly true for work being constructed in the ground. Similarly, the older the property the more likely it may be that you encounter something unforeseen. In such circumstances it would be reasonable for the *structural engineer* to be paid for additional work necessary. Such extra work may include redesigning aspects of the project or undertaking more or totally new designs to accommodate the issues that have arisen.

It is also reasonable for the structural engineer to be paid for additional work resulting from changes you have made to the original brief after having accepted a quote.

It is possible to ask your *structural engineer* (and other members of the team) to quote for their services on the basis of a 'fixed fee' taking into account the risk of encountering unforeseen issues. By accepting extra risk you can expect your service provider to increase their quotation however you may consider this to be a small premium to pay compared to the potential impact of increases in fees.

“ A successful project is one that will meet your needs and expectations, often in terms of cost, quality, timing and giving you the outcome you want ”

Search for a *structural engineer* near you at [istructe.org/building-confidence](https://www.istructe.org/building-confidence)

Sources of further guidance

Visit the Institution's Building Confidence website for sources of further guidance and references.

The small print

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