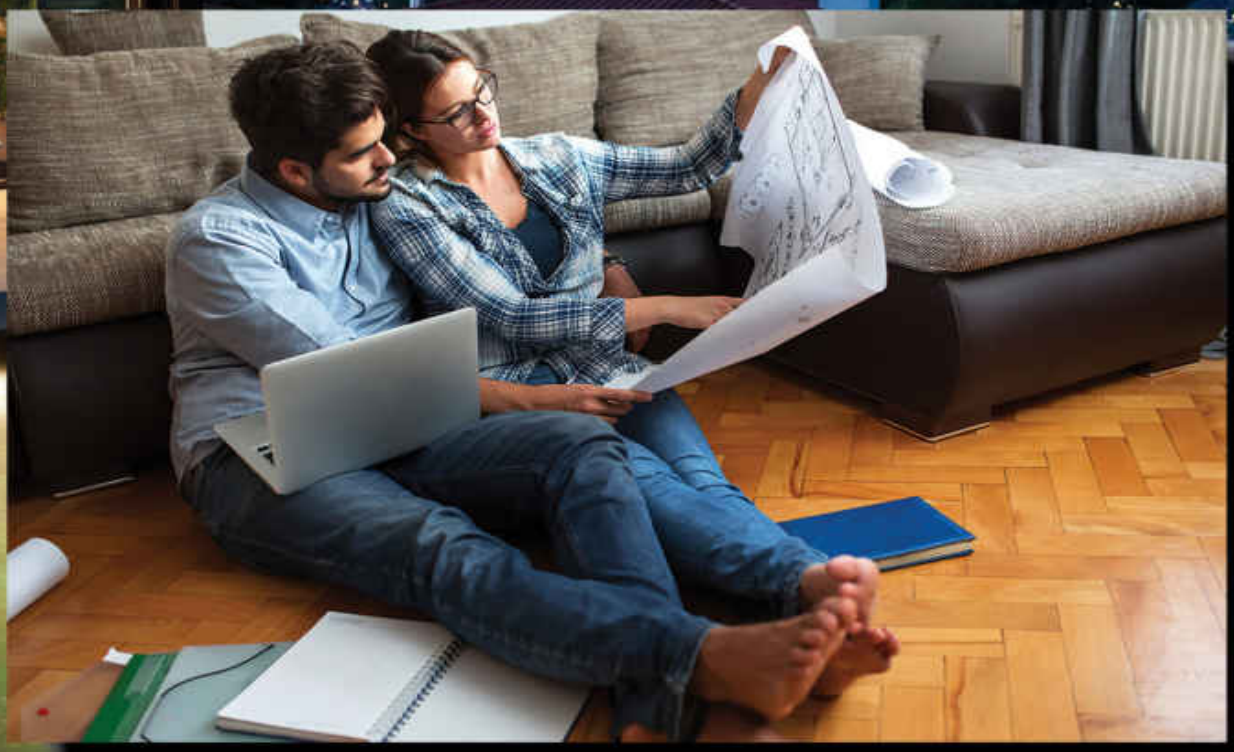
An Introduction to Building and Renovating Houses

Volume 2
finding your ideal property and designing your dream home



Paul Netscher

An Introduction to Building and Renovating Houses
Volume 2 – finding your ideal property and designing your dream home

"Valuable advice to ensure that you purchase the right property and build the right house for you and your family."

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Legal Notices

It should be noted that houses are varied, using different materials and employing diverse construction methods. Countries, states, counties and cities have different regulations, restrictions, codes and laws. To complicate matters further these laws, acts and restrictions are continually evolving and changing. Even terminologies vary between countries and contracts, and may not be the same as those included in this publication. Technology is continually moving. In addition, we're all different and what I might think is a perfect home, or an item I think is important in my house, may not be something you would consider. It's therefore important that readers use the information in this publication, taking cognisance of the particular rules that apply in their region and to their project, and adjust to suit their own personal requirements.

Each house has its own sets of challenges and no one book can cover all the steps and processes in every project. Some of the author's personal opinions may not be pertinent to you, your contract or your house. Readers should undertake further research and reading on the topics particularly relevant to them, even requesting expert advice when required.

Therefore, the author, publisher and distributor assume no responsibility or liability for any loss or damage of any kind arising from the purchaser, or reader, using the information or advice contained herein.

The examples used in the book should not be seen as a criticism of people or companies but should rather be viewed as cases which we can all learn from. After all we've all made mistakes. Any perceived slights are unintentional.

Cover layout by Clark Kenyon, www.camppope.com

Preface

Most of us would like to live in a nice family home where we can be happy and carefree. A home that's just right for us and our family. That has all the space and some of the luxuries and convenience we desire. How do we reach this goal? Why not renovate our house, or maybe build a new home from scratch? Home makeover shows and do-it-yourself magazines make it all look so easy.

With these thoughts in mind many excited homeowners leap straight into their home renovation and home construction projects. It seems so simple – what could go wrong? Unfortunately all too frequently things do go wrong. Projects don't turn out as expected – why doesn't our new house look like the images we envisaged before we embarked on the process. The project takes for ever to finish and we live in a building site for months – even years. Then there're the family arguments over paint colours, types of light fixtures, carpet styles and colours – there seem to be an endless range of choices. Furthermore, there are frequently arguments with the builders when things don't work, roofs leak, damp appears in the house, cracks in the walls, and more. Budgets are blown – often causing financial stresses, family fights and even the project remaining unfinished. In the worst case banks repossess the house. How can our dream home turn into this nightmare?

But building or renovating a house doesn't have to be a nightmare. Sure, it can be stressful sometimes, it can involve hard work, but if planned properly it should be a very rewarding process, one that provides your family with a wonderful home for many years. A final result that enhances your financial situation. A home that's the envy of your friends, family and neighbours.

I want to make your building project a success. The path to success starts long before construction work begins on your house. Let me help you as I take you on the exciting journey through the various stages in the process that ends with a renovated home, or a new house, that you and your family will love and enjoy for many years without having broken the bank.

I'm not going to make the decisions for you, nor am I going to tell you what you must do, but I'm going to give you all the information so that you can make informed decisions which are best for you.

Acknowledgements

A special thanks to the readers of my previous books who continue to inspire me to write with their great reviews and comments.

I’ve been fortunate to have had a successful career in construction thanks to the support of my team and the help and advice I received from numerous colleagues. My experiences have inspired me to pass on my knowledge and experience to others. Thanks to everyone that has taught and helped me over the years.

Thanks to Sandra for her patience and support.

Contents at a Glance

“You owe it to yourself to design a house that you’ll be proud of, one that will adapt to your changing needs and one that won’t unduly stress you financially. You owe it to your family to design a house that’ll be functional and practical, one that will provide them safety and comfort. You owe it to your neighbours to design a house that won’t negatively impact the value of their properties, a house that will fit into the neighbourhood. You owe it to future owners to design a house that will be a quality product. You owe it to the world to design a house that will make the best use of resources, that’ll have a light footprint on the world. Get the design right and you can simplify the construction process. A good design will provide you and your family with years of comfortable and happy living.”

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Introduction

You've probably watched many home renovation and construction shows on television and you're all excited about building your designer home. It all looks so easy. Sure, some people made mistakes on the show, but it all ended up fine in the end! What could go wrong?

Maybe you've seen a nice home in a magazine, or a television star's mansion. Possibly the family is outgrowing your current home, or maybe your home is falling apart and in need of repairs. You could even be ambitious and ready to build yourself to wealth with an investment property. Whatever it is, first pause and read this book.

Building a house or renovating your home isn't as simple as it looks on a home make-over show. Maybe a few do-it-yourself books can help, but it's more than just construction. It's about planning the project from the beginning – doing your homework properly. You must decide what you need, where you want it, and how much it will cost. If you can afford the project, then you require the right team, and you have to manage the process right to the end of the construction phase. Then when construction is complete you should understand your rights and obligations. A wrong step along the way could result in additional costs, delays and possibly even a house that you're not happy with.

Unfortunately, when it comes to our houses there's so much emotion attached. Often this emotion drowns out any sense of caution or reason. It's easy to get carried away and suddenly there's an extra bedroom, rooms become bigger, more expensive fittings and fixtures are selected, changes are made to the design halfway through construction, and more. All adding to the costs and delaying the project, and worse still, possibly even ending with a house that's such a mixture of ideas and adaptions that it no longer fits the original purpose of the project or your requirements.

Equally important is to have realistic expectations, but also expectations which your builder and designer understand and can deliver on. Far too often dream houses and upgrades turn into disappointment when they don't turn out like we imagined or wanted them to be. Sometimes your dreams and expectations are unobtainable, but this is often more about what you expect, rather than what's possible. Those colour combinations or design ideas may seem wonderful in your mind or on paper or a computer

screen, but when they're a reality they could look awful. Sometimes you need to take a step back, and consider what's logical and reasonable, and of course what's financially feasible.

Regrettably we can't all have that magazine cover house, or the celerity's house, but that doesn't mean you can't have a house which you can enjoy, and which fits your family's needs and lifestyle. Anyway, do you really want, or need, a house that's fit for a celebrity? It's vital to remember that you have to live in the home. That it must be suitable for your family. Of course, that it's also practical and affordable to live in.

Building or renovating a house should be exciting, it will be challenging, but it will end successfully if planned correctly. Building a home is going to be one of the largest investments you make – both emotionally and financially, so it's important to get it right.

There're also some of you who won't be building or renovating a home for your family, but will be doing it as an investment property, to lease or rent, or to sell at a profit. In these cases it's even more important to put your own emotions and tastes aside. You need to know what the average tenant or buyer wants. Frequently investors become so focussed on reducing costs that they overlook the needs of their tenants or buyers. It's all very well building something cheaply, but it will be very costly if no one wants to rent or buy the finished house. It's equally imperative to look at other products on the market, and those in the planning and construction phase. Far too often the housing market is flooded by 'cookie cutter' houses, tacky little boxes, too many identical houses or apartments which don't differentiate themselves from the competition in an oversupplied housing market. So study the market carefully to understand what buyers and tenants are looking for, and what's available to satisfy their demand.

Of course housing comes in a wide variety of products, from low-cost housing, average suburban houses, through to luxury homes. Sometimes these homes have minimal garden space, while others can have sprawling landscaped gardens, or they are even on 'lifestyle blocks' or mini farms. Houses could be freestanding, semi-detached, they may be part of a complex or an estate which is governed by a set of rules, or they are an apartment. What you choose should fit your family's planned lifestyle and budget. Not everyone wants to be mowing the lawn and working in the garden on weekends, but on the other hand, you may not want your children and pets cooped up in an apartment. We're all different, and you should try

and do what's best for you and your family within the constraints that you live in.

It's important to note that cheap or low cost housing should never be an excuse for poor quality construction. You should never sacrifice construction quality to satisfy budgets or time constraints. Your house is a big investment and you certainly don't want it falling apart after a few years, nor do you want the added costs of ongoing repairs and excessive maintenance. Worse still, you don't want your belongings damaged when a roof leaks, maybe even blows off in a storm, and you certainly wouldn't want you or any of your family injured because of shoddy or non-compliant work. You can certainly reduce costs by choosing cheaper finishes, reducing some of the amenities, or by making the house smaller. But, all products must be compliant with the applicable specifications and regulations, and they must be installed correctly.

There are different rules, national, state, county, local government, and in some cases even estate rules, that could dictate what you can build, what materials you use and even the construction methods that should be used. There're sometimes endless permits and permissions that are required, and these vary from region to region and city to city. Failing to get these, or to comply, can lead to expensive mistakes and delays.

You should also consider the ongoing running and maintenance costs of the house. Houses cost money to run and maintain, this includes water, gas and electricity bills, maintenance costs, which could include painting, repairing broken equipment and general repairs of items that have become worn or loose, and then there's the cleaning and gardening bills. These costs are important to consider during your planning stage because you probably don't want to be repainting your house every few years, or paying sky-high utility bills, or ripping out the air-conditioning system because you can't get the spare parts to fix it.

The process of building or renovating a house starts at the beginning where you decide what you want, where you want it, when you need it, how much you can afford and how you're going to manage and construct the work. Without understanding these things it's very difficult to proceed to the next stages, which is selecting your team, designing your house and constructing it.

It's important to gather ideas, to list the 'must haves', the 'would like to have', and the 'definitely don't want' to be incorporated in the house.

These decisions shouldn’t be based on spur of the moment whims but should be carefully thought through. You’ll probably have to live with your choices for many years or incur additional expenses to change them, so take the time to get everything right. Make lists as you go and tick off items as they’re included, and cross off items that aren’t an issue anymore. Always retain in a file kept in chronological order all your lists, thoughts and ideas, since it’s useful to go back and refer to them to ensure that your original concepts and ideas have been met, or to understand why there were changes to arrive at your final design – were these improvements, a necessity, or just a ‘nice to have’?

Spend time on designing the house, then carefully reviewing the blueprints or drawings, before construction starts. Ensure that the design has incorporated all of your needs and requirements (where feasible). Making changes during construction will be costly and cause delays.

Good planning is key to a successful project. The more planning that goes into the project before work starts, the more likely that the project will be a success.

Constructing a new house involves hundreds of decisions. Each of these decisions could have a time and a cost associated with them. You’ll have to live with many of the decisions for years. So make your decisions wisely, considering all the information at hand. Of course this doesn’t mean you should procrastinate, which could be as costly as making the wrong decision. Rather take a steady logical approach.

Never hesitate to engage experts for advice, or when you need help. The costs of using an expert may seem big, but that cost must be viewed in the context of the overall project cost, and the risk of getting something wrong without their advice. But if you’re confident in your own knowledge, expertise and abilities, then by all means go it alone.

Of course it’s pointless designing and building a fantastic house if it’s in the wrong area, maybe an area that’s unsafe, far from schools, or an area that has poor infrastructure. You don’t want to spend a fortune on a house that you don’t like because of its location. Real estate agents always say location, location, is the most important thing when buying a property. And they’re right. So what is the right location? Well that depends on you, your family and of course your budget. We are all different, and the location that others find attractive might not be for you. So don’t be swayed by other’s opinions, sure listen to them, but ultimately you must make the right

decision for you. After all it’s pointless buying an expensive property in an area that your friends and family suggest and then you have no money to build a decent house. But, on the hand be sure you aren’t buying a cheap property which you won’t like once your house is finished, or a property that will be expensive to build on.

Often we embark on expensive renovations of our existing house. Are the renovations really necessary, or could we make more simple and less costly changes for a similar result. But more importantly, are we really improving the house and are we changing the things we don’t like and adding things we need? Possibly we are throwing good money after bad. Some houses have features which we can never improve on, while sometimes a cheaper option is to sell the house and buy another more suitable house. Care must always be taken when planning a renovation that we’ve considered all the costs because often there are hidden costs which only come to light during construction, wrecking our budgets. When renovating always consider the final style of the house and ensure that the renovations blend in harmoniously, and that the house doesn’t end up feeling disjointed and a hodgepodge of ideas and styles with an awkward layout.

Notes on using this book

In general I’ve used the word house, but this could be any dwelling, such as, an apartment, townhouse or semi-detached unit.

Terminologies vary between countries. Please refer to the glossary at the end of this book for the meaning of the terms I’ve used.

This book doesn’t refer to specific permits, licenses or permissions. These vary between countries, states and even districts. But furthermore, they’re also revised from time to time. It’s important that you refer to local legislation and ask for expert advice to understand the requirements that apply in your district at the present time. Even if you’ve previously been involved with construction in your area it always pays to check the current rules, ensuring they haven’t been recently revised.

In this book I discuss things you should consider when selecting a property. Now obviously you can’t satisfy every criteria, and nor is it possible to accurately predict the future. So look at things which are important for you. Consider how the property could impact construction costs. Do your research and homework to select the best property for you and your family. A property where you will be comfortable, safe and happy.

Whether designing a brand new home or planning on renovating or remodelling an existing home there are multiple options and things to consider. Not all the items I discuss will be of interest or pertinent to you. But the design criteria I discuss should form a valuable framework and checklist of what to consider when designing your home. Of course most professional architects and home designers have invaluable information and advice, but it will help them design your dream home if you have an idea of what you want and don't want, and a concept of what sort of home you would like to live in.

In the final chapter I consider a few simple renovation and design ideas which can be implemented at a modest cost, but which will make a huge difference to many houses, adding to both the value of the house and your enjoyment of the house.

I've included a few simple stylised sketches which aren't to scale to illustrate some concepts which I wasn't able to adequately explain in words. I've exaggerated some items on the sketch to highlight particular points.

In my other home construction book *'An Introduction to Building and Renovating Houses – Volume 1, Hiring Contractors, Managing Them and Finishing Your Home'*, I discuss the various parties you'll encounter when building and renovating your home. I look at some common construction processes and what you should look out for. There's a chapter on getting ready for construction. I briefly discuss what you should consider if you're doing the construction work yourself. There's a chapter on choosing your contractors, plus a chapter on contractual issues and one on financial issues. I also discuss managing your contractor and project, then there's a chapter on completing the project successfully, then finally there's a chapter on avoiding common construction problems.

Who am I

I have 30 years construction experience which includes multimillion dollar projects such as stadiums, shopping malls, casinos, roads, reservoirs, bridges and houses. But importantly, I've owned and lived in several houses. I've employed contractors to renovate and repair some of these. In this time I've seen many mistakes which should have been avoided. Yet, I've also been exposed to many good ideas and excellent construction work. I've also made my own errors and learnt from them.

I hate seeing bad construction projects, those of poor quality, where people have been injured, which were over budget and in some cases didn't

satisfy the owner's requirements. I want to make every construction project successful – as they all should be. To pass on my experience and knowledge I've written several construction books. *'Successful Construction Project Management: The Practical Guide'* is aimed at contractors. *'Construction Management: From Project Concept to Completion'* is for project clients and owners. *'Building a Successful Construction Company: The Practical Guide'* is for owners and senior managers of construction companies. These easy to read books have received good reviews from readers, including:

"Great reading. It's a real case of where, what and how to construct, integrated with why, when, where. An easy manner of writing is making content understandable for construction managers…"

"Excellent writing, very useful and all round good read."

"This book is fun to read and full of examples of what to be aware of with project management. His stories are insightful and educational. His style of writing is fun and useful."

"It's also good to learn from someone who made mistakes, takes blame, which made the book real. He presents the information to cover everything in an easy flowing read."

"Really a good practical guide"

"Great book, offers excellent insight"

"*Well written and easy to read!"*

I want to empower you to make the right decisions – right for you and your family. I want to ensure that your home build project is a success. The home renovation and building process starts with the right property and then the right design. A property and a design that suits you and your family and which won't break your budget leading to financial stress. Get these right and your dream home is well on it's way. I hope this book leads you on the path to home building success.

Chapter 1 – Early Decisions

Generally when planning a house you're faced with a number of conflicting forces which are, what you desire or want, what you actually need, what you can afford, what can be done or is allowed, and of course with a new family home you also have the opinions and needs of your partner and even the children. Seldom do these align perfectly so most houses end up compromising on some of these items. For example, your family may be expecting another child and need to add another bedroom. At the same time you might want another bathroom, to renovate the kitchen and build another garage. However, you may only have sufficient money to build the extra bathroom and bedroom, but, possibly you won't have sufficient space on the property for the additions. Somewhere there'll need to be compromise.

Unfortunately, sometimes this compromise can lead to a bad house where the compromise results in one force dominating the others – for instance, affordability drowns out everything else, so you end with a house that's of poor quality and doesn't satisfy any of your other needs or desires.

Of course, there are usually other factors that come into play which also affect the final outcome. If the property is an investment property, to be sold or rented, then it's important to consider what buyers and renters want as well as the available existing stock. If you're planning to execute most of the construction work yourself then the amount of time you have available should influence the size and complexity of the project. The available materials, access routes to the property, as well as the site topography and existing vegetation will all influence decisions. In this chapter and the following chapters we'll look at many of the considerations that can impact the final result of your new house.

It's important to take a pragmatic approach to planning projects. Projects that are rushed, poorly considered and ill-conceived can be expensive disappointments. It often leads to a house that you no longer want to live in and can't find a buyer for. In fact some poorly managed projects that are started with great excitement can have far wider repercussions, even resulting in bankruptcy and family break-ups.

What you think you want in the beginning should never be cast in stone. There may be reasons why the original envisaged project isn't

feasible, or not the best solution. By necessity projects should adapt and evolve as more information is considered. Indeed, it may even be wise to cancel the project should it become too expensive or difficult. Even if you've spent money already, never be scared to cancel a project, or to move it elsewhere, when it becomes apparent that it's not right. It's far better to lose a small amount of money than end with a house that you're not happy with, or one that's going to cause you financial stress. Certainly, if you do all the preparatory homework and investigations as suggested in this book you will, if necessary, end the project before you've incurred too many costs.

But changes made to the project by you, your designers or contractor, could indeed result in a project that's better, cheaper to construct, less expensive to maintain, or one which has more amenities for minor additional costs which are still within budget.

Although our first thoughts and project concept shouldn't be cast in stone, and it may be necessary to deviate from these in the course of the project execution, it's important to always refer back to those first concepts and ideas. Regrettably, as projects evolve, in the excitement of new ideas, it's easy to forget what you wanted and needed in the first place, then you end with a house which doesn't actually satisfy what you were originally after. So, as changes occur to the project, always understand why those changes happened. Did the changes improve the project, were they 'nice to haves', maybe spur of the moment whimsies, or were they unavoidable? If the changes are unavoidable and they result in a project that isn't suitable for your needs, then you may have to make the hard decision to cancel the project, or develop alternative strategies and solutions.

What do you want? What do you like?

Before designing that new house or additions, it's wise to sit down and decide what you want. Do you want a house or an apartment, how many bedrooms, the number of bathrooms, what size rooms, do you need a garden and how big, do you require parking for vehicles and does this need to be undercover and secure, where is your desired location, what style would you like, and what kind of fixtures, fittings and finishes are you looking at?

It's useful to visit houses that are for sale – even if they're in the wrong location or out of your price range. They frequently offer opportunities to gather ideas – to see what you like and don't like. Even if you don't like a

house don’t simply rush out, but take your time looking around. Understand why you don’t like the house – are there particular features, styles or layouts that put you off? Are there some features that you do like – what and why? Always keep in mind the various prices. Understand why some houses are more expensive than others. Know what can be bought with your budget. You may want to live in a multimillion dollar dream home that’ll grace the cover of popular home and garden magazines – yet for most of us this is a dream that isn’t going to happen.

Look through house and home magazines to obtain ideas for interior finishes. Visit display showrooms that offer various options for tiles, lights, bathroom fixtures and kitchens. See what can be achieved so that you and your family can live happily without breaking the bank.

Scan the internet for ideas and styles that you like. Always try and understand why you like something, or why you don’t like it.

Take photographs, make notes, collect brochures, gather pictures from magazines and the internet. Create folders of ideas.

What do you need?

Now this is where the voice of reason needs to step in.

There’s often a competition between what you want and what you need. You may want an expensive sports car which, however, could be impractical if you require the car to take the family on vacation. The same goes for your house. We usually all want the best, state of the art, iconic, architect designed structures and yet we probably only need the basics. Though, you mustn’t confuse the word basics with producing something of poor quality, or of skimping on costs so you have a house that’s not fit for purpose. To go back to the car analogy, you may not need a sports car, but you’ll need a car that’s reliable, safe, that can accommodate the family, is comfortable and which retains resale value when you decide to sell it. So too with your house, you want somewhere that you can enjoy living in, that will satisfy your and your family’s requirements, where you will be safe, and a house that will be appreciated by others when the time comes to sell and move on. And yes, inevitably you will eventually sell and move on.

Of course there are also some of you thinking of downsizing, building a smaller house, perhaps even moving into an apartment. Again, you need to consider the practicality of this. It may seem like a good idea, and it may appear to be a solution to having a smaller footprint on the environment and the planet. Yet, is this really practical for you and your family? Can you

really downsize? Will you be happy living in a small house or an apartment in a few years' time? Regrettably many have moved to small houses only to move out after a few years when they found that it wasn't to their liking. Certainly many people are happy living in a small house – but will this suit your lifestyle?

Some projects are started on a whim – you saw something and thought it would look nice. How often have you bought an item of clothing only to find when you got home that it wasn't the right size, or wasn't an item that you needed? Our closets are filled with items of clothing that have never, or seldom, been worn. Unfortunately building or renovating your house costs lots more money and can't simply be changed when you find it's not suitable. You can sometimes return an article of clothing because it's the wrong colour or size, but, increasing the size of a room, or ripping out floor tiles because you don't like their colour isn't so easy, and often costs lots of money, if it can be done at all. So you simply shouldn't one day get out of bed and decide you're going to renovate and extend your house, then immediately call a contractor, or worse, get out the tools from the shed and start smashing down walls.

It's therefore important before embarking on a new project that you list all the items required from the project. This would then normally be the minimum set of requirements for the house.

Indeed, you may find that your current home already fulfils all your family's needs and there's no need to read any further. Maybe all your house needs are a few minor repairs and a new coat of paint. Perhaps even throwing out that accumulated junk, putting in some additional storage, rearranging the furniture and replacing items that are unsuitable could be the simple solution – see Chapter 6 for ideas to easily improve and add value to your house.

It's always important to also consider your future needs, which might be characterised by short term and medium term needs. So for instance, if there's a new baby on the way you may need that extra bedroom quite soon. If you're planning to have more children, then maybe you should be considering more than one extra bedroom. On the other hand, if your children are about to leave home, your current house which could seem very crowded right now, may in a few years suddenly have surplus rooms, so would it be wise to be adding an additional bedroom that may only be needed for a year or two.

What does your family want and need?

Embarking on designing and building a new house or renovating your home is going to be even more difficult if there isn't agreement with your partner. Thousands of decisions will have to be made. Establishing some common ground as to the size, general layout, overall architectural theme and the location is essential. Failure to discuss your thoughts and to understand your partner's point of view could lead to one of you being unhappy with the final product, or even both of you. Not agreeing principles as the design progresses could lead to designers and contractors being pulled in two directions, inevitably leading to changes during construction which will be costly. Even more costly will be changes after construction is complete. Understand that some compromise from both sides will be necessary, but always ensure that these compromises aren't going to result in an architectural mishmash of ideas that looks terrible and doesn't satisfy anyone. So, at an early stage visit homes together, look at the same magazines and review house plans. Narrow down the choice of plans and styles to those that you both like – which might not have been your first choice. Where you disagree with your partner, argue the case logically with the pros and cons. Be prepared to change your mind if you're wrong, or make adaptions where necessary.

You may involve the children in some of the processes but shouldn't be too side-tracked by what they want. Yet, it's important to consider their changing needs and how the house can be adapted to fit these needs. So, a home for children under five could be different to a home for children between five and thirteen, while older children will have different needs. It's important to provide them space which can be changed and adapted. Space to play, space to study and space to entertain friends.

Taking account of your lifestyle and tastes (and your family's)

Your lifestyle will dictate many of the requirements of your house.

- Do you entertain lots? If so you may want a bigger kitchen, larger entertaining areas and possibly you may want to separate the entertaining areas from the bedrooms and the kids' spaces.
- Is there a big family? This would dictate the number of bedrooms and bathrooms. But, an extended family may mean regular family gatherings which would require larger dining and sitting areas.

- ➢ Do you like the outdoors? You may want a large outdoor sitting area so you can enjoy the outdoors and probably a bigger garden.
- ➢ Do you like gardening? Again this would dictate a larger garden, possibly space to grow vegetables and even plant fruit trees.
- ➢ Do you enjoy sitting in the garden?
- ➢ Do you travel lots and want an easy care house and small garden?
- ➢ Do your children have friends visiting often? You could consider separate lounges for the kids to entertain their friends.
- ➢ Do you like cooking? You might want a bigger kitchen with all the top appliances.
- ➢ Do you like long relaxing baths?
- ➢ Is privacy important? Privacy includes what the neighbours can see as well as people from the road. But privacy even includes the layout in the home. Will you have a quiet place to call your own, a place to escape the rest of the family when you need to?
- ➢ Do you need your own space to do work? A study or office to store papers and documents.
- ➢ Do you have visitors or family that stay over? Do you need a spare bedroom with easy access to a bathroom?
- ➢ Will you and the family use a swimming pool?
- ➢ How many cars do you have? Do you want them parked undercover?
- ➢ Are you a hoarder with trinkets and ornaments? If so you'll need space for shelves or even display cabinets.
- ➢ Do you have an art collection? You'll need wall space then, and the right lighting.
- ➢ Do you have lots of clothes? If so you need bigger cupboards or closets. Maybe you require these to have a particular size and layout to take shoes, lengthy garments and stuff that folds up.
- ➢ Do you like simple clean lines?
- ➢ Do you have a collection of books? If so you'll need bookshelves.
- ➢ Are you a tidy person? You may want lots of cupboards with doors so that stuff can be packed away out of sight.
- ➢ Do you like the latest technology? If so you'll want your home wired for the latest smart technology.

- ➢ Do you want to feel part of the neighbourhood, or don't you want to see or hear the neighbours?
- ➢ Do you like the latest fashions and styles, or are you more of a vintage person?
- ➢ Do you have a big wine collection? If so you may want a wine cellar, or certainly a cool spot to keep your wine.
- ➢ Do you like listening to music? You might want a sound system built into the house.
- ➢ Is protecting the environment important to you? You may want to use recycled and local materials in your house. Also protect the local vegetation and incorporate water saving and water collection and recycling systems. You would design the house to be energy efficient with solar panels.
- ➢ Do you like pets? What pets? How important are they in your life? Most dogs will need an outdoor area. Areas inside the house where your dogs will be need to be easily cleanable. If you have birds or fish you'll need place for their cages or tanks.
- ➢ Do you use public transport? If so you want a property that's situated close to public transport.
- ➢ Do you work from home? You may require a separate office, even served by a separate entrance so business visitors don't have to go through the house to get to the office.
- ➢ Do you, or a member of the family, need space for a hobby?

Architectural style – what does it all mean?

A house's style is made up of a number of different factors, which include:

- ➢ The internal architectural features.
- ➢ The internal fixtures and finishes. These include the type of floor finishes (ceramic tiles, clay tiles, carpets, timber or parquet flooring), wall coverings and colours, type of doors and door frames, kinds of light fixtures, cabinetry in the kitchen, and bathroom taps and fixtures.
- ➢ The size, shape and arrangements of the rooms.
- ➢ The shape, design and size of the windows and the frame materials (timber, aluminium, steel, etc).

- ➢ Furniture, which includes window treatments (curtains, blinds, shutters).
- ➢ The external architectural features.
- ➢ The shape and design of the roof, including the roof covering (tiles, shingles, tin, concrete).
- ➢ The garden layout and the type of plants.
- ➢ The external proportions of the house.
- ➢ The aesthetics.

These various aspects should combine to present one common style through the whole house. Failure to combine the elements correctly, or mixing different styles through the house, can provide a disjointed patchwork of ideas and components, with no flow and little compatibility.

We all have different ideas on style, and what one person likes another may hate. Various styles come and go, and what's 'in' this decade may be despised later. But equally, what was demolished last decade may be cherished now.

Of course not all styles are suitable for every environment or climate. Nor are they suitable for everyone's lifestyles.

But, the design of a house conveys a mood and an identity. It can be warm and inviting, or it could be cold and antiseptic like a hospital. It could be filled with family homeliness, or carry hints of nostalgia for a forgotten past. It could reflect the history of the neighbourhood, or it could feel out of place.

Sometimes external style choices (which could even impact interiors) are dictated by the rules of the estate which may have strict architectural guidelines, some areas may have heritage listing which dictates what can and can't be done.

When renovating a house you're often partly locked into a particular style already, and changing the current style to one you prefer may entail expensive modifications to the existing building structure. But, sometimes style changes can be more easily made by simply adding a few additional architectural features and elements and changing fittings and fixtures. However, a badly designed and planned renovation can destroy the style of a house. Addons can look cheap and out of place if they haven't considered and fit with the existing architectural style.

Even the site for the house could influence the style. Narrow properties will dictate the outside features, while small sites will dictate that the house

must be multistorey. Existing trees which you'll keep might not suit some styles, while steeply sloped sites could preclude others.

There are numerous architectural styles which can vary in name between different countries. Of course you don't have to follow a style in every detail, and you could choose your own style. However, it's important to be consistent, keeping the various elements and rooms together. Never let your style choices detract from functionality, and nor should they add unduly to construction and maintenance costs. Also, avoid overcrowding the style by trying to incorporate every element of a particular style into your house. Indeed, sometimes a little subtlety can work better.

Look through magazines and visit houses for sale and see which styles appeal to you. Understand what the appeal is, and how the style has been brought together using the various elements, the colour choices, layout, doors, windows, details, furniture, fittings, finishes and fixtures. Decide what style best suites your family's needs and lifestyle.

Consulting with an architect and/or an interior designer can help interpret and clarify your style choices.

What do you want your house to say about you?

Why build a new house?

Building a new house means that you have a blank canvas and you can usually build exactly what you want, providing you have the necessary budget and the building meets the codes and local planning laws. It allows you to design a home that best suits your and your family's needs. One that takes account of your current needs and considers your future requirements. You have the opportunity to create spaces and décor that matches your lifestyle. It's a chance to build a contemporary home incorporating the latest technology and innovations. You can choose the quality and type of materials and finishes, from paint colours, bathroom fittings, carpets and tiles. You can make your house as green as you wish – not just the colour, but rather creating an environmentally friendly home. (See Chapter 4.) Building a new house usually means that everything in it is new and products and materials are covered by warranties for a few years, which should mean that your maintenance costs will be lower.

New houses are typically more energy efficient, resulting in cheaper utility bills.

Building a new house is also often cheaper than doing a renovation. However, to build a new house you either need to buy an undeveloped piece

of land, or you must demolish an existing house to make way for a new house (which is often expensive, unless the old house is a wreck and didn't add much to the value of the property), or you have to create land by subdividing an existing property which already has a house on it so that the unused portion of land can be used for your new house.

In most cities vacant blocks of land are usually found further from the city centre. Many of the available building sites may be in areas where infrastructure is still being developed, which could mean that shops, schools, other amenities and even transport networks haven't been constructed yet. So building a new house may not always be feasible.

Why renovate an existing house?

Sometimes there isn't land available in the area you desire to live so you have to consider renovating your existing home. In addition, buying and selling property has other costs, such as agent's fees, transfer duties and taxes, removal fees and so on.

Often you really like the house you live in, or you like the neighbourhood, but just need to improve it slightly, add an extra room or bathroom to make it more liveable, or make some changes to modernise it.

Some people actually make a good living by purchasing older properties at a reduced price, and then renovating them so that they can be sold at a price which exceeds the purchase price and the renovation costs.

It should be noted, that even if you decide on an option to renovate or build new, you should always be open to changing your mind if the chosen path becomes unviable or too expensive.

The inconvenience of renovations

Renovating a house that you're living in often results in you and your family having to endure inconvenience.

It's important to understand these impacts and take them into consideration when planning your renovation, possibly even selecting construction methods which will be quicker, thus reducing the time of inconvenience, or, planning the renovations so that they'll have the least impacts.

What can you afford?

It's vital to understand how much you can afford. It's pointless pursuing a project and incurring costs when it's hopelessly too expensive for you right now. It doesn't necessarily mean that you'll never build that dream home, nor does it mean that you can't build a house now. Rather, it

may mean delaying your project, possibly looking at alternative methods of finance, considering other construction techniques and materials, or starting the project on a smaller scale knowing that you'll add to it and make modifications as time and finances allow. It could even mean locating your house in an area where land is cheaper, or where building costs are lower.

To calculate what you can afford you need to know what your earnings are after tax, what your monthly living costs are and what you can afford to pay each month towards the new house. You can also source additional funds by selling assets you own, borrowing money from banks, or even borrowing money from family.

Visit financial institutions to see how much they'll loan you. This will often depend on the current economic times, your earnings and expenses, what you can use as security against the loan and how much deposit or money you can put into the project. Generally banks won't loan more than 80 percent of the value of the new house and they'll often want you to give them security of the value of their loan.

Unfortunately, far too often people take on building projects which they can't afford. This leads to houses that can't be finished, stress, marital problems, and in some cases people have lost their homes which have been forfeited to banks.

It's always important to understand that circumstances sometimes change, people lose their jobs, sometimes another child comes along unexpectedly, interest rates on loans increase, property prices decline (which might mean the property you're borrowing against is worth less and so the lending institution will loan less than originally envisaged) and people become ill. So always be cautious, making sure that there's a reserve if something does go wrong, or conditions change.

How much will it cost?

How much will your house cost and can you afford it? This is often as far as many projects get! You must estimate an accurate cost for the project, calculating the cash flow of these costs (when bills have to be paid), and then balancing this against the money that's available now, as well as the income that will be earned while the project is in progress, or which will come from the sale of assets or from bank loans. It's advisable to add a contingency to these costs, as well as erring on the side of caution when calculating the income you expect to earn.

There are a number of ways of obtaining a cost estimate for your new house or renovation:

- ➢ Knowing the cost of a similar house it's possible to adjust this price, taking into account the different location, differences between the houses (including size), and the price increases which have occurred since that house was completed.
- ➢ Using the estimated square metres of your planned house it's possible to get rough square metre prices from contractors. It's important to note that the finishes you want could significantly impact this estimate.
- ➢ Approaching professional quantity surveyors, or estimators, to provide a budget estimate using information from houses you like.
- ➢ A preliminary design, or sketches, could be prepared and contractors asked to provide indicative prices for the house.

The more detailed your design and information the more accurate your price will be.

If there appears to be sufficient finances to cover the cost of the project consideration can be given to proceeding further. If the project is too expensive there may be other alternatives such as:

- ➢ Reducing the size of the project.
- ➢ Building the project in a number of phases to suit the available finance.
- ➢ Looking at ways to reduce the construction costs.
- ➢ Using cheaper materials or finishes.
- ➢ Seeking ways to obtain additional finance, such as obtaining bank loans or selling other assets.
- ➢ Considering ways of reducing everyday living expenses.
- ➢ Deferring the project until there's sufficient money available.

Estimating costs and income might go through a number of iterations, starting with very simple estimates. If these appears to validate the project a more detailed exercise can be performed. This exercise should be repeated through the life of the project, in particular when the detailed design is completed and before the contractor is appointed. It should also be redone every time there's a major change to the project, or when conditions or income change. At any stage it could be found that the house is no longer viable and ways to reduce costs or increase funds need to be found. Rather find out before you start your project that there's insufficient money, than

find out halfway through the project that you're going to run out of money. Continually checking your budget as work proceeds will enable you to take early action to reduce costs, limit cost overruns, and even when necessary find additional money.

Have you allowed for all the costs?

Frequently some costs aren't considered or are overlooked, which could result in your budget being too low. Costs for your project could include:

- ➢ Design fees for engineers and architects.
- ➢ Project management costs, if you appoint a project manager to manage the process.
- ➢ Land purchases, including duties and taxes.
- ➢ Property rates and taxes. (Including taxes during construction.)
- ➢ Costs to maintain the property before construction begins, including, security, utility bills and keeping the property tidy.
- ➢ Construction costs.
- ➢ Protecting existing structures and facilities which could be damaged by the construction work.
- ➢ Modifications to areas of an existing house which are impacted by the construction work. Often existing floor and wall finishes have to be changed in the existing building to match those that are installed in the new areas.
- ➢ Upgrading existing buildings which are being added to or changed. This could include requirements to improve the plumbing pipes and electrical wiring and distribution boards to bring them up to code and standard, or to allow capacity for the additional expansion. It may also include installing additional structural supports and beams to the existing structure.
- ➢ Demolition of existing structures and site clearing.
- ➢ Clearing existing trees and other vegetation where necessary.
- ➢ Levelling the site where required.
- ➢ Constructing ground retaining walls where required.
- ➢ Specialist foundations if required.
- ➢ Additional insurances.
- ➢ When you have to move out of the house while the construction is in progress, then the cost of temporary accommodation during

construction.

- ➢ Interest on finance loans.
- ➢ Security during construction.
- ➢ Fencing during construction.
- ➢ Permanent fences, walls and gates on the property boundary.
- ➢ Temporary construction sheds and toilets.
- ➢ The provision of water and electricity for the construction works.
- ➢ The provision of water, sewer, gas, telephone and electrical connections to the new house. These include connection fees and deposits for the utility provider, or the local council. The deposit could be equivalent to one or two months usage. Although this deposit is refundable it's an immediate expense that must be allowed.
- ➢ The cost of permits, plan approvals and building approvals by the local authorities, and when the property is within an estate then the body overseeing the running of the estate.
- ➢ The cost of arranging road closures if required for cranes or other equipment. These could include for traffic control and signage as well as fees to the authorities.
- ➢ Providing access to elevated work areas, which could be scaffolding or access equipment. Often the time required for maintaining access is underestimated and costs quickly blowout when it's required for a couple more months.
- ➢ Testing expenses.
- ➢ Hire charges for specialist equipment, such as large cranes.
- ➢ Removing rubbish, including general construction waste such as packaging, breakages and offcuts, disposing of excess soil, rock and unsuitable ground as well as getting rid of rubble from demolitions.
- ➢ Employing a clerk of works if you require one to oversee the quality of construction.
- ➢ Land survey, boundary demarcation and setting out the structures.
- ➢ When required, undertaking soil and geological investigations.
- ➢ Dealing with hazardous materials, or ground water, which may be encountered on the project site.

- ➢ The costs of finishes such as tiles, carpets, bathroom fixtures and tapware, and lights.
- ➢ Fitting out of built in cupboards (wardrobes or closets).
- ➢ Furniture, carpets and window dressings such as curtains, blinds or shutters.
- ➢ Security installations.
- ➢ Inspections, testing and approvals.
- ➢ Legal costs.
- ➢ Contingencies.
- ➢ Costs of moving into the new house
- ➢ Constructing driveways.
- ➢ Making good damage to the surrounding roads, pavements and buildings. Often a deposit has to be lodged with the local council which is refundable after the work is complete and the local authorities have checked that the roads, kerbs and sidewalk are in the state they were before construction work started.
- ➢ Landscaping, including installing irrigation sprinklers if required. This could include importing suitable topsoil.
- ➢ Taxes, which include GST and import duties.
- ➢ Fees for specialists, including town planners and quantity surveyors.
- ➢ Other costs, which could include mailboxes, street numbers, TV antennae and dishes, telephone and data connections, and new appliances.

Some of these costs could be included in the prices received from your contractors, while others may be excluded. Always understand what your contractor has priced and allow for extras that you or others must provide. Then always allow a contingency, because there will almost always be changes and unexpected surprises.

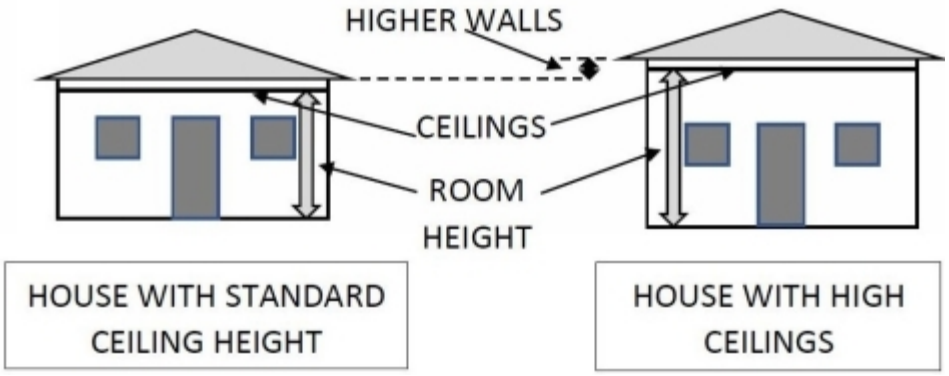
What influences construction costs?

Construction costs can vary hugely between houses, neighbourhoods and cities. The major cost drivers include:

- ➢ The size of the house. Bigger houses are more expensive to build.
- ➢ If the house is single storey or multilevel. Usually building upwards costs more money since foundations must be stronger and there’s an upper floor support structure to be completed. Of course single

storey houses require a larger property which costs more. On sloping properties a single storey house may require more extensive site levelling which adds to the costs. So, a single storey house isn't cheaper in all cases.

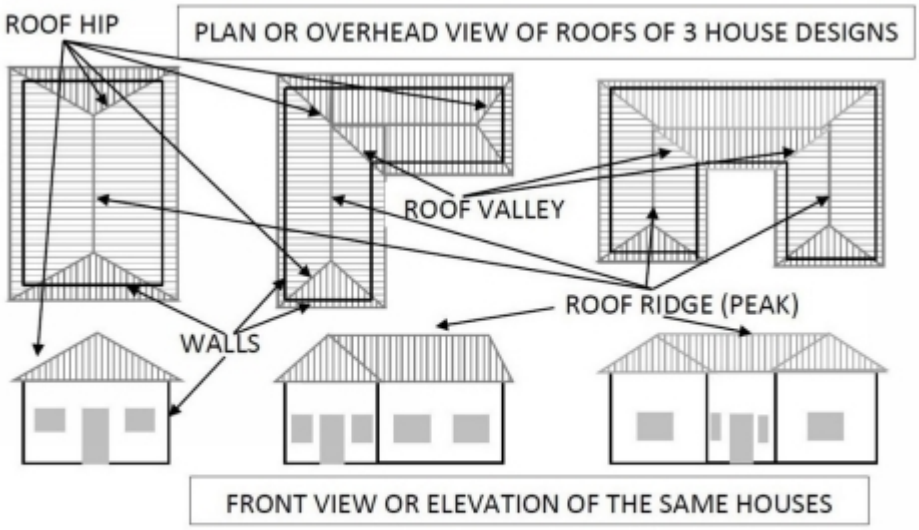
- The type of materials in the structure and the construction methods. This varies from place to place and will depend on what's available, the methods that the local builders use and the availability of skills to execute the work. So, in one area conventional clay brick construction may be the way to go, while elsewhere clay bricks may not be available, or maybe bricklayers are in demand so the cost of using bricks is expensive. Before deciding on materials and construction methods it's best to understand what methods are currently used in your neighbourhood, talk to contractors and others in the industry. Materials must also be suitable for the climate. Of course, it's not to say that another option won't be cheaper than what's currently being used by most of the contractors. It's important to understand that a material and a particular method of construction which experts tell you will be the cheapest, may not necessarily be the cheapest in your location.
- The height of your ceilings. High ceilings are great, giving the house a feeling of space and luxury. But having higher ceilings means you require higher walls, which adds to construction costs.



- The timing of construction. If there's lots of construction happening in your city then you may find that material prices, wages and subcontractor's costs have increased, and that the contractors are adding more profit to their prices. In addition, if resources are in demand then construction times increase, so your home could take

longer to build. But, when contractors, suppliers and workers are desperate for work prices fall. This could mean a difference of 10% or more to your construction costs. Even starting construction of your house in the middle of the rainy season, or in the depths of winter could result in the contractor charging more since their work could be interrupted or damaged by the weather.

➢ The layout and shape of your house. A simple square box house is usually the cheapest structure. Then, who wants to live in a box? It creates architectural interest to have a varied outline of the house, but remember that the more complex the shape of the outside walls of the house, the costlier the house will be.



THESE EXAMPLES SHOW DIFFERENT HOUSE LAYOUTS WITH THE SAME INTERNAL AREA BUT WHICH REQUIRE MORE WALLS AND LARGER MORE COMPLEX ROOFS (WHICH OBVIOUSLY COSTS MORE) COMPARED TO THE FIRST HOUSE

➢ The fittings and fixtures. The cost of washbasins, sinks, bathtubs, taps, toilets, balustrades and lights vary hugely, and there could be a difference of at least 10% to the overall cost of your house depending on your choices. Certainly, you probably don’t want the cheapest fixtures, that look cheap and are probably not as reliable as better items, but do you really need the latest imported fitting that costs five times the price of another item?

➢ Topography of your property. Steep properties require more site works to level the area for the building. Steep sites may also make it more difficult for the contractor to access all work areas.

- ➢ Access to your property. If the local roads, or your driveway restrict the size of trucks and cranes that can reach your house it could mean that deliveries have to be made using smaller vehicles, which is usually more expensive. Offloading and lifting items by hand is often more expensive than using a crane or other mechanical means.
- ➢ Distance to the connection points for your utilities and sewer lines. The longer the length of cables and pipes, obviously the more they'll cost.
- ➢ The ground conditions on your property. Digging in rock is expensive, while building on clay or other unsuitable ground may require special foundations.
- ➢ Basements add time to construction. Depending on the ground conditions and the foundations of the neighbouring structures there could be additional complexities of excavating in rock, or retaining the sides of excavations in sand to prevent them collapsing.
- ➢ The size of windows. Large windows are wonderful since they let in natural light and provide views of the garden or of ocean or mountain vistas. But large windows can be expensive, possibly even requiring costly structural beams to span over the top of them. In addition large panes of glass cost more than smaller areas of glass.
- ➢ Floor finishes vary hugely from vinyl, carpets, tiles, timber veneers and solid timber. Even the price of tiles and carpets can vary by 300% depending on the type. Furthermore, if you want to go with granite or marble tiles then you're normally talking big money!
- ➢ Standard or nonstandard? Custom homes usually cost more than a standard home plan that the contractor routinely builds. The standard plans have been simplified to reduce the materials and labour required to build the house. Even just using standard window and doors can be much cheaper than if they're individually measured and made to fit your design.
- ➢ The number of bathrooms and the size of your kitchen. Bathrooms and the kitchen are the most expensive rooms in the house. Adding a bathroom, or increasing the size of a bathroom or the kitchen

will add to the overall cost of the house, even if you aren't increasing the overall size of the house.

- ➢ Floor tile layouts. Larger tiles are often easier to lay on flat areas. Laying floor tiles in a diagonal pattern relative to the walls requires more cutting than for tiles laid in a square pattern and it takes more time and usually generates more wasted tiles. Laying tiles of the same colour is obviously easier than creating a pattern using different colours and types of tiles. Laying small mosaic tiles is labour intensive.
- ➢ Roof designs and coverings. The price of roof covering materials will depend on the size and shape of your roof, as well as the available products and skills in the area. The more complex the roof, one with varying heights and with a number of hips and valleys, the costlier the roof will be. Simple A-frame roofs without hips and valleys are the cheapest.
- ➢ Curves cost money. Whether it's arches over windows and doors, or walls that are curved, they will be costlier to construct.
- ➢ The time to construct sometimes impacts the cost. If you want your home built more quickly than the contractor would normally take then you'll probably have to pay extra. Conversely homes that are complex, or that require additional tasks, take longer to build, which adds to the overall cost.
- ➢ Instant garden or not. If you want a perfect lawn and large trees and shrubs in your new garden when you move in then you'll pay a premium. If you are content to watch your garden grow, maybe seeding the lawn or planting runners, and planting small trees and shrubs, then the cost of your garden will be much less. The size of the garden also impacts costs.
- ➢ The type of material used on kitchen counter tops and vanities varies from chipboard covered with a veneer (often melamine) to solid timber, reconstituted stone, granite and marble. The cost will depend on the size of the counters and vanities, the number of cut-outs through them for cook tops, sinks and taps, and of course the material. Even the price of granite can vary by 400% depending on the colour you pick.
- ➢ Fitted cupboards, including kitchen cabinets. These can be constructed of solid wood, or in most cases from chipboard with a

veneer. But even the type of wardrobes in bedrooms can vary hugely in price depending on their layout, number of shelves, drawers and hanging rails.

- ➢ The internal layout. The more walls the higher the cost. But, spanning a big open room without supports could add to the cost of upper floors and roofs.
- ➢ The type and sophistication of security measures required in your house.
- ➢ Positioning of bathrooms. Keeping bathrooms together, or above one another can reduce the cost of the plumbing.
- ➢ The type and size of heating and cooling systems. Houses in cold regions or areas that face extreme heat will require larger and more efficient heating and cooling systems, which adds to the price of your house.
- ➢ The type and make of appliances. The price of kitchen appliances, such as cook tops and ovens can vary by 400%.
- ➢ If windows are double glazed, or even triple glazed. The additional cost will also depend on the size of the window and frame material.
- ➢ Additional features. This could include swimming pools, solar electrical panels, garden walls and gates.

You should take into consideration some of the above when formulating your construction budgets and when designing your house. I'm not suggesting that your house should be a box with the cheapest fixtures and fittings, but it's important to understand that house prices can vary hugely from one area to another, and from one plan to another. When receiving quotations it's vital to understand what you'll be getting for your money. Contractors should also familiarise themselves with the construction conditions on your property.

What will it cost when you're living in the house?

It's important to consider the ongoing costs of the house after the construction work is complete. The running or ongoing costs could include:

- ➢ Loan repayments for money borrowed to fund the project.
- ➢ Utility payments for electricity, gas and water. Larger houses inevitably use more power, gas and water. However, with better design it's also possible to substantially reduce water, gas and electricity consumption. Incorporating solar or wind power

generation may even mean that excess electricity can be sold back to the utility provider.

- Insurance, which usually depends on the value of the house – the more expensive the house the higher the premiums. Insurance premiums also depend on the location, with premiums being higher where risks are perceived to be higher, such as houses located in areas prone to flooding or in areas where crime levels are high. However, incorporating security measures into your new home such as alarms, window locks and security screens, help reduce insurance premiums. Lock up garages will reduce insurance premiums for vehicles.
- Rates and taxes are often calculated according to the value of the new house, and they're dependent on the size and the location of the property.
- Maintenance and repairs. All buildings require some maintenance. Houses that require regular painting can be a nuisance as well as costly. Areas close to the coast require more maintenance. Selecting higher grade products, materials and equipment can lessen the amount of maintenance and increase the life of items. It's important to select equipment that can easily be serviced, that has good warranties and which has parts readily available.
- Upkeep of gardens. Many enjoy looking after their gardens. But for some this is a chore, or they don't have time. Garden services are often expensive. However, gardens can be planned to limit the amount of maintenance, and even the amount of water required.
- Security costs, which could include alarm monitoring, or more, depending on the perceived security risks.
- Estate management fees. Some residential estates have management fees to pay for the estate security and for insuring and maintaining the common assets such as fences, roads, sidewalks and pools.
- Pool running costs, which includes power to operate the filtration system, water to top the pool up because of evaporation or excessive splashing, chemicals and pool cleaning and maintenance.
- Other costs which are related to the location, which could include travel costs to work (properties located closer to places of work

have lower travel costs) and the costs to get children to school. Travel costs could include toll fees, fuel, bus fares, etc.

When do you want to move in?

How soon do you want it to happen and how long will the project take? Before work can start there're usually a number of steps to go through, which includes finding the contractor, planning and designing the house, arranging finance, obtaining all permits and permissions including plan approvals, finally construction, connections of all the utilities, and then final occupation permits. Some of these processes can be lengthy and depend on the design, construction methods, size and complexity of the house, the contractor, and the site layout and conditions.

If time limits are short then it pays to keep the house as simple as possible, using standard house plans and employing a reputable builder.

Of course, it's usually not wise to be starting the construction at the start of the rainy season or in the middle of winter in regions that experience severe rains or extreme cold. You also probably don't want to start renovating your house just before Christmas, or when you're expecting visitors, nor do you want holes in the roof or walls when it's likely to be cold or rainy.

If you're going to be doing most of the work yourself you'll want to plan the construction around when you can get time off work. It will also help if most of the work can be done in summer when the days are longer.

Always have a realistic expectation of how long the project will take to complete. Then add some. It often takes longer than expected. Just getting through all the red tape to get permits and permissions can take weeks. Then during the design phase invariably you'll be the problem, making changes and sending drawings back. Then construction is in your hands, the weather gods and the contractor. The more changes you make (or your partner makes) during construction the longer it's going to take. Using non-standard items will extend the timeline even further.

Never try and squeeze your construction time into meeting a specific time – like it must be completed by Christmas. Rather, establish a realistic time frame which won't jeopardise safety, quality or your budget. In fact, having a flexible start and duration may even allow you to get a better construction price from your contractor.

If your circumstances are going to change in a couple of years, maybe children are going to leave home, then it might be wise to delay the project

until then.

Will others buy your unique design?

Property owners and investors should also be asking themselves, “what will others pay”, and “what can the market afford” since these are equally pertinent questions.

For example: If you are an investor it’s pointless purchasing a house for $500,000 if you plan to spend $200,000 on renovating and improving it and the average house price for the area is $650,000. With the purchase price, plus the costs of the improvements and the other costs, you’ll need to sell the house for at least $800,000 to make a profit. Selling a house for $800,000 is going to be difficult if the average house price for the neighbourhood is much less than this.

Now I know you may only be considering building or renovating a house for you and the family, but it’s pertinent to consider the future as well. The majority of people don’t live in their houses for ever (or until they die) but they inevitably eventually sell the house and move on. Unfortunately, some design their house solely for their tastes and enjoyment and then they find they cannot find a buyer – or certainly a buyer who is prepared to pay what it cost to build the house. So carefully consider whether the indoor pond you want is going to be something that you’ll still enjoy in five years’ time, or if it will be appreciated by future prospective buyers. Paint colours can be easily changed, but floor and wall tiles are more expensive and difficult to change, and altering the house structurally will be costly and hard for future buyers.

Case study: There’s a newish house down the road from us that’s designed as an Italian villa. The exterior is pink (a textured coloured render which is expensive) and the interior is ornate with stained glass windows, and fancy light fixtures which are very decorative. However, everything is a little over the top. Now for a few, the house will be absolutely fabulous, but for most people it’s nice, but not really a house they want to live in, especially as you should have furniture that fits the style of the house. The originally builder has gone to great trouble and expense to style the house in this way, but a large portion of prospective buyers don’t appreciate these costs, and in fact many of them will factor in additional costs to repaint the house and redo the interior to suite their tastes. Consequently the house takes several years to sell and never realises the original construction costs.

Always make realistic decisions, considering the alternatives as well as the consequences. Fashions change, what we like changes, what others like changes with time. Will we like our house in 5 or 10 years' time? Can we easily change and adapt our house?

Constructing a house for investment purposes

You may decide to renovate, or build, a new house as an investment with no intention of living in it. The house is either sold at a profit (hopefully if all goes according to plan) or it's rented to earn a monthly income. In either case it's important to consider what others want and not be overly constrained by your own needs and tastes. So you may for instance like green, or like walls that are painted bright colours, but unfortunately these aren't always what other people like – rather play it safe and stick to a neutral palette of colours.

It's vital to understand what prospective customers are looking for. How many bedrooms, bathrooms and garages? Are they looking at particular areas or lifestyle choices? Of course, understand what's available, because it's pointless competing in an already oversupplied market.

The choice of house also depends on the market you're aiming for. You should be careful not to cut costs and go for finishes which aren't upmarket when in fact the house is aimed at more affluent people. Or, go the other way and incur large costs on expensive finishes when prospective buyers are only looking for a more cheaply priced house that has the basic essentials.

However, it's important not to sacrifice building quality. Buyers always expect quality.

For rental properties you should consider using products and materials which are easy to clean and maintain and which are hardwearing. Fragile items, or appliances which are difficult to use won't be suitable.

What defines a project's success?

What defines a project's success? This might seem a simple question with a simple answer, which is that your project is within budget and you like it! But there is more. A new home build or renovation is successful when:

- ➢ It's finished within budget.
- ➢ You are satisfied with the end result and it has met your expectations. It achieves what you set out to achieve.

- No person was seriously hurt during the construction. You certainly wouldn't want to be hurt constructing your house, but equally I think it would be horrible to know that a construction worker had been seriously injured on your property.
- Nobody will be injured using the house and its facilities.
- The quality of your house is good – aesthetically and structurally, and it meets all the local and national codes and specifications.
- The work provided value for money.
- There were no major disputes with contractors, neighbours or the authorities.
- Construction was finished when it was scheduled to be complete.
- You and your family are happy with the house for many years. It's functional and delivers the lifestyle you and your family desire.
- The environment wasn't damaged during construction and the house is environmentally friendly.
- The house is safe and secure for you, your family and visitors.
- Your house is easy to live in and maintain and the ongoing costs, such as utility bills, are relatively low.
- Your house will be easily sellable when the time comes to move on.
- The house can be easily adapted to suit your family's changing needs.
- It was completed with minimal fuss.
- The house is in an area that you and your family like. An area where you will be happy for many years to come.

But there are other stakeholders that we should also consider:

- I believe that it's important that contractors and suppliers don't lose money during the construction of your house. Sure, there are some who may be useless or poor businesspeople and you can't help them. But, you should never take advantage of the hard working and conscientious contractors that are working to keep their families with a roof over their heads. You should pay them what's due on time, and treat them fairly. They have workers and suppliers to pay. You shouldn't be looking to profit at somebody else's misfortune.
- You should respect your neighbours. Of course there'll be some neighbours that will whinge and whine about anything, and you

might never be able to make them happy. But, at the end of the day your new house should not reduce the value of your neighbour's property. You have to live next your neighbours for many years so it's important to try and understand their concerns and where possible take these into account, maybe making modifications to your design to reduce the impact of your new building on them.

Steps to constructing or renovating a house

The steps to a successful home build or renovation project include:

- ➢ Talk to your partner.
- ➢ Understand why you're embarking on constructing a new house or renovating your existing house. Consider alternative solutions.
- ➢ Gather ideas and establish a file, tear out magazine pictures you like, take pictures and ideas from Pinterest and Facebook, visit houses for sale, take photographs, make sketches (these could include ideas and layout of houses, kitchens and bathrooms).
- ➢ List the features you definitely want, those that are optional ('would like to have') and those which you definitely don't want.
- ➢ Consider your family's future needs.
- ➢ Work out how much you can spend.
- ➢ Decide how many bedrooms, bathrooms, living rooms and garages you would like. Think about the ideal room sizes and layout of the house.
- ➢ Start working out a budget including all the costs.
- ➢ Decide what expert help you'll need.
- ➢ If you intend to do some of the work, get training and read books relating to the trades you'll be doing.
- ➢ Visit local house construction projects. See the typical construction methods, details and materials.
- ➢ Look for a property for your house. Always consider alternative neighbourhoods. Understand any restrictions on the property.
- ➢ Review your budget, and if you can afford it purchase the property.
- ➢ Visit local builders to see what standard plans and houses they offer.
- ➢ Visit building material showrooms to gather ideas on cabinetry, kitchen layouts, windows, tiles, bricks, doors, etc. Collect catalogues and take photographs to add to your file of information.

- ➢ Visit the property. Understand what the best aspects of the property are and how they should be incorporated into the house. Look at the properties in the street. Consider the impact they may have on your house.
- ➢ Develop a style for your house.
- ➢ Review your file and take out all the photographs, catalogues and pictures that aren't relevant to your chosen style or which won't work for the property you've selected, then put them in another file for use in case you change your mind. Whittle the chosen information down into a coherent style and elements that fit together and suit your lifestyle and the property.
- ➢ With your list of wants and don't wants, and now knowing the location for your house prepare a design brief.
- ➢ Decide how you're going to design and construct the house. What will you do and what will you engage professionals to execute?
- ➢ Understand all the restrictions applying to your property.
- ➢ Select a designer who you think you can work with and that can deliver your chosen style and requirements.
- ➢ Get a survey of the property so you know where the boundaries are, what the slope of the ground is, where significant features are and the position of the road and the service connections.
- ➢ Have the designer prepare sketches.
- ➢ Make changes. Consider alternative solutions. Finalise the layout and position of the house.
- ➢ Get an estimate of the costs and check that the house is still within budget.
- ➢ Select the types of finishes, fixtures and fittings.
- ➢ Make changes to reduce costs if necessary.
- ➢ Have the designer prepare construction drawing.
- ➢ Review the design to check it meets your requirements and has stayed within the design brief.
- ➢ Get all permits and permissions to start construction.
- ➢ Find contractors and have them price the project.
- ➢ Adjudicate the prices to check which is the best value and the right contractor to work with.
- ➢ Check your budget.

- ➢ Ensure all your finances are in place, including approval of loans.
- ➢ Arrange for water and power connections for the construction work.
- ➢ Appoint the contractor.
- ➢ Check all insurances are in place.
- ➢ Receive the surety or bond from the contractor.
- ➢ Notify the neighbours of when construction will be starting and how it will impact them.
- ➢ Ensure you have everything in place ready for the contractor.
- ➢ Have a kick-off meeting with the contractor's team.
- ➢ Issue them with the latest copies of the construction drawings.
- ➢ Monitor the work. This includes; checking progress, ensuring all tests and inspections are completed, seeing the construction site is kept clean and tidy and work complies with safety regulations, making sure the work complies with the drawings and checking the quality of work.
- ➢ Continually review and update the budget ensuring that all variations and costs are captured.
- ➢ Before the project is completed make a check list of all the outstanding items and things to do before you can move in.
- ➢ When the contractor is complete, carry out an inspection and prepare a snag or punch item list of all defects which must be fixed.
- ➢ Arrange and complete all connections of the utilities.
- ➢ Arrange insurance for the completed house.
- ➢ Check that all security installations are operating.
- ➢ When the contractor has fixed the snag list items reinspect the work, checking that the items have been rectified and that no damages have occurred in the rectification process.
- ➢ Get all warranties and operating manuals from the contractor.
- ➢ Check that the contractor has completed all work and cleaned the site.
- ➢ Settle the final account with the contractor.
- ➢ Arrange for all work in your scope to be completed, such as fitting curtains, installing television cables, completing data and telephone connections.
- ➢ Get the occupation permit.

- ➢ Inform the bank of the final costs.
- ➢ Return the builder's surety to the contractor.
- ➢ Return any equipment you hired.
- ➢ Store 'attic stock' (spare stock) where it's safe and can be found if required.
- ➢ Pay all the outstanding accounts and fees.
- ➢ Get deposits back that were paid to the authorities.
- ➢ File all project paperwork in a safe place where it can be readily found.
- ➢ Arrange for your furniture to be moved into your new home.
- ➢ Explain to the rest of the family how everything operates in the house.
- ➢ Finally at last – it's time to sit back on your patio and enjoy the fruits of your hard work.
- ➢ At the end of the defects liability period inspect the house for additional defects. List these and get the contractor to attend to them.
- ➢ When the defects are completed reinspect the work and sign them off.
- ➢ Carry out regular maintenance as required.

Many of these steps are discussed in more detail in my book 'An Introduction to Building and Renovating Houses – Hiring Contractors, Managing Them and Finishing Your Home'

Summary

Your early decisions can live through the life of the project and come back to haunt you if they're bad decisions. It's important not to be impulsive, but rather to carefully consider what you and your family require, what you like, what you don't like, what you can afford and what your abilities are. You should be clear as to why you want to build a new house, or why you're going to renovate. You must include all of the costs in your calculations, because frequently some are overlooked which cause financial stress and could even jeopardise the project.

Although it's important that the house delivers what you and your family needs it's pertinent to also consider what buyers in the future may want so that if you decide to sell your house at some time, which most people do, you'll readily find a buyer who will reward you for your work

and costs. If the house is an investment property then you definitely need to understand what buyers and tenants want and what other houses are available.

In formulating what you like and need it’s necessary that you undertake research, looking at magazine, visiting houses for sale, getting ideas from your current home and previous houses you’ve lived in. Take photographs of things you like in a house. Look on websites for ideas and styles that appeal to you. Put together a file of ideas. Make a list of what you need, what you like and what you don’t want. Start to get a feel for the style that best suits your lifestyle. Of course, discuss ideas with your partner and try and build on things that you both like.

Understand the steps in the process of constructing your house and know where you’ll need help. Start working on a budget and calculating costs for the project.

Right, so you’re now ready to make some important decisions. Of course, that decision could also be to do nothing, maybe even do some minor modifications with your current home, or put your home building project on hold until a more suitable time.

Chapter 2 – Choosing Your Property – Where to Build?

If you're going to build a new house it's important to select the best property. Often people buy a property for their dream house only to find that they haven't done their research properly and there are unforeseen costs, or the property isn't suitable for their needs, or the area's character is changing, or isn't as expected and it isn't such a desirable place to live. Buying property is a major investment. There are often transactional costs and fees to pay, so it isn't as simple as making the wrong purchase from the shops and being able to take it back for a refund. In this case, selling a property that's unsuitable will almost certainly lead to large additional wasted costs.

It's essential not to purchase on impulse, but rather to do your homework and get answers to many of the items listed below before purchasing the property.

A neighbourhood could be quiet with little traffic on the weekend when you visit, but during the week it could be completely different, with no parking available in the street, busy roads, traffic congestion and noise. In fact, even during the course of a weekday the streets can change, being quiet in the middle of the day and then busy at peak hours.

But properties can even change with the seasons. That brilliant view could be blocked out when the trees are covered in leaves in summer, or your nice sunny piece of ground could be in the shadow of the neighbouring buildings in winter when the sun is lower on the horizon.

Location – the right location for you

The common saying 'location, location, location' means that selecting the right location is the most important part of buying a property. Obviously in small towns this isn't as important as in a big city. Having said this though, do you want to purchase a property in a small town where reselling or renting the property may be difficult?

So properties located on busy streets, or next to industrial areas, perhaps neighbouring shops and restaurants, maybe overlooked by apartment buildings, those that are in undesirable neighbourhoods, or those that have unpleasant noisy neighbours aren't going to be desirable

locations. If a property appears to be a bargain, understand why it's a bargain, what does the seller and others know that's not immediately apparent to you.

Obviously properties that are in leafy, friendly neighbourhoods, with quiet streets, near parks, with easy access to schools, shops, transport networks, recreational facilities and work opportunities are usually desirable locations. These ideal locations are often in short supply, meaning that they're more expensive. The thing is that in the future they'll be even harder to find, which will ultimately increase their value.

But, it's important to understand that a good location shouldn't be impacted by 'snob value'. Far too often we allow ourselves to be influenced by what others in our family and community think. Do your own research. Be prepared to look beyond the areas you're familiar with. Take time to visit different suburbs and towns, get an understanding of what's available and what the costs are. A location that isn't seen as the best location right now, because it's older, or less 'upmarket', may be about to change. Often older areas go through a period of regeneration and suddenly property values increase when it's perceived to be the new desirable location. However, older areas could also go the other way, where they become rundown, dilapidated and even overtaken by crime.

New transport networks, schools and other facilities can quickly turn an area into a desirable location. Buying into these areas before the rush can mean you're purchasing property that will rapidly increase in value. It's important to understand what's happening in areas and what the plans are.

Understand what your priorities are, and those of your family. What lifestyle are you looking for? That desired location that many hanker after might not actually be the right location for you. We are all different, with differing needs and desires. Read on to understand which of the following points are important for you and your family when choosing your property.

Start with the right location, suburbs and neighbourhoods and work from there. Always be open to other possibilities and areas you aren't familiar with.

Schools – how they influence location

In many cities the public schools that children can attend depends on where they live. Some schools are more desirable than others, and often parents will go out of their way to ensure the property they purchase is in that school's zone or catchment area. In fact, preferred school zones can

have property prices up to 10% higher than other zones. In some cases this price difference can be seen on the same street – with properties on one side of the street falling into a desired school zone being more expensive than those on the opposite side which fall into another zone.

It's worth taking note of school zones as these often don't follow the suburb or city boundaries. School zones can change with time, particularly when suburbs have a growing or declining number of school-age children. It's also pertinent to bear in mind that the quality of a school can change with time and it's dependent on a number of factors. However, if you want your children to attend a particular school then it's important to understand the zoning of that school and ensure that you get a property that falls well within its catchment. If you're building a rental property that will appeal to families, then it will have added demand, with a higher rental value, if it's in the right school zone. In some cases it may be worth paying an additional premium just to ensure your property is in the best school zone.

In many cases it may also be worth owning a property that's near a transport route, such as a school bus route, which connects to the desired school. Or, even within walking or cycling distance of your selected school.

Being too close to a school can also have drawbacks, such as increased traffic on schooldays, a shortage of street parking, even parents parking on your sidewalk. Schools can also be noisy, particular junior schools. There's also always the risk of vandalism and litter caused by unruly children walking past your property.

Transport – asset or liability

The availability of public transport can often be an advantage. However, being too close to highways can mean the location is noisy, it could even mean surrounding roads are congested in peak times with traffic accessing the highway, there are often added risks from vehicle pollution, and at night the car and streetlights could be a nuisance. Areas close to railways also have the noise of passing trains and areas close to level crossings may have noisy warning bells when trains approach. Being on bus routes can be convenient, but it often brings additional noise and pollution.

Shops – convenience or nuisance?

Being near shops can have advantages. New outlying suburbs might be far from established shops. However, one should be mindful of the disadvantages of being too close to shopping malls. There could be increased traffic, pressure on street parking and trucks may make early

morning deliveries. If there're liquor stores, pubs or clubs there could be noise late at night, unruly and noisy traffic past your property and added litter on the roads and sidewalks.

Existing infrastructure – roads, water, power, internet & sewer

Is the property served by reasonable and reliable infrastructure?

- ➢ Are there decent transport networks and are these reliable and maintained? Sometimes properties appear accessible, but when it rains or snows the roads could be cut-off for days at a time. Occasionally authorities don't have funds to maintain rural dirt roads which can rapidly become potholed and deteriorate.
- ➢ Not only do you need sufficient water and power for your house, but it should be reliable with limited interruptions. The alternatives may be to have water storage tanks and back-up power sources, or be self-sufficient with solar or wind power generators and rainwater collection tanks or a bore. It's important to ascertain what's available and that it's sufficient for your planned requirements. Sometimes there are limited quantities, or water pressures are too low. This could restrict what can be done on the property, especially if you're planning to build multiple units.
- ➢ Are there reliable and sufficient internet connections? Some areas have very slow and interrupted service. In fact, there might not even be mobile telephone access.
- ➢ Is there a town sewer to connect to, or do you need to build a septic tank?

See later.

Future new infrastructure – how it could impact you

New roads and railways are always being constructed and old ones are being upgraded with increased capacity. Often improved transport networks improve accessibility to an area, making it a more desirable suburb to live. This increases property values.

However, sometimes these roads and railways are constructed near your property, even turning the quiet suburban laneway in front of the property into a busy highway. This brings additional noise and pollution and can devalue your property in an instant. Worse still, maybe the property is in the path of a proposed highway and your dream home may one day be

flattened to make way for the road. Even if the new highway is some distance away, some existing roads could become feeder routes to these highways with additional traffic.

Other infrastructure, like new power lines and electrical substations are unsightly and can also impact the amenity of the area.

That nice greenbelt near the property may be green with no houses because it's been reserved for a future highway or railway, or place for a new powerline. If there're green spaces then understand if these are designated parks, or if they could in the future be turned to other uses.

Much of this planning is often done years in advance. Plans can even be well advanced, then become shelved due to a lack of funding or slower growth. Ten or twenty years later the plans are dusted off and suddenly the project gets the go-ahead.

It's therefore essential to understand the planned future infrastructure for the area. This could involve visiting the local authorities who usually have a master plan for the area, as well as talking to the various transport authorities.

Future growth of the area

Properties can increase in value if they're situated in growth areas. Where new infrastructure is being constructed, where new job opportunities are being created, and in areas that'll become popular in the future.

However, if you're looking for the quiet life you might not want to live in or near a growth area. Your quiet village atmosphere could quickly disappear. It's therefore important to understand the local trends, and what local governments, developers and companies are planning for the area.

Sporting amenities – nice to have or nuisance

Nearby sporting amenities can add value to a property. They provide green spaces, areas for children to play and place to walk your dogs. However, they often result in traffic and parking problems when events are on, and there could be noise and an increase in hooliganism and vandalism in the area after sports events.

How much land do you want?

The size of your property could be influenced by:

- What's available.
- What you can afford.
- How much garden or outdoor area you require.

- ➢ If you require space for a swimming pool.
- ➢ The amount of parking required on the property. If you have boats, caravans and kids with cars you'll be looking for more space for vehicles.
- ➢ Sports and hobbies you plan to carry out on the property. Some require large sheds, even tennis courts. Some hobbies are noisy and it may be better if neighbours are more distant.
- ➢ If you have large dogs and require more outdoor area for them.
- ➢ The amount of privacy you're seeking.
- ➢ The size of house you're planning to build, and if this will consist of one level of two or more floors.
- ➢ Possible future extensions, which could include adding additional bedrooms, or even a flatlet.

Small properties will restrict how you orientate the house and where you position it on the property because the house will fill most of the property and it will have to follow the orientation of the property.

The size of neighbouring properties

Some might ask why should we worry about your neighbour's property. Well, you may have a large property, but if your neighbour's property is small, causing their house to fill their property, then it'll be built right close to your property's boundary which could result in them overlooking you and impacting your privacy. In addition, the buildings on their property may cast a shadow across your property and rob you of sunlight. The closer your neighbour is, the more likely you could be impacted by noise emanating from them. But, there's also the advantage of smaller properties where neighbours can look-out for your property, and often it's a deterrent to criminals.

Very large properties may later become subdivided into smaller properties and the privacy you thought you had could suddenly disappear.

Zoning – what it all means

Most towns and councils have zoning laws which dictate the minimum size of the property and what the land can be used for. For example, the property could be zoned for residential use only, or for offices, for commercial use, for warehousing and factories, or even a mix of these. In addition the residential may be zoned for single houses or multi-dwellings or apartments.

Usually town councils have zoning maps which can be viewed on their websites or at their offices. Unfortunately zoning does change, so it's important to ensure that you view the latest zoning maps and enquire if there're any proposed changes being considered to the town or city planning scheme.

Areas along transport routes often have their zonings changed to allow increased densities, or changes to commercial. Sometimes these changes can benefit property owners when their property values suddenly increase because these properties are sought after by developers who want to take advantage of changes to zoning and the increased densities.

Unfortunately though, you may suddenly find your quiet neighbourhood altered and disrupted when zoning changes and the builders move in. Your neighbour's single storey house could be demolished and replaced with a multistorey apartment block which robs you of privacy and sun. Your property value plummets because no-one wants to buy a house overshadowed by an apartment block or office building.

New businesses in the area may increase noise and traffic, and in certain cases bring crime into the area.

Of course, while the new buildings are going-up the construction causes noise, dust and disruption to traffic, sometimes interrupting utility services and resulting in parking shortages.

Therefore, before buying a new property, or even spending a large amount of money on your current property, make sure that you understand the possible changes to zoning laws. Even look a little wider than the surrounding properties, because even the zoning in a neighbouring area could have a profound effect on your amenity and community.

But, sometimes it's possible to apply for changes to zoning for your property, or even a relaxation in the laws applicable to your property, which might allow you to do things on your property that you hadn't considered. With clever thinking and help from your local council it may be possible to add value to your property, by for instance subdividing it and selling part of the property. So if you like the area where you live and have a large property you may be able to sell part of the property to pay for your renovations. A smaller property is easier to manage. Alternatively, maybe you could build another house on the property for your children or elderly parents, or even to rent for extra income. Or, build a cottage for you, with

your children taking over your existing home. So changing zoning could help you or shatter your dreams.

The value of the surrounding properties

If you're considering the resale value of your property then it's important to consider the average house price for the area. You might be planning to build a luxurious mansion when most of the surrounding properties are modest average size homes. Not only could your new home look out of place with the neighbours when it's completed, but you may find that the surrounding houses impact the value of your new home, pulling it down. You don't want to have a house that's cost way more than the average price for the area. Rather, your completed house should preferably cost (including the value of the land) around the average property price for the neighbourhood (or within 25% of the average).

Changing neighbourhoods – going up or coming down?

Over time neighbourhoods, suburbs and districts change. What may now be a leafy family neighbourhood could in a few years change. It could be rezoned and apartment buildings start springing up, or the families might move out and be replaced by less pleasant neighbours. But, often the reverse happens and suburbs that were old and run-down are revitalised and become sought after. Understanding some of the drivers of this change, as well as knowing where in the cycle your chosen neighbourhood is will be useful.

The following can change your neighbourhood:

- Local industries sometimes have a dramatic impact on neighbourhoods. This could be because a large portion of the residents are employed by one industry and if it suddenly reduces their employees, or even closes, then many residents become unemployed, meaning they have less money to spend on maintaining their property, rents fall and people move from the area. Alternatively if the industry grows there'll be an increase in the number of people wanting to move into the neighbourhood. Of course, some industries detract from neighbourhoods if they belch out noxious fumes or smoke, or if they are particularly noisy.
- New roads or rail networks can change the neighbourhood. Sometimes these cut through the area, they could be noisy and create more traffic on local roads, but they could make the

neighbourhood more attractive if people want to live close to convenient transport links.

- ➢ Changing economic conditions can force change.
- ➢ Land is rezoned, which could mean that the leafy housing estate is cut up and redeveloped into apartment buildings, or even commercial properties.
- ➢ With time the demographics of an area change. Families with young children see their children grow up and move out the area. Suddenly they want to downsize or move away. Old family homes can be snapped up by developers.
- ➢ Developing infrastructure can change neighbourhoods. New schools could attract families with children, café strips could attract a younger trendier crowd who want smaller properties.

Will you be safe?

Security is a major concern to many. Unfortunately neighbourhoods do change and what's considered a safe neighbourhood today might not be safe in a few years' time. Look out for:

- ➢ Properties near pubs, nightclubs, liquor stores and sporting events which might be more crime prone.
- ➢ Inner city areas which often have more crime.
- ➢ Large properties with distant neighbours could be more of a crime target than areas where neighbours have a good view of the property.
- ➢ Signs of vandalism and properties with lots of security fencing and window bars which is an indication of high crime.
- ➢ Families happily walking the streets and cars parked on the street may indicate that the area is relatively safe.

Nobody wants to live in areas where there's crime, or expose their families to additional risks. There are also additional costs of living in these areas which could include increased insurance premiums for cars, personal affects and property, as well as the extra costs of security features, such as alarms, cameras, fences, gates, window screens and security monitoring.

Always do research, which could include reading the local newspaper and talking to neighbours, shop owners and people in the street.

The impact of neighbouring properties

Neighbours can be a nuisance, so consider your current and future neighbours when purchasing your property.

Most people prefer some privacy and don't want their neighbours looking into their house, or overlooking their entertainment or pool area.

Some neighbours may be a security threat and could encourage home invasions, burglaries or malicious damage to property. You won't want to live next door to a derelict property which is waiting for redevelopment and is currently inhabited by vagrants. Many people don't want to live next door to council or government housing. Some neighbours could have noisy hobbies, like rebuilding and repairing motor cars.

Consider your neighbour's property. Is it run down, does it have a large out-door entertainment area close to your property, maybe it has a large shed or barn that's ideal for a noisy hobby?

The vegetation growing in neighbouring properties could impact you. Large trees might have roots which grow into your garden blocking your drainpipes, causing inconvenience and expense. A large tree growing near the boundary may shed leaves and fruit which will be messy in your garden, foul your pool and even block your drains and gutters. Large overhanging branches can be a security risk allowing people to access your property from your neighbour's. Even medium size trees growing on the boundary can eventually damage the boundary fence or wall, possibly pushing it over as they get larger. Roots could crack and damage your paving. Remember, that small tree today could quickly become the nuisance tree of tomorrow.

Even neighbour's hedges and climbers growing along the boundary have been known to cause neighbour feuds of epic proportions when one neighbour has dared to trim the other neighbour's plants.

Some neighbours don't look after their garden, rather leaving it to grow wild. This can detract from the neighbourhood and even negatively impact the value of your property. Badly overgrown property also attracts rodents and vermin which will enter your property.

Unfortunately you can't mitigate against all of these problems, nor can you predict what neighbours do in the future, however, careful choice may prevent some of the common problems occurring.

A view forever – or is it?

Often the selection of a property is influenced by the views from the property. These may be over parks, lakes, rivers, the ocean, the city or bush-land. It's important to understand if these views will be permanent. Many

people pay a premium for a property because of its views and outlook, only to be disappointed later when the view disappears. Views could be changed by:

- ➢ Trees growing bigger, in either your property or the properties between you and the view. It might be possible to remove the trees in your property, but you won't have any say about the trees in your neighbour's property. The view could even be different between winter and summer when the trees are in full leaf.
- ➢ Buildings being constructed in neighbouring properties which obstruct your view.
- ➢ The outlook being radically altered, for example the bush-land or park is cleared to make way for housing or an industrial estate. Sometimes that peaceful lake, beach-side or river-front view can be changed by the construction of new facilities, such as parking, restaurants, boat-sheds and children's playgrounds.

If you're going to pay a premium for a property with a view you should consider how permanent the view is. Take care when designing your house so as to maximise the view considering possible future developments. When designing the garden select trees that won't become so big that they obstruct your view.

Difficulties of narrow lots and odd shaped properties

In most case a property that's square, or that's somewhere between square and twice as long as the width, is better than long narrow properties. Although, obviously for very large properties this shouldn't be an issue.

Very narrow properties can mean that:

- ➢ Your house will be close to the neighbours on each side, which impacts your privacy. It could mean additional noise and it could limit the sunlight entering your house.
- ➢ You might not have space to get around the sides of the house.
- ➢ Your house will be long and narrow.
- ➢ You may not have space to fit a double garage across the width, or the garage could fill most of that side of the house and spoil the street appeal and restrict the sunlight reaching that portion of the house.
- ➢ Noise from your house, from your children, music, entertaining, or a hobby could disturb the neighbours.

- ➢ It restricts the orientation of the house which must now follow the direction of the property.

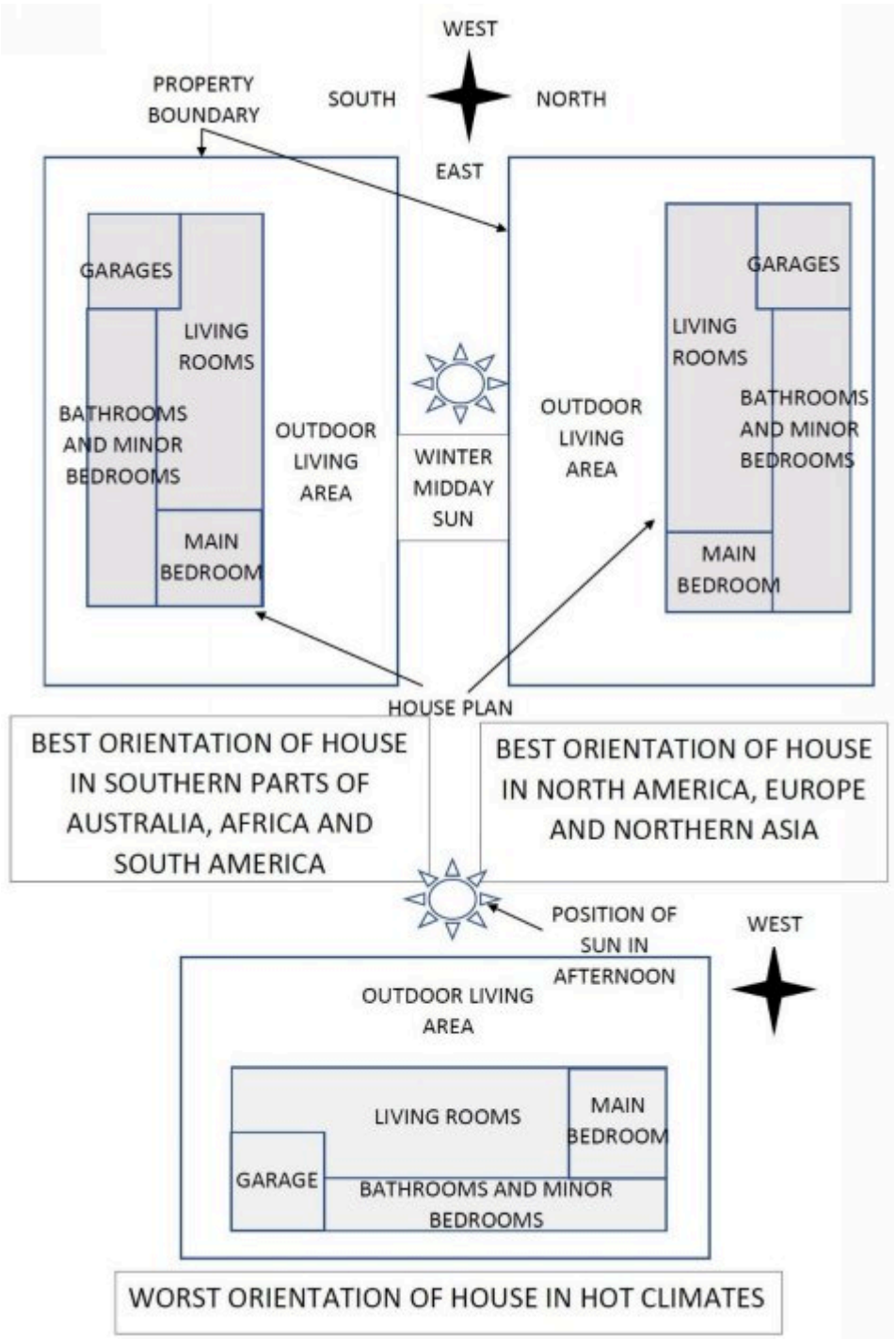
Irregularly shaped blocks might mean that some parts of the property are difficult to build on and there could be awkward unused triangular bits of garden.

The orientation of the house – why it's important

The orientation of your house is important because:

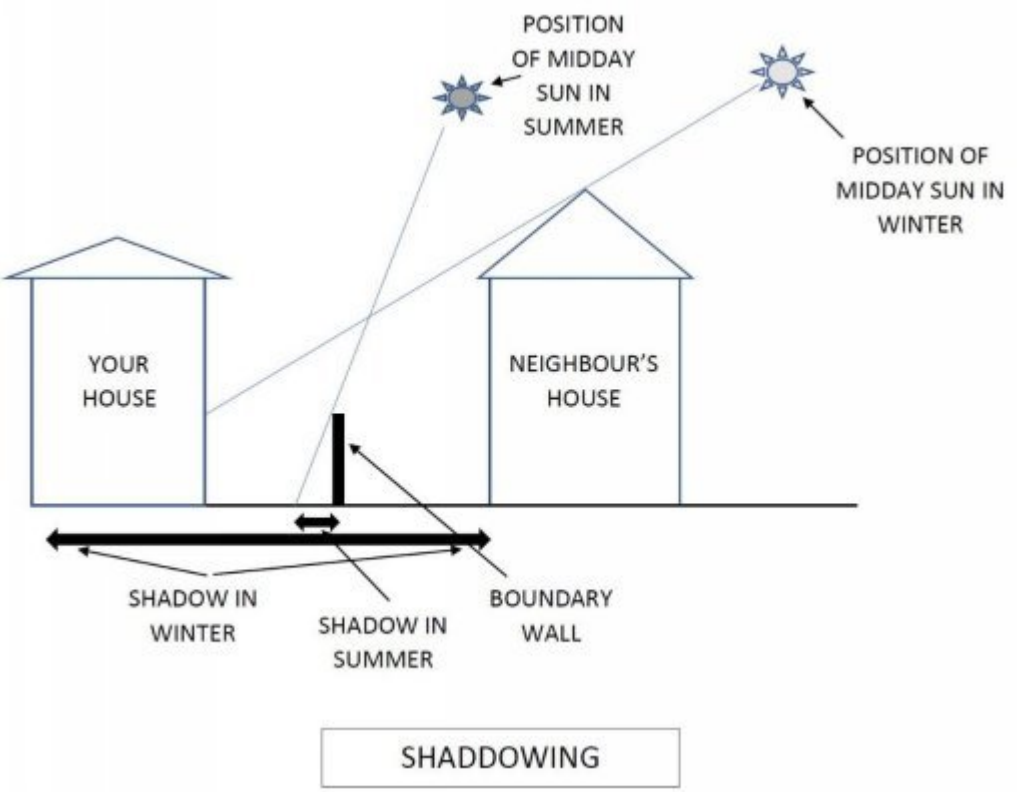
- ➢ Houses facing west have the hot afternoon sun beating against the walls and windows, heating the house, which can be a problem in hot areas.
- ➢ Usually houses in the northern hemisphere should face south and those in the southern hemisphere north, so they receive maximum sunlight and heat during the winter. It's always nice to have the outdoor living areas on this side of the house. Outdoor living areas on the opposite side of the house can be cold and dark in winter with no sun.
- ➢ Orientating houses to catch a cooling breeze is an advantage in hot climates.
- ➢ Sometimes, you want to orientate the house to maximise the views of the ocean, river, lake, mountains or the city.
- ➢ If there's space for a garden or out-door living area you'll want to orientate the house to maximise the amount of this space and so that this space fits with the internal design of the house and it's away from the road.

Orientation is affected by the size and shape of the property, by the surrounding properties and features, the slope of the property and the access to the property.



Shadowing (Daylight robbery)

Tall buildings, big trees and high mountains can all cast shadows over your property if they're close by. Those to the east could mean you only see the sun later in the morning, while those on the west can block the afternoon sun. Of course, in summer in hot localities blocking out the late afternoon sun isn't such a bad idea.



If you live in Europe, North America and Northern Asia then buildings, trees and mountains on the southern side of your property could cast shadows across your property in winter. For locations in the southern parts of Australia, Africa and South America, tall objects north of your property could cast shadows across your house in winter. In fact, in some steep valleys in the far northern latitudes properties may be in shadow for most of winter when the sun is closer to the horizon.

It's important to consider your property in all seasons. But you must also consider future developments. There may not be a high-rise building near you now, but future rezoning could change that. In particular, properties along major roads or close to rail stations could be rezoned to allow multistorey buildings. If these are on the wrong side of you then your sunlight may literally be stolen from you at certain times of the day or year.

In the same way, those small trees in the neighbouring property could eventually grow to be massive trees shading your property. Of course trees which are deciduous, losing their leaves in winter aren't such a problem in regards winter sun.

Will there be parking wars?

Parking in some inner city areas can be a problem. Often this isn't apparent on the weekend when you visit the area and it might appear that there's ample parking on the street. But, during the week street parking could be filled by workers in near-by offices. In fact, if parking is at a premium people may park on your verge or sidewalk – even damaging your garden and garden sprinkler system. On occasion you may even be parked-in by inconsiderate people parking across your driveway and garages.

Most people prefer a property which has adequate parking – either in the form of a garage, carport, or car bays. Even if you don't have a car, or don't mind parking on the street, you could find that future buyers are put off by the lack of on-site parking.

Also consider where your visitors will park.

If the property is situated next to a public parking lot be mindful that it could be used by patrons of nearby restaurants or night clubs which could be noisy when revellers get into their cars late at night.

Warmer slopes

In colder climates it's better to have a property which faces the winter sun. This means if you're living in North America, Europe and Northern Asia then slopes facing south are often warmer than north facing slopes. The reverse is the case in the southern parts of Australia, Africa and South America where northern slopes are warmer than southern slopes in winter. Low-lying areas are also often cooler.

Restrictions – why you can't always do what you want?

When buying a property be aware of any specific restrictions or regulations that may apply. Many of these can have a large impact on what you can and can't do on the property and some will add additional costs. These restrictions include many of the items discussed below.

Heritage listing – don't be caught unawares

You may consider purchasing an older property because it's affordable and you believe that the property can easily be upgraded. Alternatively you could intend to demolish the house and build a new house, or, maybe even subdivide the property and build a number of houses, or even apartments on the property.

Sometimes, you might live in an old house that requires repairs and upgrades, perhaps you're considering enlarging it by adding an extra bedroom, bathroom or garage. However, many older buildings are heritage listed. This listing will restrict what can be done to the building. It will

certainly mean that the house, no matter how bad its condition, cannot be demolished. In some cases, it may be necessary to maintain the original façade and ensure that any additions blend in with the original character of the home. This may allow the inside of the house to be changed to meet your requirements.

But, some heritage standards are so severe that even the inside of the house cannot be changed, and all repairs must be done according to the original characteristics of the house. This will require sourcing materials which match the existing building and often means finding specialist craftsmen to repair and replaced damaged areas. This is always very expensive.

Many investors have lost money purchasing property which they hoped to develop, only to find that the heritage listing meant they were unable to progress their plans. Homeowners have found costs ballooning on their renovation projects as they struggled to meet the heritage requirements. It's important to know if the house you're intending to work on is heritage listed. It's pertinent to note that sometimes whole areas or neighbourhoods could have heritage listing or restrictions on what the exterior of the house should look like.

Green building codes – not just for tree huggers

Some new estates or suburbs have building codes and rules that demand that new buildings attain stringent or a high level of greenness. This relates to how environmentally friendly the building is. (See Chapter 4.) This can include, for example, the installation of solar hot water systems, solar electricity panels, double glazing, rainwater collection tanks, grey water recycling, LED lighting, water reducing fittings and it may also preclude the use of some materials.

Although it's good practice to incorporate many of these features in the modern house it's worth noting that some of these can add significant costs and could even influence the overall design of your house.

Local bylaws – red tape, delays and more

Local planning laws could dictate:

- The distance you can build from your boundary.
- The type of boundary fencing.
- The height of the building.
- The plot ratio, which is the percentage of the property which can have buildings on.

- ➢ The control and disposal of stormwater.
- ➢ The building materials and methods that can be used.
- ➢ The visual appearance of the house from the street.
- ➢ What you can do with the verge or sidewalk in front of your property.
- ➢ The amount of off-street parking that must be provided.
- ➢ The number and type of pets you can have.
- ➢ The location of garages.

Unfortunately every town and city has their own rules, so what's allowed across the river (sometimes even street) may not be possible on your property. To complicate matters these rules are frequently changed. In some cases it may be possible to get exemptions, but often this process is only for the patient, with no guarantee of success.

Estate rules and building covenants – more rules

Some estates (housing estates) have additional rules. These can dictate when you have to build as well as what the house has to look like. Some of these rules can be quite restrictive. Estate rules could include:

- ➢ Tighter limits to the local bylaws above.
- ➢ The architectural style of the house.
- ➢ The roof covering materials and the roof shape and details.
- ➢ Exterior paint colours.
- ➢ Building materials.
- ➢ The size of house, which could be both a minimum and a maximum size.
- ➢ Where items such as air-conditioning units, television aerials and dishes are sited.
- ➢ The types of trees that can be planted.
- ➢ The positioning and sizes of windows.
- ➢ The location of refuse bins.

Case study: Recently owners in a new housing estate erected solar panels on their roof. The developer told them to remove the panels since according to the rules of the estate no solar panels were allowed to be visible from the road. For these owners it either meant the panels had to be on the roof which was shaded for large portions of the year, or they couldn't have solar panels. They had now incurred a cost to install solar panels which had to be removed.

These estates could also have rules which could make the actual construction process more expensive. Additional estate rules could limit the times when construction work can be carried out, the fencing and hoarding required around the site during construction, and the size of delivery vehicle and construction equipment that can enter the estate.

In addition these estates usually require payment of levies to cover the cost of the management and upkeep of the estate common infrastructure.

It's also important to remember that some rules can be changed. Depending on the constitution, these changes may require a simple majority, or a two thirds or more of the residents. But what it could mean is that the estate rules you thought applied to you when you purchased your property could be changed, and suddenly you are no longer allowed to keep your beloved pet, or your children can't play on your sidewalk.

Sometimes estate rules can be challenged in court, and unreasonable rules could be overridden, but obviously this involves legal fees and no guarantee of success.

Land covenants (caveats) – when your property isn't all yours

The land may have covenants (which may be shown on the property plans, registrations, or in sale agreements) which could include:

- Providing right of way for neighbours to access their properties.
- Servitudes, which is land under which utility providers and the local authorities have their gas, sewer, drainage and water pipes, or electrical and telecommunication cables. Sometimes these areas are set aside for future use – which means that one day they could move their excavators onto your property to start installing a pipe. It's not possible to build structures in areas designated as servitudes. In addition, these providers (and their contractors) will have the authority to access your property whenever a problem occurs with their pipe or cable, or to undertake maintenance work.
- Road widening reserves. Some properties may have a road widening reserve. This means that a portion of the property along the boundary with the road could be expropriated (purchased) from you to be incorporated into a new wider road. You will have no right not to sell the land at the designated price (which is normally determined to be the fair market value at that time). If a portion of your property is determined to be a road reserve you

aren’t allowed to build any structures within the reserved area. But, more importantly, should the road be widened you may find that the road and its traffic is suddenly right on your doorstep.

These servitudes, reserves and right of ways should be shown on the property plans, but if none are shown its good practice to visit the local planning offices to make enquiries. Always check where the measurements are taken from.

Flood lines (flood limits) – where you could be flooded

Properties close to rivers, or in low-lying areas may be prone to flooding. Flood lines aren’t something that are visible on the property, they are hypothetical levels where water from the nearest stream or river could reach during a flood event. The lines are usually shown on plans of the property, or on overall maps of the area. These lines are often measured as the likelihood of the water level reaching this point. So a one-in-twenty year flood line indicates that the water could reach this level every twenty years. Of course, just because the water reached this level last year doesn’t mean that it can’t, or won’t, reach the same level next year or that it won’t happen in the next twenty years. In fact, with changing weather patterns in many areas the probability of more frequent and bigger storm events is increasing. So many authorities will restrict building activities below say one-in-twenty year flood lines, even below one-in-fifty year flood lines. But also, many insurance companies will not pay for damage caused to buildings and their contents if they are constructed in an area that could be flooded, or the insurance premiums may be excessively high.

Case study: We considered purchasing a house that had a large front garden which sloped down to a small stream flowing through the park in front of the house. The house was set back right near the street. There seemed to be ample space on the property to extend the house if needed. However, on further investigation we discovered that the house could not be extended towards the river. In fact no structures could be built on this part of the property because it was within the flood line of the river.

It’s not just that you can’t build within the flood line, but you may also be unable to landscape the area, or materially change the ground levels in anyway.

I’ve seen areas flooded that you would never have thought would be flooded, since they were some distance from rivers. People then tried to

claim from their insurance policy only to find that the policy small print excluded flood damage.

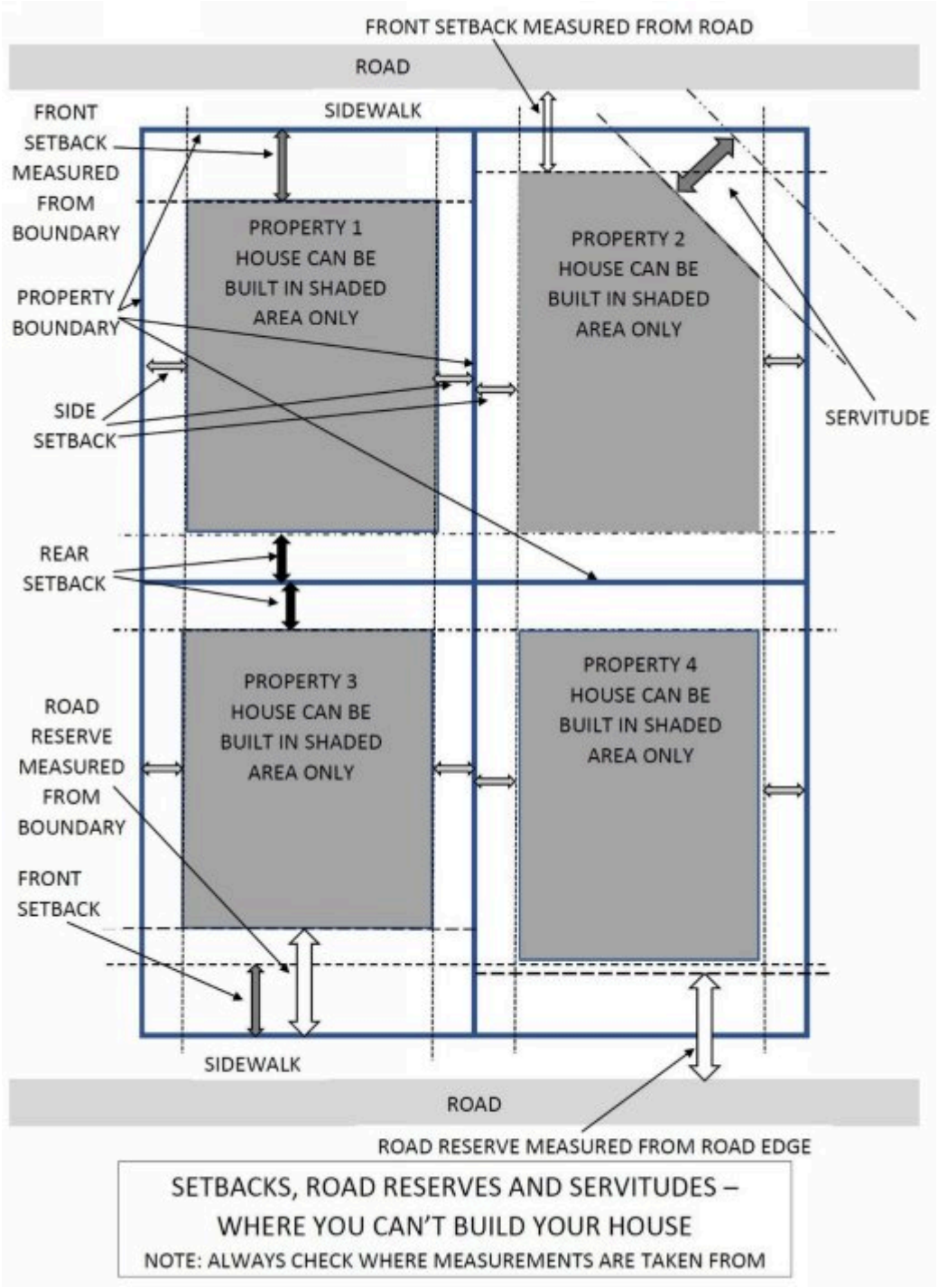
When considering any property that's close to a river (even within a couple of kilometres (miles)) it pays to make enquiries and understand the extent of previous floods in the area and their impact.

Building lines (setbacks) – not always on your boundary

Some properties, estates, towns and cities have restrictions on how close to the property boundary and the road that you can build. Often this is related to the property zoning. Setbacks could be two metres (six feet) or more on the sides. In a suburb near us the front setback from the property boundary at the road is nine metres (30 feet). This can radically impact your proposed building plans. Some regulations have larger setback requirements for the second storey of the house, which means that it has to be situated further from the boundary. Always check where the front setback or building line is measured – is it from the front boundary, or the edge of the road, and if it's the road is it from the front or back of the road kerb.

In some cases with your neighbours consent you may be able to get some relaxation of the building lines along the sides, but don't count on it.

It's important to note that the building lines or setbacks often apply to the edge of the building. So for instance, if the roof overhangs the house forming eaves, and the roof edge has a gutter, then the outside edge of the gutter will normally be the point from which the minimum distance to the boundary is measured. Of course always make enquiries as to where the measurements are taken and ensure these answers are in writing. You can usually construct swimming pools, retaining walls and driveways within the setback (that is closer to the boundary). You can plant gardens and sometimes place gazebos and movable sheds closer to the boundary.



Accessing your property – easy or a drama?

It's important to understand how and where your property is accessed, since there're often restrictions.

Steeply sloping sites can create access problems, not only for you, but also for the contractor building your new house. If materials are going to be

offloaded at the road and then moved onto the property by hand, or in smaller vehicles, this will add to construction costs.

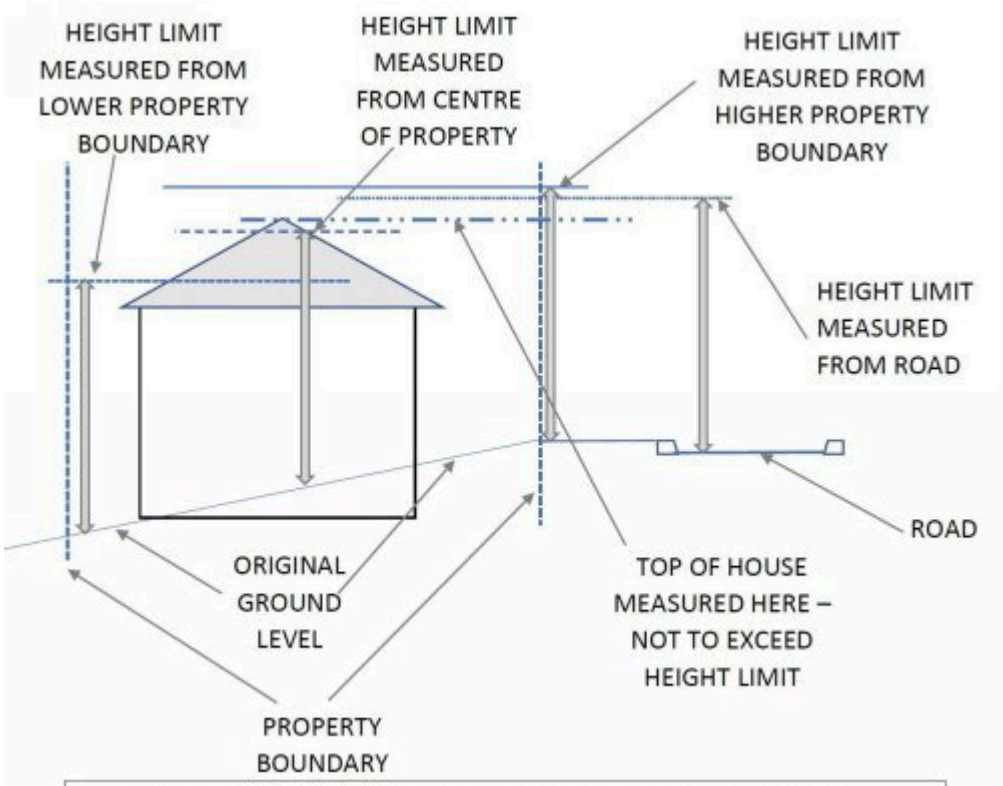
If you're purchasing an undeveloped property don't assume you'll be able to construct the driveway, or garages, in the position that best suits your needs. Often the location of driveways are impacted by numerous items which could include the location of power poles, water meters, street lighting and trees on the sidewalk. In most cases the authorities will resist relocating these to make way for your driveway, and it can cause delays and involve costs to argue the case for them to move the items, and then, if your application is successful, further costs to pay for the relocation. The roads authorities also won't grant access for driveways to meet the public roads where these could be a hazard, such as in proximity to intersections, blind corners and rises, or where traffic conditions are changing, such as merging traffic lanes or turning lanes.

In some older suburbs properties may have been subdivided and access is through another property. However, this access may never have been formalised, meaning that the owner of that property could at any stage stop you accessing your property through their land. This may be because they're tired of you driving on their property, but in many cases it's because they've decided to extend their existing house, or build a swimming pool or other structure which will then block your access. This creates a problem which may have to be solved by you purchasing the accessway from your neighbour (often at their price) and will also require council approval, which could be declined depending on the zoning and size of the properties allowed. The agreement will have to be formalised in a legally enforceable document at additional costs. So, make sure that the land currently occupied by the driveway entering the property is part of the property. Check the plans.

How high can you go?

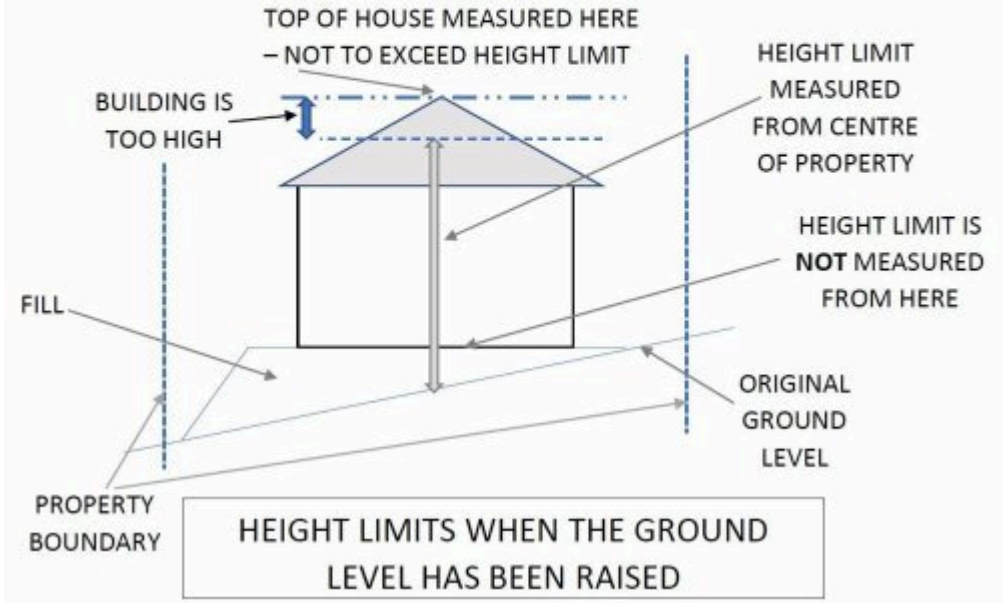
Most town and city councils have building height limitations. These are normally included in the zoning regulations. In general, if you're only planning a single or two floor residence this isn't a problem. However, it can be a problem for houses built on sloping properties. It could also be a problem if you're planning a house with high ceilings, or perhaps you're planning a steeply pitched roof, or require a roof that's higher than the norm.

It’s important to understand where the height limitation is measured from since it’s measured from a particular point on the property, which may be the street entrance. In fact, sometimes it even depends on the existing ground levels on the neighbouring properties, which if these are lower than your property already places a disadvantage on the height of your proposed building. More than one builder had to alter the plans and elevations of their building to conform to the local height restrictions.



KNOW WHERE THE HEIGHT LIMIT OF THE HOUSE IS MEASURED FROM ON YOUR PROPERTY

IS IT FROM THE ROAD, FROM THE CENTRE OF THE PROPERTY (MEASURED FROM ORIGINAL GROUND LEVEL), AT THE HIGHER END OF THE PROPERTY, OR THE LOWER END OF THE PROPERTY?



HEIGHT LIMITS WHEN THE GROUND LEVEL HAS BEEN RAISED

In some cases, you might want to increase the height of your house to maximise the views from it. Again height restrictions may limit what you can do.

Of course, sometimes these height restrictions work in your favour. You may have views which you don't want blocked out by another house in front of you. Understanding the height restrictions on the block of land in front of you will enable you to know if your views could be blocked out by your neighbour in the future. It could also limit the height of neighbouring buildings – all assuming the restrictions aren't changed in the future.

Vegetation – that forest could be a nightmare

We might think it's a good idea to buy a property which has large mature trees. However, clearing vegetation can be expensive and sometimes difficult. Some neighbourhoods require permits to remove large trees. These permits may not be granted, or you may have to replace the tree with another similar type and size tree which could be expensive. When large trees cannot be removed it means that the new house or extensions have to be planned around the tree.

Some trees have invasive roots which can damage water and sewer pipes as well as causing structural damage to the house.

Some trees can be hazardous, dropping large branches which could damage your property and even your neighbour's property. Large trees are often a source of conflict between neighbours since shedding leaves block gutters and drains and leaves need to be continually cleaned from gardens and pools. Branches have to be pruned where they interfere with power and telephone lines. Large trees also block light, and even prevent lawn and other vegetation from growing beneath them.

It's pertinent to remember that existing trees may still be growing, so a tree which isn't a problem, even appearing to be a nice feature of the property, can later grow into a very large tree which dominates the whole property, shading it and causing problems.

Once the house is built it often becomes difficult to prune or fell large trees.

In areas that are prone to bush fires vegetation could be a fire risk, so sometimes there're requirements to ensure there are adequate fire-breaks around the property which have to be maintained every year.

Some trees, even after being cut-down, continue to grow and need regular treatment with new shoots sprouting up across the property.

Example: After cutting down a small shrub only two metres (six feet) high we had new shoots growing out the ground for over two years – some of these were eight metres (eight yards) from the original plant.

Some trees suck lots of water from the ground, actually lowering the level of the underground water. When the tree is removed the water table rises and this could cause the ground to settle, or in some cases even become boggy.

Large tree roots left in the ground after trees have been cut down eventually rot leaving voids, causing the structures built over them to settle and crack.

Connection points for power, water and sewage

New houses need connections to the local sewer system, water pipes, gas mains and electrical cables, unless you're planning to be entirely self-sufficient. It's important to know where the connections are. On larger properties, if the connection points are far from the planned position of the new buildings there will be added costs of additional pipes and cables.

The location of sewerage connections can be problematic since pipes from the new house have to flow downhill to the connection. If the connection is far from the planned exit point of the new building, then the system might not work if there's insufficient fall height available, or alternatively an expensive pumping system will have to be installed to get the sewerage to the connecting point. Sewerage connections can also be problematic if the planned exit points from the building, or extra bathroom, are on the opposite side of the house to the town connection. The extra length of pipes required to get around the house to the connections could mean that there's insufficient fall on the pipe. This could mean the extension isn't viable, or that the building has to be redesigned so the sewer pipes exit at a closer point to the connection. (See Chapter 4.) It should be noted that if sewer pipes, electrical cables or water pipes pass under the building they may require additional protection, such as encasing them in concrete. However, in general this practice is discouraged since they should be accessible so they can be repaired or replaced should a fault or blockage develop.

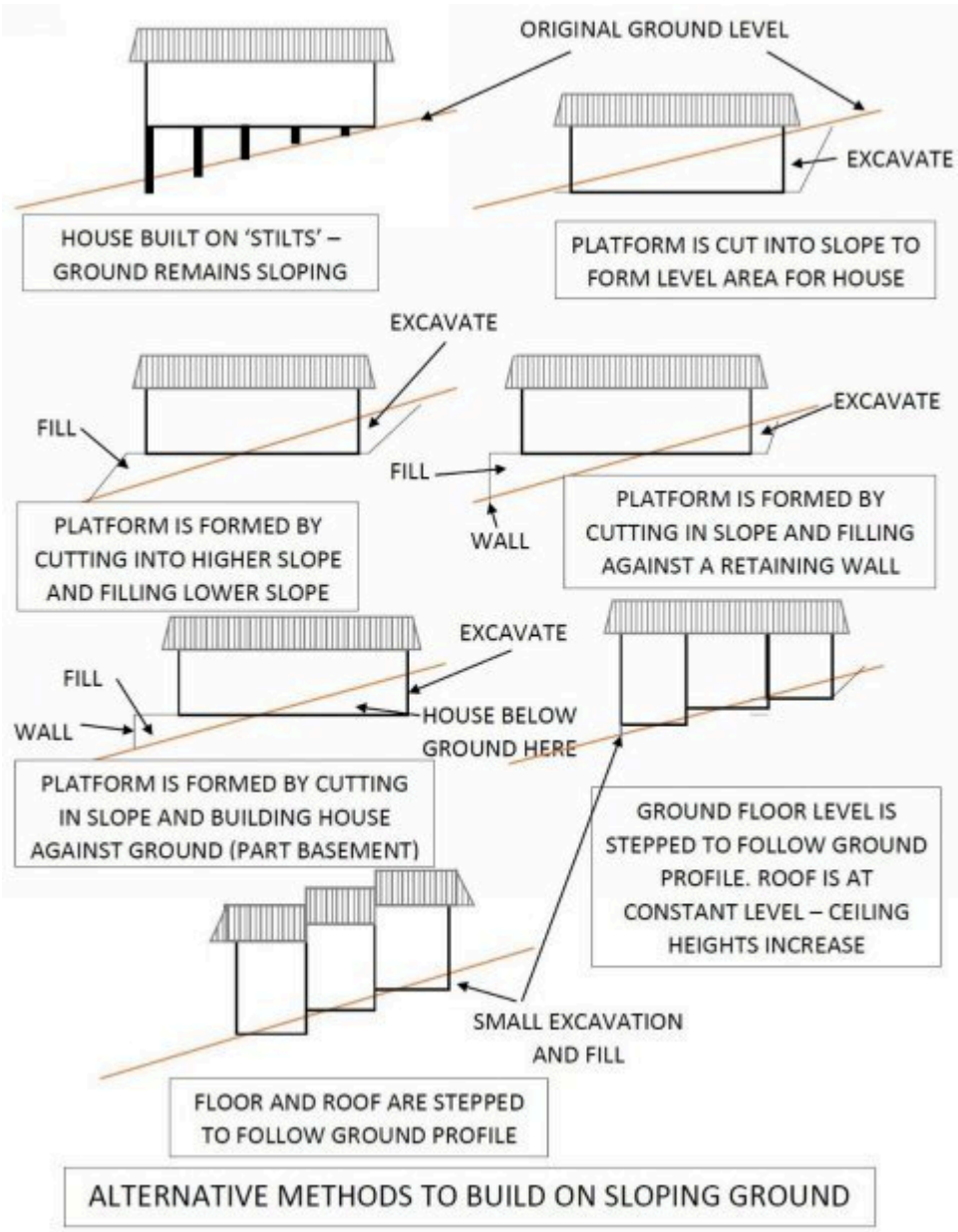
Utility providers may require a specific type and design of water, gas and electrical meters and these usually have to be placed on the property where they can be readily accessed by the authorities.

The cost of building on steep slopes

Steeply sloping ground can add to building costs since usually the area under the house has to be levelled, which could entail bringing in additional ground, or it could mean excavating into the slope to create a level platform. But creating a level area may also require retaining walls to be constructed to hold the banks or sides of excavations up. These walls can be costly and also unsightly. An alternative to reduce the amount of earthmoving is to design the house so that it has steps and that the various rooms are built at differing levels to accommodate and follow the sloping ground.

Sometimes semi-basements can be constructed which are built into the slope to minimise the filling.

Another solution is to build the house on stilts or columns so that the floor of the house, which is level, overhangs the sloping ground. The columns get longer further down the slope. This can be expensive, especially if the columns and house floor are constructed of concrete.



But a steeply sloping property can create other problems which could include:

- ➢ Vehicle access to street level is difficult, and in particular vehicles with a low ground clearance could become stuck, or scrape on the driveway where it meets the road.
- ➢ Construction vehicles may have difficulty accessing the property, making construction more expensive if materials have to be moved from the road by hand to where they're needed.
- ➢ Connections to the main sewer lines will be impossible if the existing town pipes are at a higher level than the lowest exit point

from the planned house.

- ➢ Houses built below road level could be subject to flooding from stormwater from the road, or even from higher neighbouring properties.
- ➢ Maintaining a garden on a steeply sloping property is often more difficult than level properties.
- ➢ Many people don't like purchasing steeply sloping properties, or houses with lots of steps, particularly if they are elderly or have mobility problems.

An advantage of building on steeply sloping ground is that if there's a view there's a possibility that the house in front of you will be lower and won't obscure your view.

The property has already been levelled – that must be good?

Sometimes the developer or owner has levelled the property. Great they've saved you some money! But have they? Your house must be built on firm ground. If the ground on the property has just been pushed in with no compaction you're either going to have to dig all the loose ground out and fill it back in by compacting it in layers, or you're going to have to excavate the foundations to a depth where you reach solid ground. Either way it's going to cost you money.

But, sometimes developers level sites for more sinister reasons. The area may have been swampy, or it was a rubbish tip, and they've simply covered it over. You don't want to be building over a swamp or a rubbish tip because it's going to cost you more to construct solid foundations, or you could have a house that settles and cracks later. Maybe they've covered over rock which was previously visible.

Some developers may have levelled the area using unsuitable ground from their other projects. This could even include building rubble and hazardous waste. This ground will have to be removed and gotten rid of, or you may require more expensive foundations to accommodate the unsuitable material.

Always be cautious when buying a property that's already been levelled. Ask neighbours what was there before it was levelled. Test the firmness of the ground. If in doubt call a geotechnical engineer for advice – a couple of thousand dollars could save you lots of money later. But a well compacted levelled site is beneficial.

When a property has already been levelled and there's a building height restriction, always understand where the height is measured from, which could be from the original ground level and not measured from the levelled area. This may impact the height of your house, especially if the property has been filled and levelled higher than the original ground level.

Are you building on rock or sand?

Ground conditions can have a dramatic impact on the cost of construction. Some ground requires special foundations such as piles. Collapsing sands, acidic ground and heaving clay all require special foundation treatments and failure to take these conditions into account will likely lead to severe problems with the building later.

Rock provides a sound foundation, however excavating in rock can be very expensive and time consuming, so construction of basements and installing services such as sewer pipes, electrical cables and water and gas pipes is costly. Of course planting a garden on rock is almost impossible unless you're happy to use the rock as features, or are prepared to import tons of topsoil to cover the rock.

Generally building in areas of limestone should be avoided because sinkholes can appear, and in some cases whole houses have disappeared.

Building above active or old mine workings can cause cracking and subsidence of buildings.

Ground water – you don't want to build in a swamp

Ground water presents a number of potential problems if it's near the surface.

- ➢ It might flood excavations for foundations which could slow construction.
- ➢ Constructing basements and pools require additional construction costs to keep the excavations dry.
- ➢ High water tables can cause below ground pools to lift out of the ground when the pool is drained, unless it been specially designed to prevent this.
- ➢ During the wet season the water table could rise even further, making parts of the property boggy.
- ➢ High water tables could preclude the use of septic tanks and French drains which are required if there're no town sewer connection available.

➢ You may have to construct additional drainage systems.

Of course with a high water table you may be able to easily sink a well or a bore (providing you're able to obtain a permit) so that you have your own source of water.

The water table varies according to the weather. The property could appear okay in the dry season, and sometimes even in the wet season after a prolonged drought, but in very wet seasons the property could become marshy. Property close to rivers and lakes, as well as those in depressions or very flat areas could be problematic. Looking at the type of vegetation may provide a clue to potential wet ground.

The cost of hazardous materials

Many older properties contain asbestos. This has to be carefully removed and disposed of in a designated location when the house is demolished or renovated, which is expensive and could delay the project while permits and specialists are arranged. Even garden sheds and fences sometimes contain asbestos.

Some houses are built on old landfills, or on land which was previously an industrial property where hazardous or toxic chemicals or fuels were stored or spilled on the ground. Any contaminated soil will have to be carefully removed and dumped at a designated toxic dump which is expensive.

You could even find that the previous resident conducted a business or hobby which caused them to spill oils or fuel on the ground, causing contamination that has to be cleaned up.

What's on the sidewalk? (Light & electric poles or bus stops)

Light poles, electrical supply poles and even bus stops on the sidewalk can impact the property.

- ➢ They'll restrict where the driveway to the property can enter the road. Moving these items is usually difficult and always involve additional expenses. In many cases they just can't be moved.
- ➢ They are unsightly and could detract from the value of the property.
- ➢ Bus stops often result in additional noise and litter, and sometimes even vandalism (there's no knowing what bored schoolchildren could get up to while waiting for their school bus).
- ➢ Streetlights could shine into bedroom windows.

Noise, dust, odours and fumes – what will the wind bring?

Case study 1: Several years' ago a new ocean marina was constructed so the properties had their own boat moorings. Great idea – except the marina involved constructing a breakwater into the ocean. This blocks the ocean current coming up the coast and means that when winter storms rip up seaweed the seaweed is deposited against the breakwater in heaps several metres (feet) thick. Eventually the seaweed rots and an awful smell hangs over the area for several weeks and months until the authorities remove the seaweed – which is an expensive operation.

Case study 2: As our city grows new suburbs and estates spread ever outwards. Some of these are now encroaching on industrial areas, one of which has a cement factory. The new neighbours of this cement factory are now upset because when the wind blows from the factory their houses are covered in a mixture of coal and cement dust and they get the fumes from the burning coal.

Case study 3: We live about a kilometre (half a mile) from a railway station. Some nights we don't hear the trains, while other nights we hear them clearly, depending on the direction of the breeze.

Many areas near airports can be very noisy. Sometimes houses several kilometres away are impacted by the noise of aircraft overhead. But, some days there might be no aircraft flying over. Airports have different runways which are used depending on the direction of the wind. Often the direction of the wind depends on the time of day or the season. When you visit the property it may appear quiet, while on other days, or at other times of the day there's one aircraft following another, starting early in the morning and ending late at night.

Unfortunately, we can't always know what odours emanate from factories and waste dumps in the area. They could be several kilometres (miles) away and as long as the wind isn't blowing from that direction it's fine. But, when the wind changes you can literally be stunk out of your own home. Yet, it's not just factories and dumps that give off awful smells, even idyllic locations by the ocean, lake or river can turn into cesspools when algae blooms, dies and rots. The smell can hang around for weeks.

Dust can be a problem from ship and train bulk loading terminals, from mining operations and waste dumps.

If there’s an industrial area, airport, port or mining operation within five kilometres (three miles) you need to carry out further investigations. What fumes, smells, dust and noise emanates from the operations? What’s the direction of the prevailing winds? Talk to the neighbours and try and visit the property at different times, even different seasons. If you’re contemplating an idyllic property by a lake or ocean be sure that the prevailing winds aren’t going to be washing up dead seaweed and algae onto your shores.

Flooding – will you be under water?

Flooding doesn’t just come from rivers. Always consider what will happen to stormwater when there’s heavy rain. Is there a possibility that it could run from neighbouring roads and properties through your property? Could it collect in your property if the existing stormwater drains become flooded or blocked?

Any low-lying property could be at risk of flooding during heavy storms.

Taxes and utility costs

Local taxes (rates) and utility costs vary significantly between suburbs and towns. The taxes will also vary according to the size of the property and its zoning. Always check what the rates are for the property and compare them with other areas.

Does your family agree?

Inevitably the choice of property won’t suit everyone in the family who often have their own needs and desires. However, it’s important to consider everyone’s future needs as well. So, being close to your work may be a priority, but will you always work with the same company in the current location. Being close to your kids’ school may be important now, but if they only have a few years of school left, then maybe some inconvenience now may be worth it with the long term advantages of another location.

Selecting the property that best suits your needs could turn your dream home into a continuing nightmare if your partner absolutely hates it. You should be considerate, you need to understand the other side, you should understand the fears and desires of your partner. Again, common sense and a logical approach must be taken to weigh up the pros and cons, and to argue the best property for you and the family in the long term.

Can you imagine your dream home here?

Walk the property and imagine your home there. Use the compass on your phone to understand where the sun rises, where it sets and how it travels across the sky in summer and in winter.

Imagine where your front door will be, how you'll fit your garages in, where will the kitchen be, what will you see from your living room. Place your bedroom and the children's bedrooms. Can you imagine your style of house fitting into the property? How can you make the most of the property's good features? Is there anything that could impact the layout of your house?

Does your home and lifestyle fit comfortably into the property and area? Is this a neighbourhood that your family will enjoy?

Can you afford the price?

Unfortunately we all have a budget to work to. It's very tempting to purchase the property that appears to be ideal. But, if it's more than you can afford then you either have to look at cutting costs elsewhere, or you must forget it and look for another property. Frequently people get fixated on one property that's just too expensive for them. They look for every excuse why other properties can't work and every justification why this property is the one to have. Regrettably we can't always have exactly what we want. Only small compromises might be necessary to make a much cheaper property work for you.

That dream neighbourhood could turn into a nightmare when you can't pay all your bills, or because you have to cut back on your house plans when the property cost has eaten a substantial portion of your budget.

Of course, don't just buy a property because it's cheap or fits your budget. Understand why it's cheap. Ensure the property will fit your needs.

Summary

It's important to carefully look around and choose the most suitable piece of land for your dream home, that will suite your and your family's needs, meeting most of your requirements, without breaking your budget. Buying into the right area at the right time can be a valuable investment. But, buying in the wrong area, or a property which has difficult building constraints can be an expensive mistake.

You probably feel totally confused after reading this chapter. So many points to consider! There will almost never be the perfect piece of land that suits both you and your family. Tick off the items in the chapter which are

the most important to you and your family, then consider only those items, listing the pros and cons of each property. Some items need additional money, so put an estimate to the costs involved. I'm not saying don't buy a property that's steeply sloping or is covered in rock, just know what the extra costs will be to construct your house there, and factor these additional costs into your budget.

Sometimes paying a higher price because the property is close to the city centre isn't worth it, especially if land a few kilometres (miles) out is substantially cheaper.

It's always important to make logical and rational decisions and not buy into an area simply because it's the 'in' suburb to live in. But, ultimately you and your family must be happy living where you eventually decide to settle.

Do your research diligently. Visit the property at different times of the day and on weekends as well as weekdays. Never believe everything that the real estate agent (seller) tells you. Do your own investigations. Talk to neighbours. Visit planning departments. Consider what the site will look like in other seasons.

Your checklist for making a decision to buy the land could include:

- ➢ Is it a good location – one that suits your family's needs?
- ➢ Is there public transport nearby?
- ➢ Are there good schools in the area?
- ➢ Where will you buy groceries?
- ➢ Will the suburb grow? Will suburbs around this area grow?
- ➢ Is the site serviced by good and reliable infrastructure?
- ➢ Are there plans for new roads, railways or powerlines which could impact the property?
- ➢ Are the surrounding properties small, which could mean the neighbouring houses are constructed on top of you?
- ➢ What's the zoning for the area and could this change in the future? Would there be benefits to these changes, or could they cause the neighbourhood to be spoiled?
- ➢ Is the area safe?
- ➢ If you like the property because of the views, are these views safe from being obscured later?
- ➢ Does the property allow you to construct a house that's orientated in the best direction?

- Is the shape of the property suitable to fit your house on?
- What impact will your neighbours have – their buildings, trees, hobbies and habits?
- Will there be sufficient parking?
- What's the value of the surrounding properties? Will they add or detract from the value of your finished house?
- Is the neighbourhood stable, or could it undergo changes in the next few years?
- Will the property be in shadow at certain times of the day, or in different seasons? How will this impact you?
- Is the property heritage listed?
- Are there height restrictions which could impact your planned house?
- Do you understand the local planning bylaws?
- Are there special rules and covenants that apply in the estate or suburb which will impact your house and lifestyle?
- Are there specific covenants in the property title deeds?
- Can your contractors and material suppliers easily access the property?
- Has the property got trees? Can trees in the way of the building be easily removed? What will the cost of removing the vegetation be? Maybe the trees are an asset to be retained?
- Will it be easy to connect to the town electricity, water and sewer lines? Do you understand the costs?
- How will the location of existing pipes and cables impact your house and the construction processes?
- What's the ground (soil) on the property? Will it require expensive modifications to build on? Is there rock which could make excavations expensive?
- Is the property wet or boggy? Will it get wet in the rainy season? How will this impact construction as well as living there?
- Is the land steeply sloping? How will this impact the design of your house? How will it impact construction?
- Are there right of ways or road reserves which could restrict the use of certain areas of the property?

- ➢ Are there light poles, electric pylons or bus stops which could restrict where you access the property, or which hinder construction?
- ➢ Are there any hazardous materials on the property?
- ➢ What are the building setbacks and how will they impact your house design?
- ➢ Could the property become flooded? Are there areas on the property where you can’t build because they’re within a flood area?
- ➢ Does your family like the property?
- ➢ Do you have any reservations or concerns about the property?
- ➢ Can you afford the property?
- ➢ Can you imagine your home fitting in the property and neighbourhood?

Chapter 3 – Renovating Your House

Renovations range from minor cosmetic touches, like repainting a house, through to bigger changes, including redoing paving and constructing pergolas and verandas. Then there are more major changes such as extending the house by adding additional bedrooms, bathrooms and garages. More complex and major changes could include structural changes and even adding an additional upper level.

Sometimes these renovations are done in stages to match time and budgets, while occasionally they're necessary because of changed circumstances (an extra child arrives, elderly parents move in, or you've got older and are less mobile). Often they're a necessity because items have become worn, structures have weakened, the house has leaks (in the roof, around windows and even through walls) and cables and pipes have become non-compliant. Of course, frequently renovations are done because you've decided you don't like things as they are, you would like an extra bathroom, you want a different colour scheme, or you want to upgrade and modernise your home.

On occasion, investors purchase older houses and carry out renovations to make them smarter, newer, more upmarket, with additional bathrooms and bedrooms, so that they are more appealing to buyers and they can then sell them at a profit.

Sometimes you even decide you want to move to another house or area, maybe upsize or downsize, but in order to make your house more appealing to potential buyers you've decided to make some changes and improvements.

Even minor cosmetic changes can make a huge difference to the value of the house and to your enjoyment of the property. (See Chapter 6.)

Restrictions – what could impact your plans?

There are restrictions which could limit what you can and can't do and what you can change in an existing house. These include:

➢ Physical restrictions including:

- The location of sewer pipes which could be in the way of a planned extension. The location (including vertical alignment)

could impact where new bathrooms, laundries and kitchens can be added and even the position of toilets, bathtubs and sinks.

- The layout of the current house.
- The structural integrity of the existing building. See later.
- The design of the existing roof. Modifying an existing roof is often costly and can result in leaks and colour and material differences. Extending an existing house is cheaper and easier if it can be done without altering, or tying into the existing roof.
- The materials incorporated in the existing building. Can you match them? Are they still available? How do you join the new to the old?
- The topography of the property. Sloping sites require level areas to be created for the extension, which require ground excavations or filling with earth.
- The foundations under the existing walls. These foundations may prohibit, or make it problematic, to add on another floor or storey, or could make it difficult to relocate internal walls.
- The location of the current building on the property. Is there space for the planned extension?
- The current architectural design of the house. The alterations, changes and additions should generally match the existing architectural style of the house, or the existing style (interiors and exteriors) need to be modified so there's a coherent design flow. For instance, adding a modern cutting edge extension to a Victorian existing design in most cases will result in a mismatched poorly coordinated design. So matching a modern extension with an existing vintage house could require extensive modification of the existing fixtures, fittings and finishes (at additional costs) to maintain continuity. Having said this though, clever architects have managed the transitions with sympathy and good effect.

➢ Local or council bylaws and estate rules as discussed in the previous chapter.

➢ Heritage listing – As discussed in the previous chapter heritage listed houses limit what can be done on the exterior of the house, and in some cases depending on the type of listing, could even

restrict what can be done internally. Heritage listed properties can be very expensive to change.

- ➢ Neighbours' objections.
- ➢ Access for construction.
- ➢ The requirement to continue living in the house.
- ➢ Your budget.

Sufficiency of existing plumbing and electrical

Sometimes, what appears to be a minor renovation can become costly if it's found that the existing plumbing, gas or water pipes and electrical cables aren't up to code and specification. For final approvals to be granted the plumbing and electrical networks for the whole house may have to be upgraded. In addition, it's also important to confirm that the existing power and water supply is adequate to supply the additional facilities. If it isn't it could involve installing bigger connections, cables and pipes. Before embarking on a renovation project it may pay to have experts assess the current plumbing, gas and electrical systems to confirm that they meet regulatory requirements and that they can supply the extensions.

In particular, look at hot water systems which might be too small or might be far from where hot water is required, meaning the water cools as it traverses the lengthy pipes supplying the new bathroom. Lagging or insulating the hot water pipes can help reduce the problem.

Often a lack of water pressure is a problem, especially if the existing supply pipes are small, or when the renovation involves building upwards.

Sometimes, pipes and electrical cables are in the way of the extension and have to be relocated at additional cost.

The soundness of existing structures

It's pointless renovating the inside of your house if the roof leaks. You could recover the roof but that might only be a temporary fix if the roof timbers are rotting and need replacing. You could think that patching those cracks and repainting the wall will make the cracks vanish – well they may vanish for a time, but, if the foundations are moving the cracks will probably reappear.

In addition, you need to have the foundations and floor slabs assessed if you're planning on constructing additional walls, or building upwards adding another floor, to ensure that they can take the extra loads. Ceilings need to be strong enough to support the new ceiling fans or chandeliers you're planning to install.

Unfortunately, more than one renovator has had their budgets destroyed because costs escalated when it was found that structures and foundations needed to be replaced or strengthened so that the new renovations could be completed.

Existing mould, dry rot and termite infestations could be hidden problems that are uncovered during renovations and which require rectifying.

Structural modifications – don’t bring the house down

Often the first thing we want to do is chop out internal walls to change the size of rooms and the configuration and layout of the house. Unfortunately, some of these walls may be holding up the roof or the floor above, so removing them will cause the roof or upper floor to sag, or worse, even collapse. In some cases it’s possible to put in extra permanent supporting structures for the roof or upper floor, but these should be designed by and engineer and installed before demolition work starts.

Even cutting additional doors and windows, or enlarging the existing windows can weaken load bearing walls. Additional beams may have to be installed to transfer the loads over the openings. The remaining portion of the walls must be checked to ensure that they’re able to carry the additional loads from above.

All buildings are supported by some form of foundation. The detail of the foundation will depend on the ground on which the structure is built, as well as the load that the foundation must carry. If the building is on rock the foundations may be light, while buildings on weak ground will have more substantial foundations even including reinforcing steel. It may appear easy to demolish an internal wall and rebuild it a few centimetres (inches) away, but if the new wall isn’t constructed on a foundation and only on the existing concrete slab there will be problems if the concrete slab has insufficient strength to support the new wall. The concrete slab could crack and the wall settle and crack. This is not only unsightly but can be dangerous.

Sometimes foundations aren’t only there to support the structure but they also have to hold the structure down. For instance, a house made of lightweight materials in an area prone to hurricanes, tornedos and cyclones must be firmly anchored to the ground. Cutting or removing anchors and columns could weaken the structure.

Chopping out an internal wall – not always straightforward

It seems so simple – cut out an existing wall to make a room larger, or to create open plan living areas. But there're issues you should consider which could add to your costs. These include:

- ➢ Is the wall load bearing, supporting the structure above? (See the previous section.)
- ➢ Are there pipes or electrical wiring in the wall which have to be accommodated elsewhere? These need to be isolated, made safe and then relocated as necessary.
- ➢ Will the floor levels on the two sides of the wall be the same? If the floors have been constructed separately it's feasible that they aren't perfectly level and even though they are the same level at a connecting doorway they might be different elsewhere. Even a level variance of five millimetres (a fifth of an inch) can be a problem when you try join the floors after the wall is gone.
- ➢ Will the ceilings be at the same height between the adjoining rooms? Ceilings may not be exactly level across the room and you may find that that the ceilings don't perfectly line-up. Even a five millimetre difference (fifth of an inch) may result in you having to redo the ceiling in one of the rooms.
- ➢ Will the floor finishes match? Replacing carpets may be simple, but tiles involve more work. Even when the tiles match at a connecting door between the rooms they may not match further along when the wall is removed. It's possible that the tile pattern in one room isn't perfectly square, or the joints between tiles are fractionally larger. This may result in tile patterns mismatching further from the door when the wall is removed. But anyway you'll probably always be left with a patch in the floor and inevitably it will be best to replace the tiles or carpets in the newly enlarged room so that it looks right and professional – a cost that you must allow for in your budget.
- ➢ Will the walls at right angles to the wall that's removed line-up between the adjoining rooms? Sometimes one wall could be slightly out of square or a few millimetres thicker, which could mean that once the wall is removed the adjoining walls don't join perfectly flat. You can manage this transition by including a small nib where the wall you removed joined the other walls.

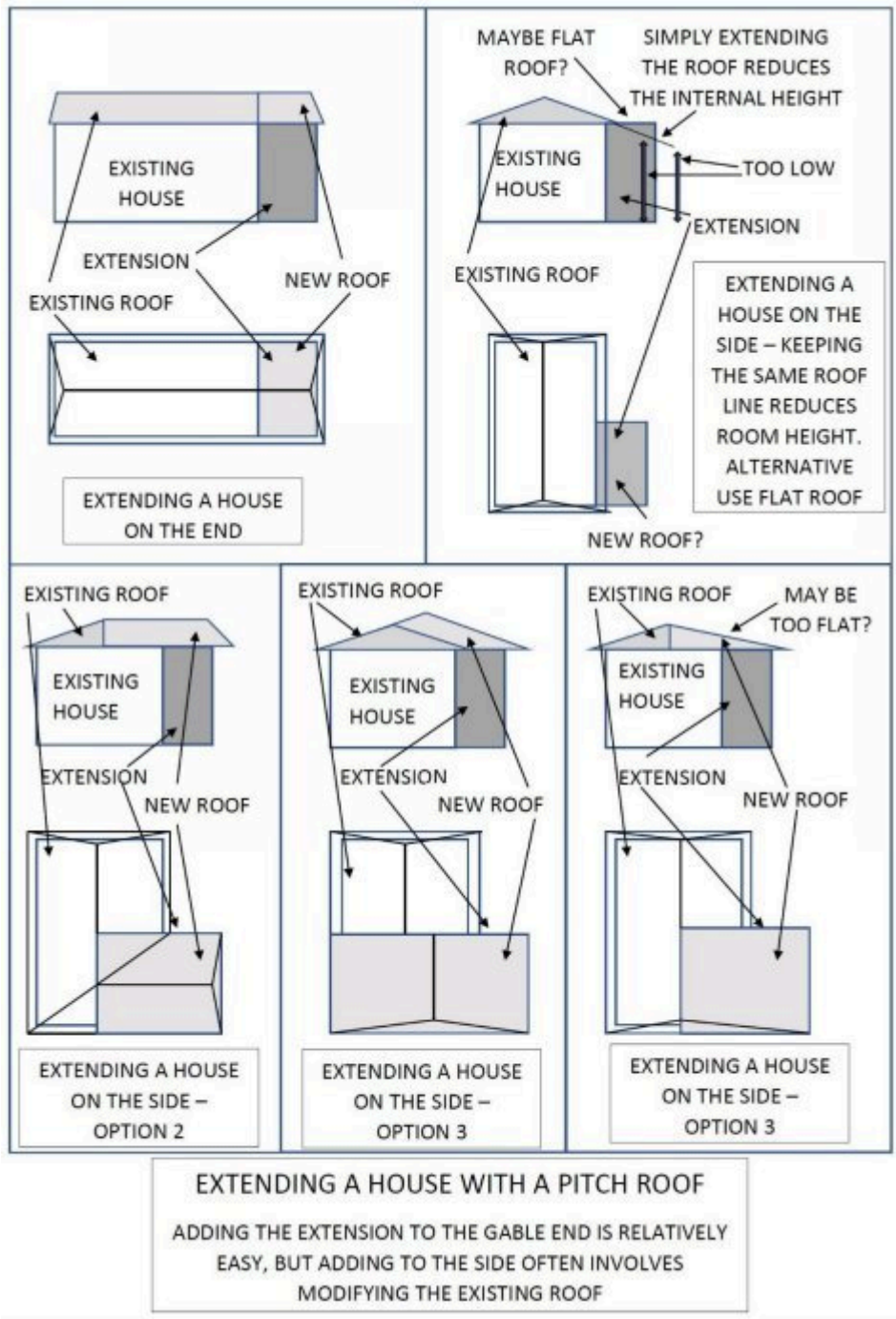
- ➢ Usually lights have to be changed so they are controlled by one common switch. Lights mounted in the ceiling may have to be relocated so they are placed evenly and symmetrically across the enlarged room. This may entail minor repairs to the ceiling.
- ➢ Ducted air-conditioning may have to be modified so there is one control for the room. The ducts feeding the two rooms could have to be combined to take account of the new enlarged room.

All of the above modifications should be allowed for in your budget and the construction schedule.

Extending outwards – what you should consider

It may seem simple to extend your house, adding another bedroom or bathroom, or enlarging an existing room. But, it's not always as simple as building a few additional walls and extending the roof. There may be additional complications which could add to the costs.

- ➢ Existing external sewer pipes, electrical cables and water pipes which are in the way of the new extension have to be rerouted, or protected. Rerouting of sewer pipes might not be feasible and will depend on the available falls of the pipe. (See Chapter 4.)
- ➢ Walls that have to be removed or cut so that the new extension can connect to the existing building will have to be checked to assess their structural integrity and to ensure there aren't pipes and cables within the section of wall that's to be removed.
- ➢ Connecting the roof of the new extension to the existing roof is often the biggest obstacle. Adding to a flat roof, or the gable end of a pitched roof is simple, but extending a pitched roof outwards in the direction of the slope usually requires an extensive modification of the existing roof.
- ➢ The external finishes of the new walls usually have to match the existing external walls.
- ➢ If the property is steeply sloping, then depending on how the ground slopes, you may have to excavate and remove ground or fill and raise the ground levels to fit the new extension. Alternatively, you could have the new extension at a higher or lower level than the existing floor levels and have steps leading up or down to the level of the extension. If the floor level of the extension is raised this will create problems with connecting the roof of the new extension to the existing roof.



- ➢ Gutters and downpipes (downspouts) may have to be altered or added to accommodate the changed roof profile.
- ➢ Obviously the extension must be within the building lines of the property.
- ➢ The external façade of the house will be changed. This could alter the existing symmetry of the house. Care must be taken that the

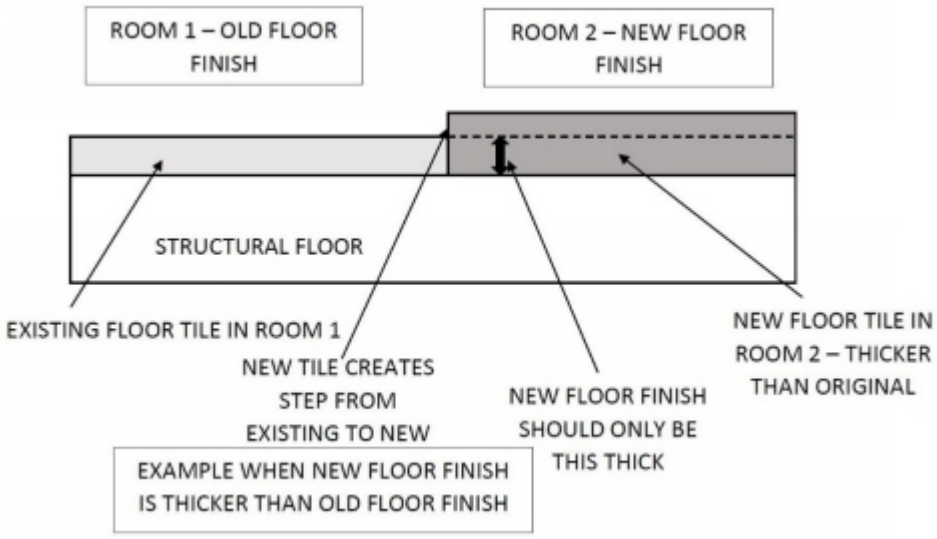
new extension doesn’t look like an ‘add-on’ and that it blends with the existing profile and façade of the house.

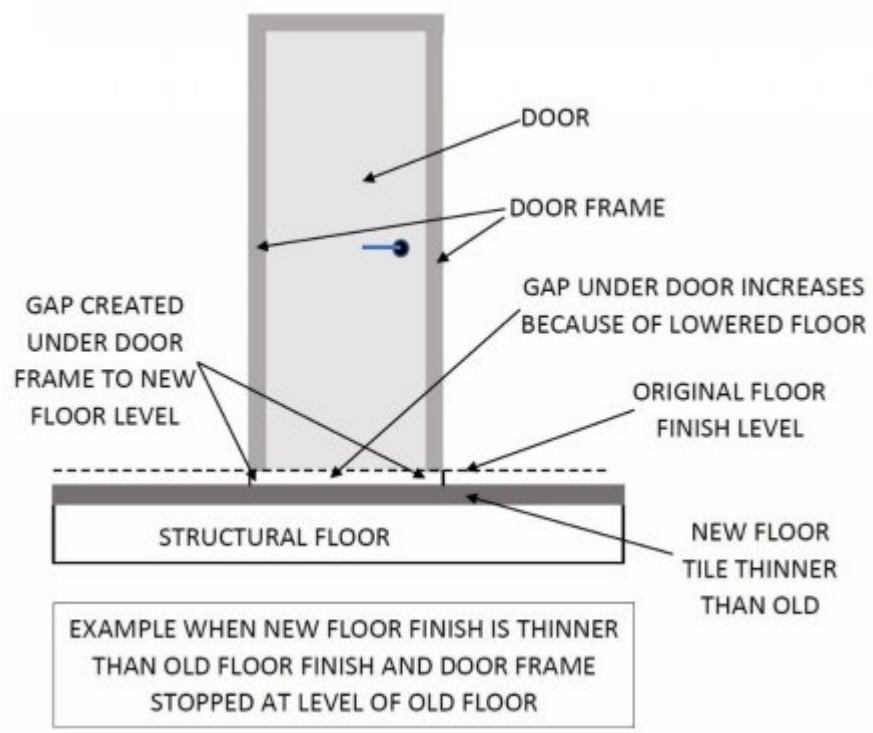
Connecting to the existing

Adding on new structures to an existing building poses a number of challenges.

- Floor levels should preferably match. Where there are steps between the new section and the original building these need to be planned so that the size of the stair treads and risers are a consistent size that match the recommended comfortable and legal stair sizes.
- It’s often difficult to match the existing finishes – particularly face bricks, textured render work, floor tiles and timber flooring. The problem of matching finishes often results in a permanent mismatch and the new work always appears different from the original building. The alternative is to change the existing finishes and materials to match the new work which can add significant extra expense which weren’t foreseen when the budget was prepared.
- Tying in a roof structure poses many challenges, the most obvious being to ensure that there are no leaks. But even getting the same materials of the same colour can be a problem.
- Existing floor levels may dictate the type of materials used on the new floor. Generally we don’t want small steps between different rooms in the house. So, if you’re chopping up the floor tiles in the bathroom and re-tiling it you’re often restricted to use a product of similar thickness, or thinner. Using a thicker tile or other flooring will mean the top surface is probably higher than the finished level in the adjoining room. It’s not recommended to reduce the top level of the existing concrete slab to accommodate a thicker tile because this is expensive and it will weaken the slab. Using a thinner tile will necessitate using more glue, or applying a layer of grout under the tile to ensure the top of the new tile is level with the adjoining room. In addition, changing the floor level will impact the doors. If floor levels increase doors may scrape on the floor so they’ll need to be cut shorter – not usually a major problem. But if the new floor level is lower, then the doors may have a large gap underneath which could be unsightly and allow

noise and light to enter from the adjoining room. You may have to install new doors of the correct length. Sometimes door frames and architraves end at the top of the finished floor. Installing a floor finish which is thinner than the existing floor will mean that the bottom of the frame is now raised above the new floor level. This is unsightly and is a place for dirt to be trapped and it could even be a hazard that cuts people's feet.





➢ Where floor finishes are carried through from one room to another, such as ceramic tiles or timber, it's difficult to find the same

matching materials and colours. In fact, even when the exact colour is found you'll frequently find that the existing material in the house has faded with time and use.

- Sometimes, simply moving a wall, or even a kitchen cupboard may seem simple, but often timber and tile floors have been laid around the existing wall or cupboard. Moving the wall or cupboard now exposes a bare piece of floor. Patching the timber or tile often results in colour differences (assuming the product is still available).

Case study: in our house we made renovations in the main bedroom. This involved moving a few walls slightly and the timber floor had to be patched in a couple of places. Firstly we had to find the exact same timber for the patches. Then the complete bedroom floor had to be sanded and sealed. But the timber floor continued from the bedroom out the door through the whole upper floor areas which weren't part of the renovations. The newly sanded and treated bedroom floor was going to have a different colour from the original floor which had aged in the sun and with use, so we had to sand and seal all the existing timber floor upstairs to achieve a uniform coloured floor – about one hundred square metres (a thousand square feet) because one square metre (ten square feet) of floor had to be patched!

Measure existing structures – they may not match drawings

Never assume that what's shown on drawings is exactly how the building was constructed. Sometimes renovations or changes were done to the structure which aren't show on the drawings. But anyway, often doors and windows aren't located in the exact location as shown on drawings. In particular waterpipes and electrical cables are often not in the precise locations indicated on the drawings.

What will be impacted by the renovation?

Case study 1: My parents enclosed their covered veranda converting it into a sunroom. Several months later we had a huge rainstorm and water flooded the new room. In fact the garden outside the new room became a large lake with water several inches deep. By converting the veranda to a room they'd cut off the natural drainage line and stormwater couldn't flow around the house so dammed up, eventually flooding the house. They had to install additional stormwater pipes to channel the water around the new room.

Case study 2: One person extended their balcony, adding a premade steel structure. But the contractor didn't take account of the downpipe coming from the gutters on the roof above, which could easily have been accommodated in the balcony if it was designed correctly. The downpipe had to be deviated around the balcony, which is unsightly, but worse still because the house is a terrace the deviated portion of the downpipe is now fixed to the neighbour's house which is illegal and certainly bad practice.

You should always consider what impact your renovations will have on other parts of the house. How it will impact the roof, drainage, light, flow (how people move through the various areas of the house), access and storage. See also the next section.

What are you losing – is it really worth it?

Home renovations sometimes involve converting a garage into another bedroom or games room. Enclosing a patio or balcony to make an additional living area, perhaps a bedroom. Even adding additional rooms and bathrooms involves losing some garden, as does installing a swimming pool. These projects all sound a good idea, but what is the impact of not having a garage or patio, or having less garden? Of course you could also decide to add more undercover parking, an additional patio, and if the garden is large you probably won't miss losing part of it – in fact there might be less garden work that needs doing, a bit less lawn to cut. But, it's important to understand what you're losing and if this will be a disadvantage. Always consider the alternatives, which might even include going upwards, but then going upwards requires a staircase which may also rob space downstairs.

Sometimes it's daylight that you're losing. Enclosing a patio inevitably makes the adjoining room darker. Even adding a roof over a patio makes the room darker. Always consider how your renovation will change the lightness of rooms.

Are you really adding value or wasting money?

Case study: I know somebody who purchased a house for $1.5 million. It's a two bedroom house, has a narrow dark staircase and two very small bathrooms that can't even fit a bathtub. The kitchen is small. Generally there isn't much to like about the house. However, he and his wife redid the bathrooms and kitchen, made other changes including redoing the floors, repainting and decking the internal

courtyard, probably spending in excess of $150,000. He got divorced, remarried and he and the new wife continued to live in the house. Now despite there being three bedroom houses with two big bathrooms across the road on sale for $1.2 million, and four bedroom, three bathroom houses a few doors away for $1.5 million they probably spent another $150,000 redoing the bathrooms and kitchen, increasing the size of the balcony, altering windows, adding cupboards, changing window coverings, etc. After all this expense they still have a house that has two bedrooms, two small bathrooms, a narrow dark staircase and which is probably worth less than $1.2 million! What a waste of money.

Now, as I've suggested there was an alternative to purchase a bigger house in the same neighbourhood. But, clever innovation and with a spend of $200,000 they could easily have added a third bedroom, which would have been a very generous master bedroom with a third bathroom (big enough for a proper bathtub and a shower) and a large balcony. Suddenly their $1.2 million house could have become a much nicer house to live in that would have been valued at over $1.4 million.

But really the problem with the house is it has 'bad bones'. It's poorly designed and has many features, including the staircase and bathrooms, which are very difficult to change. Spending any money on the house is really throwing good money after bad.

It's important to assess whether the changes to your house will be money worth spending by asking these questions:

- ➢ Are you adding value to the house?
- ➢ Is the house structurally sound? It's pointless upgrading and changing a house that's structurally unsound, maybe one whose foundations are sinking, that's infested by white ants or wood rot, or that's of poor quality.
- ➢ Is it possible to improve the bad features? As above, it's expensive, sometimes impossible, to change staircases and enlarge bathrooms.
- ➢ Are the changes you're proposing really going to make a difference to what you don't like about the house or are you skirting around the real issues?

- ➢ Would it be simpler and cheaper to find another house that you really like, or even, bash down the existing and start again from scratch?
- ➢ Once you've finished with the changes will the house still be a cohesive architectural style throughout, or is it going to look like a piecemeal hodgepodge of bits added on wherever changes could be made?
- ➢ Can you easily match the existing finishes? Costs can quickly escalate where the existing house has to be altered so that it matches the new portion.
- ➢ How will changes in the neighbourhood impact the value of your house. It's senseless spending lots of money renovating your house if a new highway or block of apartments is going to be constructed on your doorstep.

As the saying goes, "you can't make a silk purse out of a sow's ears", nor should you spend the energy and money in trying to turn a house with 'bad bones' into something that it can never be.

Renovating for profit

We regularly hear of people buying properties, renovating them, then selling them at a profit. They're called 'flippers'. It seems an easy way to make money. There are even television programs on this topic. Often it is easy, but there are perils along the way. It's important to:

- ➢ Ensure you fully understand all the costs. These costs include the transactional costs (which are agent costs, settlement fees and taxes), the holding costs (which is the cost of the money required to purchase and renovate the property for the time it takes to complete the design, obtain permits, do the renovation and finally sell the property, which could be twelve months or more, and if you've borrowed the money the interest bill on the loan can be considerable), all the renovation costs as previously discussed, and the taxes that you'll pay on the profits you make.
- ➢ Understand your potential buyers, which includes knowing what buyers are looking for (how many bedrooms, bathrooms and garages, size of property, architectural style, finishes, etc.), what buyers are prepared to pay (particularly in that area), what will appeal to buyers, and which neighbourhoods and suburbs are sort after.

- ➢ Prepare a realistic schedule so you know how long the project will take from the purchase to finally selling it again. Allow sufficient time to sell the house. You don't want loan payments falling due before you've sold the house.
- ➢ Carefully research all aspects of the project so that there aren't unexpected costs or delays.
- ➢ Put you own emotions aside. Think what buyers will look for and like.
- ➢ Don't only think of your profits. Remember there are no profits if potential buyers don't like what you're offering, so skimping on costs which delivers a substandard product will ultimately cost you money if you can't sell the house.
- ➢ Think through everything that will be needed to make the house sellable to the buyers that you're aiming for. Turning a house into a luxurious house requires work on a number of elements. Missing an element could bring the value of the whole house down. Consider the total package, including the garden, driveway, outdoor living areas and the boundary fence or wall.
- ➢ Understand the opposition – what other similar properties are available which could be competing for the same buyers you're aiming for.
- ➢ Prepare an accurate budget and cash flow with a realistic sale price.
- ➢ Not be overly ambitious, particularly with your first projects. Don't commit to projects that require major work or complicated renovations.
- ➢ Not purchase the first property you see. There will always be other houses available. Sure you may miss one opportunity, but you could also be avoiding a problem.

Of course, having said this, some houses can easily be transformed at minimal costs if they have the right bones and don't require large structural modifications. (See Chapter 6 for some simple ideas.) **Is there a master plan or are you working on whims?**

Before embarking on changes and renovations it pays to consider what you'd like to do and change in the house over the next few years. For instance, it might be pointless repainting and carpeting the interior of the house now if you plan to undertake major renovations in a couple of years'

time which could necessitate you repainting and carpeting the house again. Try and have a plan for the changes so that the bigger and messier renovations happen first, then the finishing touches (such as carpets and painting) happen later. But budget could also influence the order you tackle projects. Attempt completing the larger projects, in particular projects which have an unknown cost, sooner. For instance, if the electrical wiring requires replacing, or the roof needs to be repaired and the costs for these activities are difficult to quantify, then it may be better to tackle these projects earlier, while there're sufficient funds in your budget for the unknown costs, which in these cases could be considerable. This eliminates projects which require large contingencies. You don't want to be part way through a roof repair job to find that you've exhausted your funds and only part of the roof has been fixed. But of course you also don't want to be repairing roofs and redoing electrical wiring on parts of the building which could be torn down as part of planned renovations in the near future. Though, having said this, it's imperative to ensure the safety and integrity of the house and its occupants at all times, so critical repairs may have to be done sooner rather than later.

It's important not to just grab a paint brush and launch into your renovations without considering what's most important, your available budget, and the impacts of later projects on the work that'll be done now.

Equally important is to carefully consider if you're going to be able to achieve your vision, and then understand all the costs involved.

> *Case study: We were looking for a house and realised we probably weren't going to find exactly what we were looking for so looked at houses that could be renovated. We had a vision to have a house which was modern, bright and airy, with the correct orientation and a nice outdoor area. One house we looked at was difficult to extend because of the existing roof structure and we would have had to redo large sections of roof to add the extra space we wanted. Another property could be extended more easily, but there were a several issues. The house had numerous arched openings, doorways and windows which weren't going to fit the modern style we envisaged so these would have to be changed. The exterior of the house was an exposed cement brick which also wouldn't have matched the interiors we wanted to create, so the exterior walls would have had to be rendered or clad with another material at additional cost. But, the real deal breaker for us*

was the existing low ceilings. Low ceilings make rooms feel smaller and more closed in. They definitely don't fit a modern light filled house, nor would they fit the more luxurious feel we were aiming to achieve with the house, or appeal to the buyers we would be targeting if we sold the house. Lifting the ceilings wasn't going to be feasible.

Part of the master plan is to consider what the final architectural style of the house will be, and start planning all your projects to finally tie into this intended outcome. So, the tiles you select for your new bathroom may not necessarily tie into the existing finishes of the rest of the house right now, but they should tie into the final redecorated house when you've finished your projects. Of course, there needs to be a timeline to your master plan and it should be focussed on projects you'll probably be tackling over the next five years, and not projects that might never eventuate.

Summary

All of us do minor work around the house, whether it's some painting, minor maintenance, working in the garden, or getting into slightly bigger projects like adding a barbeque or installing a new patio.

But launching into a full renovation project requires more thought and planning. Regrettably some jump right in without knowing what they're in for, how long it'll take, how much it'll cost, or indeed, without knowing what the end result will be. Suddenly they're left with a house with bits knocked out here and there, and the family is living in a building site – a building site that could last for several years. Worse still, you could spend all this money and energy and find that what you've done is illegal, or that it hasn't added value to the house.

Before starting your renovations you should:

- ➢ Have a master plan of what you want done.
- ➢ Understand what permits are required.
- ➢ Know what restrictions there are on your property.
- ➢ Consider how the work will impact you and your family.
- ➢ Prepare a budget.
- ➢ Have a timeline for how long the work will take.
- ➢ Sequence the work so that urgent repairs are attended to first and that work that could be damaged by other trades is done last.
- ➢ Check that the existing plumbing and electrical is sufficient.
- ➢ Confirm the soundness of the existing remaining structures.

- ➢ Take care when carrying out structural modifications to the existing building not to weaken the structure where it could crack or even collapse.
- ➢ Locate and protect existing services so they aren’t damaged by the work.
- ➢ Identify hazardous materials and ensure these are removed and disposed of by experts.
- ➢ Understand how the new areas will tie into the existing building.
- ➢ Always physically measure the existing structures to confirm that the available drawings are an accurate representation of what’s there.
- ➢ Ensure that you aren’t wasting money, or that there aren’t other better options available.

Renovations will be messy, they will involve noise, dust, dirt and inconvenience and unexpected problems will be encountered. You need to be prepared to be flexible and always have money in reserve for the unknown. But breathing new life into an old house and living in a completed renovation that’s been well planned and executed will be rewarding and should provide years of joy and comfort to you and your family.

Chapter 4 – Designing Your House

Designing your new home can be exciting. However, it presents many challenges, not least to get it right, while threading your way through hundreds of options and choices, as well as numerous rules and regulations. Getting the design wrong could result in a house that:

- ➢ Doesn't comply with the required specifications, rules and bylaws. This could require expensive modifications, and in the worst case even demolition of the house.
- ➢ Isn't safe. Which could cause injury to you, your family, or visitors.
- ➢ Has leaks or damp that causes damage to the interior of the house and your possessions.
- ➢ You hate, one that's not suitable for you and your family's needs.
- ➢ Is costlier to build than alternatives. A house of poor value for money.
- ➢ Is costly to operate, with higher heating, gas and electrical bills than optimal designs have.
- ➢ Future buyers won't want, meaning you don't realise the money you've spent on the house.
- ➢ Is difficult or expensive (even impossible) to change later when your family's needs change.
- ➢ Has high future maintenance costs.
- ➢ You can't afford to build.
- ➢ Has no soul. A 'cookie cutter' house that looks the same as hundreds of others, that could be in any big city in the world.
- ➢ Is not a home.
- ➢ Is dark, gloomy and oppressive.

Fortunately there are many experts available to help design your house. Not only can they help you negotiate the regulations, they also have an understanding of materials, construction methods and good design principles. Yet, even using an expert you need to control the process to ensure that the house will have the features that you want. Don't be intimidated by their ideas, but always listen and consider their advice. They could help you avoid expensive mistakes. Nonetheless, at the end of the day you have to live in the house and you must be happy with it.

Some of the items to consider were discussed in the first chapter. In this chapter we'll consider other items to think about and possibly include. It's important always to think of the house, garden and the surrounds as one unit. It's pointless designing a house that doesn't allow you to enjoy the garden and swimming pool, or one where access is difficult.

The design process should start with your list of requirements, the number of rooms, type of rooms and their size. The main features you'll be looking for. It's important to understand your property – where the sun is (both in summer and winter), the location of trees and structures you want to keep, views, access, slope and the neighbouring properties. You also need to consider your lifestyle, and even your future lifestyle. Knowing the size of the block of land, the restrictions on the land and the external features required, it's possible to prepare some sketch plans. Sometimes you may have seen display homes which have layouts that would suit most of your family's needs. These sketches could go through a number of iterations to home in on the most suitable layout. Many people aren't good at visualising what the end product will look like just from a few drawings and sketches. So take elements, layouts and sizes from various display homes you've seen. How big is a room four metres (twelve foot) by three metres (nine foot)? Will all of your furniture fit? Well look at rooms that you think are a good size and measure them out. Know what size rooms you want before starting the design. Understand what layouts best suits your family's needs by looking at other homes. Know what architectural styles you like.

Knowing the ideal layout you can begin developing what the exterior of the house should look like. Possibly you have pictures of the style of house you want. The type of roof, kinds of windows and external features. The style might also depend on your planned garden as well as the surroundings and neighbours. Of course, all the way through this process consideration must be given to the building permissions, specifications and rules. Only once the internal layout and exterior features have been decided should you start preparing the full architectural plans and construction drawings.

At this stage it's important to review your budget. The house may have become too big or too complex for your budget.

It's important to get the design as close to what the end product will look like before detailed design begins. Sketches are often relatively quick,

easy and cheap to prepare, but detailed design costs more, so changes to the detail design will add to the design time and cost.

As the detail design architectural drawings are prepared you can get into the more finite details, such as, the position of lights and switches, detailing cupboards, doors, windows and plumbing fixtures. Finally, when you've nailed down all of these items you begin deciding on some of the finishes. Then the structural design of the foundations, floor slabs and roof can be done. Finally the detail of the remaining finishes can be completed, which would include the choice of tiles, plumbing fixtures, lights, paint colours and everything else.

Start firming up as many costs as possible, and once again review your budget.

Importantly review your original requirements. Does the design meet your requirements? Unfortunately, in the excitement of designing your new house it's easy to overlook or forget your original requirements.

It's vital to get the design right before construction starts. Changes made during construction will cost additional money and cause delays to the project.

The risks of designing the project yourself

How hard can it be to choose a paint colour? It seems easy to pick a colour, until you see the hundreds of colours available. There are literally fifty shades of white and fifty shades of grey! Then you select your colour from a piece of paper, purchase the paint, put it on the walls and it looks totally different from the colour you selected. That's because paint can look entirely different under different lighting conditions, and even by what it's paired with – like the colour of carpets, furniture and fittings. Then we haven't even mentioned the family arguments, with everyone picking a different shade of white. So employing an interior designer, or a colour specialist, to provide advice on paint colours can be money well spent, although it's obviously not a necessity. Fortunately many paint suppliers can provide this expert at no cost providing you use their products.

But some attempt more extensive renovations and construction work themselves without a proper design. This comes with some risk including:

- The work may not satisfy the building codes and specifications. This could mean that it has to be rectified, even demolished. Buildings that don't meet codes won't be able to be sold. It could even result in insurance policies being voided.

- ➢ The design could be structurally unsound, possibly not taking the type of ground conditions into account. This could lead to cracking. Second floor slabs could sag resulting in unsightly cracks, damages and uneven floor finishes.
- ➢ Poor designs can lead to poor layouts, which could include the inefficient use of space, poor ergonomics, doors not being able to open (there have been many instances when doors to toilets couldn't open because they clashed with the toilet, or there wasn't space for the person opening the door to step out of the way), doors clashing when they open (possibly blocking other doorways) and light switches being in the wrong place.
- ➢ The design could be unsafe, for example steps could be of the wrong size, handrails could be insufficient or weak, and structural elements could fail.
- ➢ Poorly designed buildings could result in problems such as leaking roofs, rising damp, leaky windows, poor lighting and blocked pipes.
- ➢ Poor designs can detract from the use and enjoyment of the house, even lessening the value of the house.
- ➢ Poor designs might result in extra construction costs which could be caused by the inefficient use of materials, more costly construction costs, redoing work because of design mistakes, and poor coordination of services and utilities in the house which results in clashes and items not fitting resulting in extra costs to make the necessary changes so everything fits.
- ➢ A lack of a unified architectural style and theme resulting in a patchwork of disjointed elements that don't relate to each other.
- ➢ Problems with designs and drawings could delay permit applications.

Sometimes the authorities and lenders will insist that the house, or elements of the house, are designed by a registered designer.

Selecting a designer – are they right for your project?

You should consider the following when selecting a designer:

- ➢ Does the work that they've done in the past look similar to the design you have in mind? Some architects are very good at cutting edge designs but may be less familiar or willing to consider more

traditional houses. Some designers are good at incorporating green principles.

➢ Talk to the designer. Do you think you can work with them?

➢ Check that they're willing to undertake your project.

➢ Confirm that they're familiar with the local rules and planning requirements.

➢ Ask for references, then ask their references the following:

- Was the designer willing to listen and incorporate their ideas?
- Did the design meet or exceed their expectations?
- Did the designer come up with innovative and new ideas?
- Did the designer push certain products or building methods? Why was that?
- Did the final price for their work differ substantially from the original price? If it did why?
- How willing was the designer to make changes to their design?
- Did the contractor find mistakes on the designer's construction drawings?
- What other services did the designer provide?

➢ Check if the designer has professional indemnity insurance. (Insurance to protect you should there be a problem with the design which costs you additional money to fix.)

➢ Ask the designer what technology they'll use to produce their design. Will there be a 3D model? Will you be able to view the house in Virtual Reality? These systems will enable you to better see what the finished house will look like, rather than you trying to visualise it from 2 dimensional drawings.

➢ Decide what services you want the designer to undertake, such as checking quality during construction, or even acting as the project manager.

➢ Check that the designer is willing to visit the site before starting design work so that they understand the property and the neighbourhood and any obstacles that could be encountered during construction as well as making use of the best features of the property.

➢ Ask how long it will take to complete the design.

➢ Check if the designer will obtain all permits and approvals from the authorities.

➢ Obtain a price from the designer. Check:

- Does the price include for a full set of construction drawings, including all details? How many copies of drawings will you get. You probably want at least three sets, possibly more if you're intending to get a number of contractors to price the project.
- Does the price include for all design work, including architectural, structural, electrical, plumbing and air-conditioning? If not will they coordinate all the other designers' work to ensure there aren't clashes and that the designs accommodate the requirements of all the designers?
- How many sketch plans and changes are included while you develop the final design?
- Will they be available to answer questions from the contractor at no extra cost?
- Will they help with the selection of the final finishes, including providing samples and advice on colour choices?
- Will they carry out inspections during construction to check quality?

➢ Ensure that the designer is appointed using a contract that clearly sets out the services they'll supply, the price for these services and a schedule of extra charges.

Surveying the property – what is there?

To design the house you need to know what's on the property. A land surveyor should be appointed to carry out a survey to plot:

➢ The existing ground levels on the property.

➢ The location and floor levels of existing structures that will be retained on the site. Don't accept that the positions shown on drawings is correct.

➢ The location and the depth of the town sewer system where the house sewer pipes will connect.

➢ The location of the water and electrical connections.

➢ The location and the level of the public road.

➢ The position of existing trees that you may want to keep.
➢ The location of the entrance to the property.
➢ The property boundary as it should be, as well as the current boundary fence if this isn't in the correct location.
➢ The position of any other items that could be of interest.

With this information the position of the house and the height of the internal floors can be decided.

Using standard plans (drawings/blueprints)

There're standard plans/drawing/blueprints that are available in books, or which can be bought. These can be a cheap alternative to employing an architect or engineer. However there are drawbacks which must be considered:

➢ The houses on these plans may not comply with the building codes and specifications in your location.
➢ The plans may not utilise materials or construction methods which are readily available in your area. Using the materials and construction methods on these plans may make the construction more expensive.
➢ The design may not be suitable for your block of land:

- It might not fit into the property.
- The foundations may be inadequate for the ground conditions on your property, or they could even be overdesigned for the ground conditions (which costs more money).
- The house may not be orientated correctly to suite where access is best for your front entrance and for the garages. Incorrect orientation may also impact energy utilisation, views, overlooking the neighbours, etc.

➢ The interior layout may not be exactly what you want.
➢ The house could look similar to others in the neighbourhood.
➢ The house may not include all the features you want, or it could include features that you weren't necessarily looking for which will add unnecessary construction costs.

Many builders offer standard homes (display homes). They have a set of various designs to choose from. Advantages of these are normally that:

- ➢ The plans have been developed for that city or general location and have already been approved, so there's less time required to get construction underway.
- ➢ There aren't additional design or architect's fees.
- ➢ The houses are often built more quickly because the contractor's workers have built similar houses before.
- ➢ The designs have been developed by understanding what the average person in your area is looking for. Do you consider your requirements the same as the average person?
- ➢ Most of these houses already have a basic cost, so you know before proceeding any further roughly what your costs will be. House styles and sizes can quickly be dismissed that don't fit your budget. Although it's important to note that these are normally the base prices, which will almost always increase due to you selecting other finishes and fixtures, the foundation requirements of your property, the location of your new house and other physical features of your property.
- ➢ These houses can be customised to a certain extent by selecting different fittings, fixtures and finishes at an additional cost. It's possible to make minor alterations to the interior of the house, but generally the external envelope will remain the same.

In some cases it's even possible to build prefabricated houses from parts that come in kit form and which are transported to site and quickly assembled. These are sometimes cheaper, and in most cases the construction time is much reduced. The trouble with these is that they're often difficult to change or alter later should you decide to enlarge it or make changes.

Of course using standard available plans offers you a starting point and gives you an idea of what you like and don't like. It may be easy and involve minimal costs to make minor changes to the plans, which could involve flipping the house over to form the mirror image, enlarging some rooms at the expense of others (even doing away with some rooms) changing the use of a room (even converting a garage to a bedroom) altering the positions of doors, or adding additional fixtures and cupboards.

Obviously it's important to not solely select a contractor because you like their display home or the house design they offer. You should still research the contractor to ensure that they're reliable, they have the required

resources and that they'll build your home with minimal fuss, while providing a quality product for a reasonable price. (Read Volume 1 for more on selecting your contractor.) **Green building (environmentally sustainable buildings)**

Green buildings are buildings which are energy efficient to run, are water efficient minimising the use of water, make use of sustainable construction materials, have a light footprint on the environment, create a healthier home and which minimise waste, both during construction and in the operation of the home.

Benefits of green buildings are:

- ➢ The building is often more pleasant to live in because it's for example cooler in summer and warmer in winter, or it's more inclusive of the natural surroundings.
- ➢ The building is cheaper to live in since it uses less energy, gas and water.
- ➢ They often incorporate materials which are less harmful to those living in the building.
- ➢ More people are choosing to buy, or live in buildings that incorporate environmentally sustainable products and that leave a smaller environmental footprint. Your house will be more saleable.

Making a building environmentally friendly and more sustainable doesn't have to cost lots of money. The cost of incorporating green solutions has come down markedly in the last few years as more people use these solutions. In fact, some of the suggestions below add no extra costs to construction. Many items are simply about making sensible informed decisions. Some green solutions include:

- ➢ Installing solar panels. These generate power on sunny days which can be used to supplement power from the utility provider. In some jurisdictions it's possible to sell excess power back to the utility provider. Coupling the solar panels to batteries means that power can be stored to be used at night when the panels aren't generating power.
- ➢ Installing solar water heating which reduces the energy demands of heating water.
- ➢ Utilising low energy lighting and electrical appliances. Electrical appliances have an energy and water consumption rating.

Selecting the right appliances will cut down on power and water bills.

- ➢ Installing automatic switching of lights. Often lights are left on in rooms which aren't being used. Fitting movement sensors to light switches means the lights in a room automatically turn off when there's no one present.
- ➢ Insulating walls, ceilings and under roof coverings helps keep hot air in the house in winter, and hot air out in the summer.
- ➢ Using airtight construction detailing, particularly at wall/ceiling and wall/floor junctions and around doors and windows.
- ➢ Planning the internal layout of the house so that windows are placed to maximise the winter sun and cooling breezes. Placing bathrooms and garages on the side of the house that receives the hottest summer sun and situating bedrooms where it will be cooler in summer and warmer in winter.
- ➢ Installing double glazing on windows to insulate the house.
- ➢ Orientating the house so that it allows the maximum amount of sun in winter to enter the house and less sun in summer. Some locations have cool breezes in summer and when the house is orientated correctly, with opening windows and vents placed to allow the breeze to blow through the house, it helps cool the house naturally.
- ➢ Using light coloured roofs and external walls to reflect solar radiation in hot areas, and using darker colours in cooler locations.
- ➢ Installing water flow restrictors in shower fittings and taps to reduce the water consumed.
- ➢ Harvesting (collecting) rainwater and storing it in tanks to be used for gardens, and even for some household use.
- ➢ Capturing grey water (water from showers, sinks and basins) to be used for gardens.
- ➢ Incorporating trees in the garden to shade the house in summer but which let the sun through in winter.
- ➢ Extending the roof beyond the outside walls to create eaves, which help shade the house, keeping the sun from shining directly through windows for longer. See later.
- ➢ Using plants in the garden which require less water.

- ➢ Not incorporating products which could give off harmful vapours.
- ➢ Designing the home so that it's easily adaptable to your family's changing needs and circumstances.
- ➢ Installing window treatments (curtains/blinds) that keep the summer heat out and keep the warm air inside in winter.
- ➢ Including thermal mass within the house, such as concrete, to store heat in the day, radiating it at night.

But you should also consider other ways to make your home more environmentally friendly, which include:

- ➢ Limiting the impact of the building on environmentally sensitive areas. For instance you shouldn't be draining wetlands, or constructing in sensitive dune areas. You should wherever possible keep the existing trees and vegetation. Sensible site selection and sensitive positioning of the house on the property can make a difference to the impact your house has on the natural surroundings.
- ➢ Using materials which have a low energy input and come from sustainable resources.
- ➢ Not incorporating materials which have caused undue damage to the environment, or impacted the health and wellbeing of those who have worked with the materials, or who have lived in the vicinity of where the materials were produced.
- ➢ Making use of recycled materials where possible.
- ➢ Using materials which can be easily recycled.
- ➢ Using materials that won't be harmful to people when the house reaches the end of its life and gets demolished.
- ➢ Considering the lifecycle of appliances. Install those which are reliable and can easily be repaired if necessary. Replacing appliances is expensive and it requires more resources from the environment.
- ➢ Allowing place in the garden to grow herbs and vegetables.
- ➢ Providing a place for a compost bin for kitchen waste and garden cuttings.

A green building starts with the materials and equipment incorporated in the building. Where did the products come from – was the environment harmed? How was the product made – were harmful products discharged into the air, rivers or the ocean? Were people adversely impacted by the

product’s harvesting and mining? Unfortunately many products which are touted as being green aren’t, and their continued use actually does more harm to the environment. We should all be sensitive to the environmental impact of our house. People are becoming more sensitive to environmental issues and governments are being forced to take a tougher stand on products and processes which aren’t sustainable or harm the environment.

Legislation often stipulates products and processes which must be incorporated into new houses. There are ratings which classify how green or environmentally friendly buildings are, and ratings that categorise the energy efficiency of a building. Often legislation specifies the minimum rating required.

Of course designing a product that fits with the environment it’s situated in can also be categorised as being environmentally friendly. Monstrous buildings that clash with their surroundings, or stick out like the proverbial sore thumb, are blights on the landscape.

Restrictions and rules

It’s imperative to understand the design standards that apply to buildings in your area. These could include national codes, state codes, local authority (city and town) codes and specific housing estate rules and codes.

National design codes usually specify:

- ➢ Materials that can be used, or which are approved.
- ➢ Requirements of materials to be fire resistant.
- ➢ Resistance to the spread of fires.
- ➢ Sound insulation of buildings.
- ➢ Structural design criteria, including designing for storms, snow, wind, earthquakes and floods as required.
- ➢ Types and thickness of glass.
- ➢ Roof design and roofing materials.
- ➢ Dimensions of stairs.
- ➢ The design of barriers to prevent falls off upper floors and stair edges.
- ➢ Smoke alarms.
- ➢ Firefighting equipment, where required.
- ➢ Lift installation.

- ➢ Keeping weather out of the building, including damp protection and waterproofing.
- ➢ Ventilation.
- ➢ Lighting.
- ➢ Thermal insulation.
- ➢ Barriers around swimming pools.
- ➢ Heating appliances, fireplaces, chimneys and flues.
- ➢ Gas installation.
- ➢ Plumbing installations.
- ➢ Electrical installations, including wiring, protection, fittings, materials and labelling.
- ➢ Energy efficiencies.
- ➢ Stormwater management.

Many of these codes are there for safety.

State codes generally have similar guidelines but may be more restrictive, or have sections pertaining particularly to their climate.

Possible local authority and estate restrictions are discussed in Chapter 3.

How many rooms and their functions

The number and type of rooms is usually dictated by your budget, the size (or intended size) of your family and extended family (which could include elderly parents who live with you) visitors that stayover (especially distant family), the age of your children (with teenagers possibly wanting a separate entertainment area where they won't bother the rest of the family), hobbies, your lifestyle and the amount of entertaining you do at home. But it's also wise to consider what future buyers may be looking for. You may be happy to have a two bedroom home and one garage and bathroom but this could be restrictive for future buyers. The majority of buyers are probably families, which as a minimum could be looking for three bedrooms, two bathrooms and two garages.

You might not be looking for a third bedroom, but it might be wise to have a study, office or workroom which has electrical points, doors, windows and cupboards in the right places so that a future buyer can just as easily use it as a third bedroom.

Size of rooms – not too big, not too small, but just right

It’s hard to assess the best size of rooms. The larger the rooms the more the house will cost. Larger rooms also require more energy to heat and cool. Overly large rooms can appear empty, almost soulless. However, small rooms often appear crowded and pokey. It’s best to visit different houses and look at individual rooms to decide the best size for you. The size of room is also influenced by the type of furniture you have, or intend to purchase. Big bulky furniture needs more space. Large families also require larger family areas. The size of family areas could also be dictated by the amount of entertaining and the number of friends that visit. Obviously if you regularly have large family gatherings you require sufficient seating for everyone.

To judge the scale of rooms you can draw and cut out some items of furniture to scale, then draw various size rooms to the same scale and try and fit the furniture into the rooms. But, remember to take account of the position of doors and windows. You usually don’t want furniture in front of windows, and doorways always take up space, both for the doors to open and also for people to walk through.

Where there’s a separate dining room ensure there’s sufficient space to fit a dining table suitable for the family as well as a number of guests. The room must be wide enough and long enough to fit the table, plus have people seated at the table, while still allowing space behind those that are seated for others to comfortably pass without knocking pictures off the wall. Allowing place for a side table is useful as it provides space to put dishes of food before and after serving.

Fortunately many designers now use software which can show the rooms in 3-dimensions, and with virtual reality systems it’s possible to ‘walk through’ the room and see it fully furnished. You can also purchase apps to view rooms in 3-D.

The size of room could also depend on the amount of storage you require for clothes, hobbies, kitchenware, etc.

The size of rooms should also take into account what future buyers might be looking for. So for instance, you may have very little need for a kitchen, or only a very small kitchen, yet the majority of future buyers will almost certainly be looking for a family kitchen if you’re building a three bedroom home.

When considering future buyers it’s pertinent to consider the price range that you may be aiming for. Generally buyers looking at more

expensive properties in more affluent areas would expect extra generously sized rooms, particularly for the master bedroom and bathroom. Clever use of space can make small rooms appear bigger.

Layout – what goes where and how the rooms fit together

Many houses are poorly laid out. They could even appear like a crazy patchwork quilt, with rooms fitted together with little thought on their connectedness, or the association between adjoining rooms.

The layout of your house depends to a large extent on your life-style.

Many owners prefer an open plan living, dining, family and kitchen area where these rooms are combined into one large common area. This allows for easy flow, it avoids doors and passageways which creates more living space, it lets more light into the spaces, and it allows for the family to interact more freely.

The disadvantages of an open plan system are that in summer the whole area has to be cooled and in winter the whole area has to be heated, even areas which aren't being used. This results in increased energy bills. It also makes it difficult to separate family areas from where guests are being entertained, and if you're someone that doesn't like your visitors to see a mess it means that the whole area has to be tidied and the rest of the family may have to be banished to their bedrooms before visitors arrive. It also means that when there's a noise in the kitchen, those watching television might not be able to hear their favourite program, while that program could be annoying to others who want to talk.

Some families design their houses so parents and children live in separate wings, or even levels, possibly providing separate entrances to these areas. This living arrangement can be particularly well suited for older children.

The layout of your house could also be influenced by:

- The shape and size of your property. Small properties may require the house to go upwards with two or more floors. Narrow properties, or irregular shaped properties could dictate the design of your home.
- The orientation of the property.
- The direction of views. In some cases you may elect to have the living areas on the second level to make the most of the views (sometimes called an upside-down layout) with the bedrooms downstairs.

- Access to your property, which dictates the location of garages and the front door.
- The topography of the property. Sloping properties may require the floor levels inside the house to be stepped.
- The size of your rooms.
- The architecture and style of the home.
- The location of structures on neighbouring properties which could impact privacy.
- Existing features on the property which you want to retain, such as trees.
- The location of sewer pipe (wastewater) connections which could impact the location of bathrooms, kitchens and laundries. Sewer pipes connect from the bathrooms, kitchen and laundry to the town system. These pipes have to flow at a constant slope to the town connection. If the height difference between the outlets of the house and the town system is small then the house waste pipes may have to exit at a point closer to the town connection to reduce the length of pipe, thus increasing the fall or slope of the pipe. See later.
- Noise sources. You may want to place bedrooms away from external noise sources such as busy roads.
- The flow. When visitors enter your house what do they see and where do their eyes go? How do the different parts of the house connect together?
- Privacy. You probably don't want visitors walking past the kitchen to get to entertainment areas.
- Functionality is important, so kitchens should be close to eating areas. Bathrooms near bedrooms so occupants don't have to walk past visitors to go from their bedrooms to the bathroom. Living areas should be next to the outdoor living areas.
- You want as little wasted space for passages (corridors) as possible. Anyway long passages can be dark, uninviting and make the house seem like a hotel.
- The relationship of the different sizes of rooms. Ultimately they all have to mesh together without wasted space between them, or awkward nooks and hidden corners in rooms.

- ➢ What rooms you want in the front of the house and what you want at the back of the house.
- ➢ On multistorey houses, the layout of upstairs areas is influenced to a certain extent by the layout below, as well as the location of the stairs.

Take ideas from houses you lived in. Know what worked well and what arrangements didn't work for you and your family. Visit homes for sale and display houses and consider which layouts work for you. Look at various layouts. You'll soon develop a feel for where you want the front door and how the house will flow from there. Where would you like the bedrooms to be relative to the living areas, and do you want your bedroom separated from the other bedrooms?

In your head imagine walking through the house following your normal daily routine.

- ➢ Are things where you expect them to be?
- ➢ Imagine greeting visitors at the front door. What will they see first? Walk them through to the living room. What do they walk past? What do they see when they get to the living room?
- ➢ Now imagine the children are at home. Where will they be and what will they be doing? Where will they do their schoolwork? Where will they play?
- ➢ You want to watch the television. Will it be alone or with the family? Will you be able to see the television during the day or will there be reflections from the windows on the screen?
- ➢ Where will you go for some peace and quiet? Where will you go to do your taxes and other paperwork.
- ➢ Imagine getting up in the morning. Will the bathroom be free? Who else will be up at the same time? (Adding an extra toilet room can ease congestion in the mornings and make for a more congenial start to the day.) Will people be getting in each other's way?
- ➢ Where will you enjoy family meals? Is this convenient to the kitchen?
- ➢ Now imagine arriving home with a load of grocery shopping. What's the route to get the shopping inside and where will you put it?
- ➢ What if it's raining and a visitor arrives at the front door? Will they get wet while they're waiting for you to open the door? Where will

they put their wet umbrella and coat?

- ➢ What if it’s raining and the children can’t go outside?
- ➢ What do you like doing on hot summers days?
- ➢ Where will you be in winter?
- ➢ If the children are playing loud music in their bedrooms how will it impact the rest of the house? If the television is on loud can you escape it?
- ➢ What view will you see from your bedroom when you get up in the morning? What view do you see from the kitchen? What will you see from your living room? Will the views be different in summer and winter?
- ➢ What will the neighbours see?
- ➢ Imagine living in your house on workdays, holidays and at night.
- ➢ Where will the sun be in the morning and where will it be in the afternoon? Will daylight reach all the rooms, or will you need the lights on inside during the day?
- ➢ What defines the different spaces in your home? What connects them?
- ➢ How does the outside tie with the inside?
- ➢ What will the house look like from the outside?
- ➢ When you live in the house how will you respond to it and how will it respond to you?
- ➢ What impression will visitors have of your house?
- ➢ Will it be a home?
- ➢ Is it a comfortable place that you and your family will enjoy living in?

Houses with a rectangular layout are often cheaper to construct and the roof is simpler to design and build. But rectangular might not suit all your requirements and the outside could be boring. For more complex external shapes consider what the roof will look like and how the roof will accommodate the external walls of the house.

Entrances – the eye to your home and an essential element

The front entrance is the first thing that visitors see when they enter your house. Some entrances are a grand statement while others appear narrow and uninviting. What will the entrance say about your house?

Entrances usually include a porch, where people ring the doorbell and wait for the door to open. It's often where you stand while you search for keys before opening the front door. Will you and your visitors get wet when it's raining? Will the front door be exposed to full sun or rain? Where will you take off coats and fold umbrellas? Where will the doorbell go, maybe even an intercom and camera? Where will the light be so that it illuminates the space, including the door lock?

The front door opens, what do visitors see first – the kitchen, a toilet, or an inviting space? Where will coats, umbrellas and keys be put? Will the style of the entrance hall or lobby be an impression of what's to come? Will your visitors feel welcome? Consider where doors and passageways will lead off to. Will it be light and bright, or narrow and gloomy?

Entrance porches and entrance lobbies or halls may seem an expensive waste of space and are often overlooked, or even cut-out completely. Yet a couple of square metres for a porch, even if it's only an overhanging roof, can add to the presence of your house and be a practical addition. A few square metres set aside for an entrance hall can add value to your house, while adding to the amenity and convenience. Consider lifting the ceiling and adding windows. A feature light can often set the tone for the rest of the house, but always ensure that the light fits the space and doesn't dominate it.

Separate entrances

Sometimes having a separate entrance to rooms used as a home office, or possibly a flatlet for elderly parents or visitors can be useful.

Stairs – statement or hazard

Some homes have more than one level. Depending on the height difference the different levels are connected by steps. There could be only one or two steps for small level differences, or they could be a flight of stairs going from a ground floor to a second, and even a third floor. Some homes have grand staircases which create a statement and add to the feeling of opulence of the home. Stairs take up space and so are often squeezed into awkward spaces. Regularly steps are poorly designed and they are hazardous, or at best inconvenient. Every year countless people are seriously injured falling down (and even up) stairs. None of us would like to see a family member injured, but equally important is to ensure the safety of visitors. Poorly designed stairs can make the house less saleable.

Stairs should be designed and placed so that they're an attractive feature, while being practical and safe.

Flights of stairs connecting one floor to another could be in a straight line, they could turn through a right angle part way up, they could turn back on themselves, they can gently curve, or they may form a tight spiral. Ladders are often used to access storage attics.

Steps can be solid and in some cases it's possible to fit small rooms or toilets under the staircases which means that space isn't wasted. Alternatively the staircases can be 'floating' over the room.

When designing staircases or flights of steps it's important to consider the following:

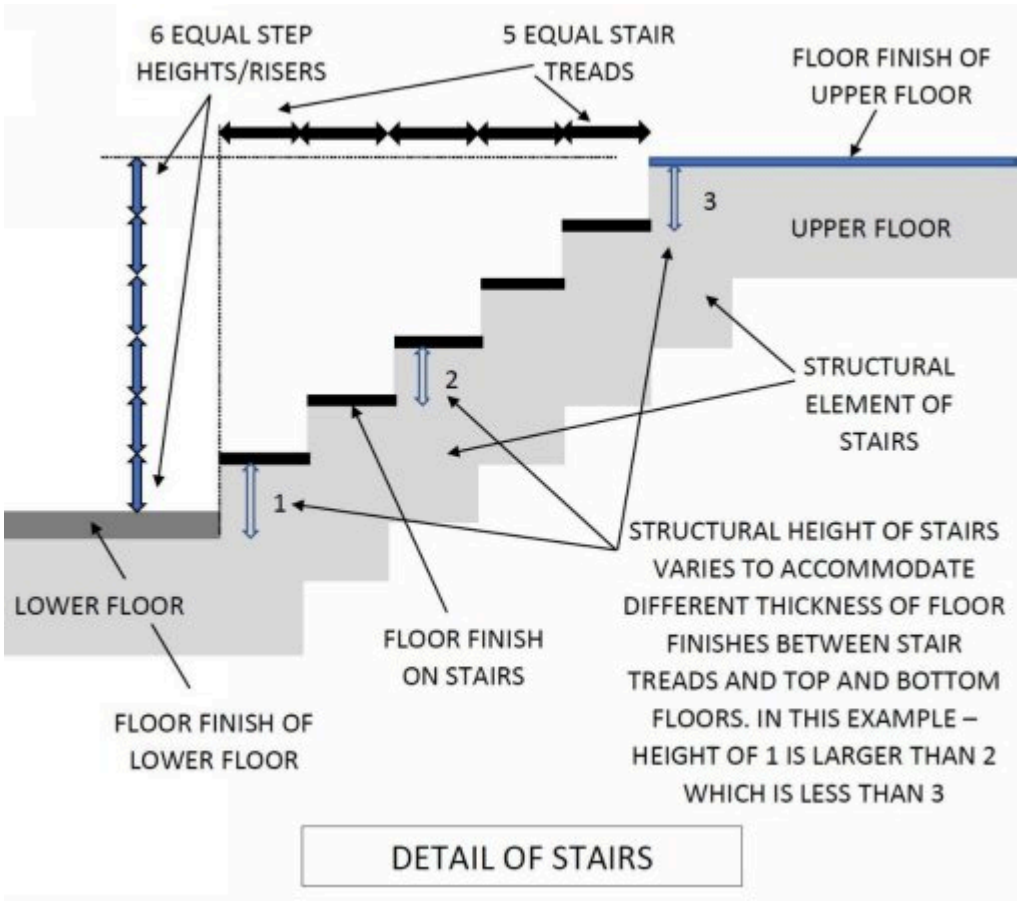
- ➢ The stairs must be well lit. Dark areas and shadows are dangerous and could lead to falls.
- ➢ The difference in elevation from the top floor to the lower floor.
- ➢ The regulations – which usually specify minimum widths, the height and depth of each step and the handrail requirements.
- ➢ Ideal dimensions are:

- The width of the staircase should not be less than 900 millimetres (3 feet) (preferably wider – 1200 to 1500 millimetres (4 to 5 feet)).
- The height of each step (riser) should be between 115millimetres and 190millimetres (4.5 to 7.5 inches).
- The depth of each stair tread (going) should be between 240mm and 350mm (9.5 to 14 inches).

- ➢ The layout of the house. What's the desired starting point for the stairs and the desired end point. You probably don't want stairs ending inside a bedroom!
- ➢ Stair treads must be non-slip.
- ➢ Preferably the edge of the stair should be visibly different, so the demarcation between different stairs is clearly visible.
- ➢ There shouldn't be any trip hazards at the top or bottom of the steps, so the finish on the stairs should merge seamlessly into the surrounding floor levels.
- ➢ The size of the risers (height of each step) must be a constant height. The depth of each tread or step must be a constant size. To

obtain the required number of steps divide the difference in elevation from the top to the lower floor (measuring from finished floor levels including the thickness of tiles, carpets, timber, etc) by a number between 115mm and 190 mm (the desired range of step heights). Obviously the number of steps must be a whole number. Using the closest whole number of steps it's then possible to work out the required height of each stair which must be in the range above.

- ➢ They should have a handrail on at least one side.
- ➢ There should be a balustrade or wall to prevent anyone (especially small children) falling off the side of the stairs.
- ➢ Doors opening onto the stairs, or at the top of the stairs, shouldn't open in such a way that the door could hit a person walking up or down the stairs, thus causing them to fall.
- ➢ It's important when designing and constructing the stairs to know what the floor finish will be on the steps as well as on the lower and upper floors. If the stairs haven't been designed to take account of these finished levels you could find that the bottom and top stair heights are different to the rest of the step heights.



- ➢ Your budget. Curved staircases are usually more expensive, as are some floor finishes, materials and balustrades.
- ➢ The finish to the stairs should be reasonably tough and hard wearing as stairs usually take more traffic than the rest of the floors and you also don’t want the edges of the stairs to become chipped and bashed.

Stairs can be constructed from concrete, timber, steel, glass and aluminium. The stair treads can be covered with carpets, tiles or timber, or the treads can be glass or punched metal.

Sometimes stairs are useful to allow external light to penetrate to a lower level. This could be from a skylight over the stairs, or from windows on the stairs.

Landings (which are flat areas part way up the flight of stairs) allow space for stairs to turn sharp corners and also provide a rest break for people walking up the stairs.

It’s important to remember that stairs are often the only way to move furniture up and down to other levels. Stairs that are narrow, steep, or that

have sharp corners can make moving furniture difficult.

Staircases should be designed by an engineer when they are only supported at the bottom and the top.

In general, stairs shouldn't be located in the middle of the room where they not only disrupt the layout of the room, but they could create an unexpected trip hazard.

Stairs are a problem for the elderly and those with mobility problems. Consideration may have to be given to constructing your home on one level. Where it's necessary to have one or two steps going to a lower level consider replacing these with a ramp, although a ramp requires more space. When budgets and space allow, it's possible to include a lift or elevator for moving from the ground level to upper floors. Note that even with a lift, stairs are still required as an alternate access in an emergency. Alternatively consider designing your staircase so that it's wide enough and with suitable balustrades so that a chair lift can be added now or in the future.

Bedrooms – ensuring they are restful places

You'll probably spend more time in your bedroom than in any other room, so get the design right. Too often bedrooms end up being small and it's difficult to open cupboards and drawers without banging into things or getting in the way of your partner.

The size of the room will depend on the size of the bed that you and future occupants of the house have. Will it be a single bed, double, queen, king bed or two separate beds? Allow place for bedside tables. Decide if you want built in cupboards or freestanding wardrobes. Allow sufficient space for your and your partner's clothes. Consider where empty suitcases can be stored if required. You probably should allow for a dressing table. Building this in might use space more efficiently. Allowing space for at least one chair can add some luxury when the bedroom is furnished.

Situate your bedroom where it will be least impacted by outside noise. Consider double-glazing the windows – this could be a good investment for restful sleep. Even consider adding additional insulation to the walls and ceiling if you think that external noise could be a problem.

> *Case study: The main (master) bedroom of one house was situated at the back overlooking a laneway with other houses in close proximity. Fortunately the closest neighbours were fairly quiet. The problem was that because the laneway was narrow and surrounded by buildings the slightest noise echoed and was amplified. Even people*

speaking normally in the lane sounded loud in the bedroom. Although the other side of the house was on a busier road there was actually less noise here because the sound wasn't trapped by the surrounding buildings. We eventually had to install double glazing in the windows and double insulate the ceiling.

Children's bedrooms should allow sufficient storage space for clothes, toys, hobbies, sports and school items. It's a good idea to allow space for a desk, or build a desk in.

Position doors considering the line of sight of people in the house. You don't want to look down passageways straight into the bedroom, or have visitors in the entrance hall gawping into bedrooms.

Locate windows to take into account the location and height of beds and the position of cupboards and dressing tables. It will help cool the room if you can have windows on two or more walls so there's cross ventilation.

Ensure there're sufficient power outlets on either side of the bed and also allow for the installation of a television set, even if it's not necessary for your needs.

You want to be cool at night, so consider installing a ceiling fan and maybe even an air-conditioner – see later.

Cooking kitchens – what to consider when designing your kitchen

A great cook's kitchen can often sell a house. But not everyone needs a cook's kitchen. In fact, these days many families dine out or order in. So I've seen houses with small kitchens, but this can limit future buyers, excluding some.

Kitchens are expensive, and changing the layout and fixtures later will be costly so carefully consider the design layout. Kitchen suppliers can create 3-D graphical designs of your kitchen. A good kitchen is one that's functional while also being aesthetically pleasing. It should be practical, easy to clean with a great use of space. It's a place to cook, often a place to eat, and of course it can be a place to impress friends.

Considerations for kitchens include:

- That there's sufficient space for appliances, which include fridges, freezes and dishwashers. Consider what size fridge and freezer a family will require, not necessarily only what you want.
- That there's sufficient counter space for working on.

➢ There’s sufficient (rather an excess) of electrical outlet points so appliances can be connected. These should be placed where they’ll be required and above counter tops.

➢ There’s sufficient cupboard or storage space for crockery, pots and pans, utensils and groceries. Considerations include:

- You could have a walk-in pantry for groceries.
- Allow a mix of drawers and cupboards of various heights and sizes.
- Place for brooms and vacuum cleaners.
- Cupboards placed above counters are great, but ensure that they aren’t too low, and that they step back slightly from the countertop below so that you don’t accidently hit your head on them while trying to work on the counter below.
- Cupboard doors help keep dust off items and are useful to hide untidy spaces.
- Taking cupboards to the ceiling creates extra storage, but cupboards above head height are only useful for items that are seldom used and not for general items which are used every week. You don’t want to be using a ladder every time you need your everyday things.

➢ That there’s sufficient space to move around and between counters, even if the oven or a drawer is open. The areas most used are the sink, stove and fridge, so these three items should be within easy reach of each other, but not right on top of each other, and they should where possible form a triangle with them all being within two to three metres (six feet to nine feet) of each other.

➢ That wash-up sinks are big enough for large pots and plates. Personally I find small sinks irritating where you can hardly wash anything. Double sinks for washing and rinsing are useful. There should be sufficient space for stacking dirty and drying items on either side of the sink – sure you may have a dishwasher, but guaranteed you’ll always wash something in the sink. Areas around the sink will get wet, so make certain that the counters can withstand the wet and always silicone seal between the sink and the counter so that water doesn’t leak down into the cupboards

below. Installing tiled or glass splashbacks behind sinks placed against walls is good practice, since they're decorative, protect the wall from moisture and are easily cleaned.

- ➢ Kitchens can be messy areas, so consider what you might want to screen off from visitors. Open plan living areas and kitchens are great for family interaction and communication but you might not want visitors to see your piled up dirty dishes. Screening can be achieved by raising the front of counters above the sink height, or placing some items around the corner, out of the immediate line of sight.
- ➢ Do you want to include an eating area in the kitchen in the form of a counter, or even a table and chairs?
- ➢ Lighting is important, especially over work counters. Carefully consider the placement and type of lights. Perhaps even have lights on different circuits so they don't all need to be on at the same time if not required.
- ➢ Counter tops should be robust, not easily marked but easy to clean. Marble isn't a good material for kitchen tops because it can get stained. The countertop can add immensely to the feel of the kitchen and often it's worth spending a little more money for granite or stone tops.
- ➢ Areas around cooktops will get splattered with fat and oil so they should be easily cleanable. Install an efficient extractor by the cooktop to suck away cooking odours, oils, greases and smoke. Don't have cupboards right next to the cooktop where they may be damaged by heat.
- ➢ Floor finishes should be hard wearing, nonslip and easily cleanable.
- ➢ Good natural light, especially the morning easterly sun can make kitchens welcoming and cheerful. Think carefully about the size and position of windows. Windows take away cupboard or storage space, but you also don't want dark gloomy corners in the kitchen.
- ➢ Try and choose light bright colours for counters and cupboards, maybe adding in splashes of trim colours. Remember, not everyone wants green, bright red or dark blue cupboards. Repainting a wall is easy, but changing the colour of kitchen cupboards can be costly, which future buyers could factor into the price they're willing to pay.

- The overall style of the kitchen should match the rest of the house. A cottage kitchen will look out of place in a modern house!
- When choosing fitted appliances such as ovens, cooktops and cooking extractors, ensure you choose ones that are reliable and can be serviced and repaired. Preferably appliances that are a standard size. When appliances have to be replaced because they're broken it's expensive if you have to call in a cabinetry contractor to redo cupboards and counters because the new appliance doesn't fit.
- Having appliances such as fridges and dishwashers fitted, with matching finishes to the kitchen cupboards, seems a good idea and it can look sleek, but consider what happens when the appliance has to be replaced, or even repaired. New owners may in fact not like the fridge you've installed and they'll incur additional costs to fit their new fridge.
- You can purchase standard off the shelf kitchens, but then you should carefully plan the layout and size of your kitchen so that these standard units can easily fit without wasted space and without modifications. These calculations should allow for the completed thickness of walls, including plaster and render.
- Allow place for refuse bins – usually more than one bin to allow for general waste plus recyclables. This area and the bins must be easily cleanable so be vigilant when building bins permanently into cabinetry.
- Carefully consider the handles and latches on cupboards. Nice handles can add to the style of the kitchen with little extra cost. Check that they aren't going to catch you, or hook onto your clothes as you walk past. They must be easily grabbed to open so that even with wet or greasy fingers you can open them.
- Decide where kettles could be positioned since these give off steam which could damage cupboards.
- Is installing a double oven and double cooktop essential? It may be trendy, but it's expensive and uses space which might be more useful for storage.
- Ensure that the kitchen complies with the safety regulations. So for instance, electrical switches and sockets must be located a specified distance from water sources and sinks so they won't get

wet. Kitchen exhaust fans should discharge outside and be easily cleanable to prevent grease build-up. Cooktops shouldn't be near curtains that could catch fire, or by open windows where a breeze could blow out a gas flame.

- ➢ Sinks and counter tops should be the correct height. Counters that are too low result in excessive bending which is tiring on your back. Low counter tops may also restrict the height of dishwashers and other appliances fitted under the counter. But counters and sinks that are too high can also be difficult to work with. We're all different heights, so what suits one person might not be suitable for others. If you're short you'll want the counter lower, while taller people want counter tops higher. The usual height is about 900 millimetres (35 inches) but heights could range from 850 to 1050 millimetres (34 to 41 inches). Check that your dishwasher will fit under the counter and remember that this dimension is usually to the top of the counter from the finished floor level (be careful to make this clear). The space under the counter is then reduced by the thickness of the actual counter and any supports for the counter. (Note: sometimes kitchen cupboards are placed on the concrete floor slab and then tiles are laid on the concrete around the outside of the cupboards. The thickness of the tiles and glue then reduces the useable height under the counter.)
- ➢ Ensure there're water and wastewater connections provided close to where appliances such as dishwashers will be installed. Waste pipe outlets for dishwashers usually must be at a set height. Check that electrical sockets are conveniently positioned for fridges and dishwashers where they can be easily accessed.
- ➢ Don't get carried away with fancy gadgets and appliances that you'll almost never use, but which will take up space and cost money. Always be practical and know what works for you, and of course what works for your partner.
- ➢ Always leave sufficient space around in-built appliances so that air can get around them to prevent overheating and so that they can be manoeuvred out when there's a problem.
- ➢ Consider installing a water filter system for drinking water.
- ➢ Find a convenient location for a small fire extinguisher.
- ➢ Employing a kitchen designer can help avoid expensive mistakes.

Bathroom essentials

Bathrooms are expensive to build and to change should you decide to modify them later. A nice bathroom can be a valuable addition to your home. Frequently bathrooms are poorly designed, don't take account of your family's needs (or future needs) and are squeezed into the available space. In designing a bathroom it's important to consider what should be included, the location and size of windows and the location of doors. Bathroom suppliers can often create 3-D drawings for you.

The design of your bathroom should consider the following:

➢ Ventilation in the bathroom is essential to get rid of odours and to prevent moisture build-up. Bathrooms that are always wet and steamy will result in mould growing on walls and floors, which is unsightly and unhealthy and difficult to clean. In addition, towels won't dry easily and items in the bathroom cupboards could be spoiled by the continuous moisture. Ventilation could include (preferably both options):

- Windows that open. Opening windows should take privacy into account.
- Fans which could be connected to the light switch so they come on when the light is turned on, or fans which have a separate control switch. The extractor fan could be installed in the ceiling where it should be connected by a duct to the outside of the roof. Fans that just blow the air into the roof space will result in moist air accumulating in the roof space which could cause mould and rot to develop in the roof. Alternatively fans can be in the external walls, or even placed within the glass of the window.

➢ Heating is useful for cold climates. Nobody wants to step out of a nice hot shower or bath into an icy cold bathroom to get dressed. The type of heating may be restricted by local building regulations but it could include underfloor heating, radiators, heaters, heating lights, and heated towel rails. It's important to check that the items installed are suitable for wet areas.

➢ Good lighting is vital in a bathroom. Lights should be both functional, bright (without appearing like a hospital operating room) decorative, and of course lights must be fit to be installed in

wet areas. Lighting should include general lighting which doesn't leave dark corners, particularly in showers, and lights over mirrors and wash basins. Poor lighting makes it frustrating to shave and apply makeup. Individual controls can be used for different lights.

- ➢ Functionality. There must be sufficient space to step out of baths and showers to dry oneself. Doors must be able to be opened without being restricted by toilets, bathtubs and cabinets, while also leaving space for the person opening the door. Preferably there should be sufficient space so that one person can use the washbasin and still allow another person to pass.
- ➢ Privacy. Privacy includes what can be seen and heard from outside the house as well as what can be seen by people in the house walking past the open door. Including a separate toilet cubicle in the bathroom is often a good idea, but it does require more space. However, it could mean that two people can use the bathroom simultaneously without getting in each other's way.
- ➢ Don't make the toilet the first thing you see when you open the door.
- ➢ The size of the bathroom depends on what you want in the bathroom. Do you want a shower and a bathtub? Do you want a double basin? Do you want to separate the toilet from the rest of the bathroom? The temptation is often to reduce the area of the shower, but knocking against the shower sides and soap dispenses while you're showering is irritating, even painful. Try and keep showers at least 800mm by 800mm square (31 by 31 inches) (preferably larger – 1000 to 1200 millimetres by 1000 millimetres (39 to 47 inches)) although if space is limited you can consider splaying or rounding one of the corners.
- ➢ Including a double vanity, or a 'his and her' basin (sink) adds convenience, reduces arguments over toiletry locations and mess and gives an added wow or luxurious factor. Of course you need a slightly bigger bathroom.
- ➢ The standard height for the top of a basin (washbowl) is about 850 to 900 millimetres (33 to 36 inches). Some basins (depending on what you choose) sit on top of the vanity (counter) which means that the top of the vanity should be lower to accommodate the raised basin bowl. Other basins only have their lips above the

counter, while others fit to the underside of the counter (but in both these cases the bulk of the basin sits below the vanity top so the top of the vanity can be at the 850 to 900millimetre height). Of course taller people may prefer basins set slightly higher.

➢ Counter tops around wash basins should be robust enough to withstand water splashes and spillage, and they can add a luxury feel to the bathroom if they're of stone or natural materials.

➢ There should be adequate space in front of the toilet and to the sides to allow easy access. Also, consider where the toilet paper holder (dispenser) will be fixed where it won't get wet from the shower or washbasin.

➢ Bathtubs that are too short are useless and irritating – who wants to bath with their knees bent nearly around their ears? Try out the bathtub in showrooms by getting into it. Ensure that your bathroom is big enough to fit the bath that's the right length.

➢ Avoid bath showers, they can be dangerous. Sure it's useful to have a handheld shower by the bath for washing hair while you are bathing, but not for actual showering.

➢ A built in seat in the shower can be a useful feature for people to use when they are shaving, or for someone who's infirm – of course this isn't suitable for small showers.

➢ Avoid shower curtains. They look cheap and are irritating, sticking to you when you shower. Glass (Perspex) walls and doors on a shower are more expensive but they'll add immensely to the look of the shower. Ensure the fittings are sturdy. Choosing a cheap sliding door in a spindly frame could result in the door frequently becoming jammed or coming off its tracks.

➢ Storage space is essential in any bathroom and can take the form of:

- Under basin storage. An integrated vanity with shelves or cupboard under, which serves a dual purpose of hiding water and wastewater pipes. Remember though that the underside of the basin and the plumbing pipes will reduce the amount of storage available.
- Mirror cabinets above the basin. These could be recessed into the wall to increase space or to reduce the amount they protrude

beyond the wall. In fact if they're recessed they might not have to protrude from the wall.

- Shelving above basins for toiletries.
- Other cupboards if space is available.
- Shelves in showers and above baths to store soaps and shampoo.

➢ Dirty clothes are often stored in the bathroom before being washed. Place could be allowed for a laundry basket or bin. For houses with a second or third storey, incorporating a laundry chute into the layout so that dirty washing can go straight to the laundry below is a neat feature. Obviously this chute needs to be positioned vertically above the area below where the dirty washing will be stored, which is usually in the laundry.

➢ There're a wide range of bathroom fittings and fixtures which can vary hugely in price. Choose tap handles which are easy for old people to operate, even when your hand is covered in soap. Having a combination shower with a fixed shower head which also has a flexible hose attachment is useful. Bath and basin tap spouts must be practical and long enough so that water goes into the bath and basin without splashing out.

➢ Position taps in showers and baths correctly. The shower controls should be accessible from both inside and outside the shower and should be able to be operated without you becoming wet. Bath controls should be easily accessible to a person seated in the bathtub without having to turn around and the controls must be easily reached from the outside of the bath.

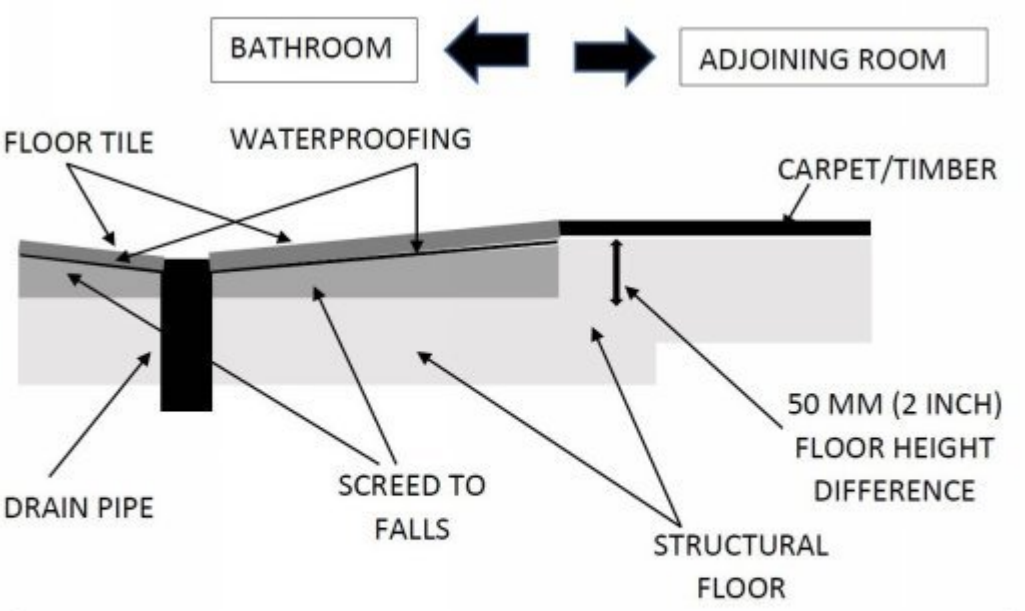
➢ Pipe entry and exit points are dictated by the type of bathroom fittings and tapware selected and also by what's structurally possible. Wastewater pipes from baths, showers and toilets have to flow down and out the building. Generally they have to be installed in the floor, or below the floor, unless they can run down inside an enclosed duct or wall. To accommodate waste pipes there should be adequate space in the ceiling voids in the floor below upper level bathrooms, otherwise baths, basins and toilets have to be positioned on the outside walls, or internal walls must have ducts (cavities) for the pipes, or the shower floors and bathtubs

have to be raised above the floor to create space for waste pipes, which isn't ideal.

- ➢ Regulations and safety are important, so floors should be non-slip and electrical fittings must be compliant for wet areas. Some regulations require that the bathroom floor has a drain for cleaning and in case of flooding, so then the bathroom floor should grade (slope) towards the drain. Generally all bathtubs and wash basins should have an overflow so that if the outlet is closed and a tap is open then water can still escape the basin or bathtub when it reaches a certain level so it doesn't flood the bathroom. (Note, it's pertinent to ensure that these overflows are actually connected to the wastewater pipes when the basin and bathtub are installed, as some plumbers neglect to complete the connection.)
- ➢ Sound waterproofing is essential in bathrooms. This includes waterproofing shower walls where they can be splashed, under showers so that water doesn't flow into neighbouring rooms or to rooms situated below the shower, and also waterproofing around bathtubs and under bathroom floors for bathrooms on upper levels.
- ➢ Bathroom colours. Not everyone wants a bathroom that has pink, green, or other colour fixtures and tiles. Fashions change and what's the 'in' colour now could be completely different next year. Even what we like changes. Changing tiles and bathroom fixtures (such as toilets, bathtubs and basins) is expensive and time consuming, so try to keep these colours neutral. In fact toilets, basins and bathtubs should be white – keep it simple. You can add accent colours with trims and paint, and even with the towels and the bathroom mats you use. Light colours make the bathroom appear brighter.
- ➢ Wall finishes. Paint on walls and ceilings should be a product that can withstand damp conditions and which will resist mould growth. Tiling bathroom walls to the ceiling provides a more luxurious finish and is usually easier to maintain, however tiles are expensive. As a minimum, walls in showers are tiled to at least 1.8 metre (nearly six foot) and the area around basins and baths are tiled to about 400 to 600 millimetres (eighteen to twenty-four inches) above the basin and bathtub to create a splashback. There

are other products which can be used in place of tiles, even Perspex and glass.

- ➢ Choose wall and floor finishes that can easily be cleaned. Tiles which have a rough texture or finish could allow mould to develop and be difficult to clean. Carefully consider tile layouts and colours.
- ➢ Consider how pipes can be accessed if there's a blockage or a problem. Sometimes installing suitable access panels could eliminate problems in the future.
- ➢ Accessibility. For those who are older or disabled you should consider fitting grab rails to the wall above bathtubs, in showers and next to toilets, ensuring that doors are wide enough for wheelchairs, not having steps into showers, building the bath so it isn't raised too high above the floor, and installing taps that can easily be gripped and turned.
- ➢ Floor transition from other rooms to the bathroom. Bathroom floors often have to slope towards floor drains. In addition bathrooms on upper floors should have a suitable waterproofing membrane between the floor finish (usually floor tiles) and the structural floor. Between the provision of the waterproofing and the gradient of the floor it could mean that the bathroom floor could be fifty millimetres (two inches) thicker and higher than the floor of the adjoining room. Obviously we don't want to have a step up into the bathroom. Therefore, to accommodate this requirement it's good practice to design the top surface of the structural floor element for the bathroom of the upper storey to be fifty to seventy-five millimetres (two to three inches) lower than the adjoining floor. So either the structural part of the floor under the bathroom should be thinner, or it needs to extend below the bottom of the other floors.



TYPICAL DETAIL OF FLOOR UNDER BATHROOMS, KITCHENS AND LAUNDRIES

- ➢ Remember the floor supporting the bath must be designed to take the bath, plus the weight of the water in the bath as well, as the weight of the person in the bath. Usually floors under baths need additional strengthening.
- ➢ Position of towel rails. Many bathrooms don't have sufficient towel rails, or the rails are too small so the towels remain folded or scrunched and they don't dry, or the rails aren't where they're needed. You usually want a towel close to the basin so you don't walk with dripping hands across the bathroom. You want to hang towels close to showers and baths so that you can easily reach them while standing in the shower and bath. Unfortunately towel rails are often added as an afterthought so there sometimes isn't space for them where they're needed. When planning the bathroom layout always give thought to where the towel rails will go, since this could impact the direction doors open and the location of windows, bathtubs and basins.

Cleaning up laundries

Most houses these days have clothes washing machines and dryers. If you have the budget you could choose to have a separate laundry, otherwise the machines could be located in a bathroom, garage or storeroom.

Laundries usually require:

- ➢ Power, water and waste pipes situated at the heights and locations to suit the average washing machine.
- ➢ A floor waste to capture potential flooding so the rest of the house isn't flooded.
- ➢ Sufficient ventilation to the outside so that the condensation from the dryer can be removed.
- ➢ Space to store dirty laundry.
- ➢ Floors which are easy to dry and shouldn't be slippery when wet.

In addition, the location of clothes washers and dryers should allow easy access to outside drying lines. Including a washtub for clothes is useful to soak extra dirty laundry. An area to iron clothes could also be convenient.

It should be noted that the laundry could provide additional storage cupboards for brooms and vacuum cleaners if space is available.

Home office and study – place to work and store papers

The design of a home office will depend on whether you have customers, clients or work colleagues visiting your office, in which case the office should have a separate entrance, or should be close to the front door. In general, especially if you have clients visiting you don't want to be disturbed by the rest of the family, so it shouldn't be overlooking the garden or pool where the kids could be playing, or near the kitchen or where others are watching television.

The office should allow sufficient cupboards and bookshelves for documents, as well as space for your desk. Consider the items that need to fit in the room, which probably includes computer, printer, shredder, etc. Always plan the layout so that windows won't cause reflections on computer screens, and at the same time you won't be looking at the computer screen with a brightly lit window behind it. Plan where your desk will be.

Also consider the location of lights so they don't cast shadows over your work area, but so there's sufficient lighting. Allow enough electrical sockets or outlets for all the items that need to be connected to power sources. It's usually necessary to allow data and telephone connections.

If there're visitors there should be place for additional chairs where they won't be sitting on top of you.

Since our offices often have sensitive documents it's useful if the room can be locked to keep out unwanted prying eyes.

If you and your partner both need space to work, then consider having two smaller studies or home offices. Otherwise ensure that there's space for two desks. Even if you don't work from home everyone has paperwork and bills to deal with so it's important to have your own workspaces.

Vehicle access to the property

Access points for vehicles to the property could be restricted to particular points. There can be restrictions to road access which include:

- ➢ The location of light poles, bus stops, utility pits and trees on the verge.
- ➢ Access cannot be near a rise or corner in the road you're joining which could block visibility to vehicles exiting the driveway.
- ➢ Access has to be a minimum distance from intersections.
- ➢ The location of water meters and electrical kiosks feeding the property could be in the way.
- ➢ Grade (height) differences between the property and the road. Properties which are much higher or lower than the road surface may require steep driveways. You should design driveways so there isn't a sharp transition (change in slope) from the driveway to the road as this causes some cars to scrape their front or rear on the ground and also creates visibility problems.
- ➢ Local authority and traffic authority permissions. You often can't have your driveway meeting the road wherever you wish, usually you need permission from the authorities unless you're using a location that's already designated.
- ➢ You don't want stormwater from the road flooding your driveway or garage.

Therefore driveways and garages need to be planned to take account of where access to the property is available. This could play a big role in determining the orientation and position of the rest of the house so it's imperative to ascertain the possible access points to the property early in the design process.

Garages – more than a home for your vehicles

Do you require garages for your cars? How many vehicles? What size – length, width and height? Do you need the garage for other purposes – such as hobbies (maybe you're often working on your cars, or you do woodworking)? Does the garage need to be secure?

Garages are an added expense. But they can:

- ➢ Reduce insurance premiums for your vehicles.
- ➢ Protect your vehicles from theft, vandalism, hail, bird droppings, sun and tree debris.
- ➢ Provide additional secure storage space.
- ➢ Allow space for hobbies.
- ➢ Allow you to get into a cooler car in hot summers, rather than one that's been baking in the sun.
- ➢ Add value to your home.

Considerations for your garage include:

- ➢ Local council and estate rules may limit the type of garaging.
- ➢ The position and orientation of your house – you don't want your garages to block daylight to the rest of your house, or to use the prime piece of garden.
- ➢ Access to the road.
- ➢ Accessible power points in the garage for hobbies and cleaning vehicles.
- ➢ Power points to charge electrical vehicles – even if you don't own an electrical vehicle now these charging points will become a necessity.
- ➢ Storage areas.
- ➢ The type of garage door – most people want an automated door so you require a power point for this. If you want a double garage, do you want two separate doors or one double door? Garage doors can be decorative and they could be a major focal point for some houses, especially if they're in the front.
- ➢ Lighting – you'll want additional lights if you'll be working in the garage or busy with hobbies.
- ➢ Floor finish – hard wearing painted floors can make cleaning easier and help reduce dust. But there're many other innovative floor solutions that could be more suitable for the purpose of your garage.
- ➢ The size of the vehicles using the garage. You don't want a garage that's too low, or short or narrow. Don't just consider your current vehicles, but also vehicles you could own in the future, or ones

that a prospective buyer may have. Remember to allow room for the garage door to open.

- ➢ Whether you want direct access to the house from the garage.
- ➢ Fire safety to prevent fires in the garage rapidly spreading to the rest of the house. Usually connecting doors should be fireproof and the ceiling void over the garage should have a fire wall or baffle between the void over the rest of the house. But regulations vary so check those in your area.
- ➢ Include windows, possibly high up or in the garage door to let daylight in.

It should be noted that garages can generate lots of additional heat. Petrol and diesel cars are always hot after use, so they make garages hot. In addition garage doors are poorly insulated and have gaps around the edges and top. Consequently garages can be hot places in summer and heat up the adjacent rooms in the house.

Case study: The main bedroom of one house was situated immediately above the double garage. The floor of the bedroom was often warm from the garage below which made the bedroom extra warm in summer. One would think that this would be a bonus in winter, but of course garages usually don't hold heat for very long in winter. As mentioned above the garage doors are poor insulators so in cool climates the garage can quickly become colder than the rest of the house.

Consideration could be given to using a heavier better insulated door and sealing gaps around the door, especially if you're planning on working in the garage often. You could install extractor fans to get rid of the warm air in summer, and they are also essential if the work you do in the garage generates fumes and gasses.

Balconies – looking out over the surroundings

A balcony can add value and also be an architectural feature of the house. However if the truth be told, many balconies are seldom used. Of course, a balcony may provide access to a view of the ocean, lake or mountains.

Sometimes it's relatively easy to construct a balcony over a portion of the house that's only a single level, constructing a flat roof instead of a pitched roof over that portion. Constructing a roof over a veranda on the

ground floor may provide the option to convert the roof into a balcony above.

Some considerations for a balcony include:

- ➢ The size. Some balconies are ridiculously small so there's little place even to place chairs. They should be a usable space.
- ➢ Neighbours could complain when balconies overlook their property.
- ➢ The balcony should be of a design that suites the house and the proportions of the balcony and the handrails should be in harmony with each other and the house.
- ➢ The balcony structure should always be designed by an engineer. It should be designed to support the weight of a crowd of people packed onto it. Even if you only need the balcony to support a few people you never know what future occupants of the house may use the balcony for. Numerous balconies have collapsed under the load of partygoers, or a crowd watching fireworks or a pageant.
- ➢ The handrails of the balcony must be sturdy and designed to meet the building regulations. Again, there have been numerous accidents caused when handrails on a balcony collapsed under the pressure of people leaning against them. The handrails must be securely fixed to the floor of the balcony and to the building walls. If the handrails are of brick or blocks they should be properly reinforced.
- ➢ The floor finish shouldn't be slippery, even when wet.
- ➢ The access to the balcony. You don't want the family or visitors accessing the balcony from your bedroom.
- ➢ Your privacy. Large balconies could allow those on the balcony to look into bedrooms.
- ➢ The balcony must have outlets to handle even the heaviest rain. The floor of the balcony should drain to the outlets so there isn't any standing water.
- ➢ The balcony floor should be lower than the interior floor to prevent flooding inside.
- ➢ Balconies should be waterproofed properly to prevent leaking.
- ➢ Consider whether the balcony that overhangs the lower portion of the house will cause the rooms below to become darker.
- ➢ Balconies should never appear to be an add-on.

- ➢ Consider what the underside of the balcony will look like if it's visible. Thought must be given as to how this will be finished off.

Case study: A relative had a house with a tiny balcony. The balcony was almost useless with barely room for a couple of stools. Eventually they enlarged the balcony giving it slightly more space. However in doing so the additional supports for the balcony, together with the larger balcony, reduced the daylight reaching the room below, making it darker than it already was. In addition, the balcony was constructed of a light metal frame supporting a steel mesh grid on which decking floorboards were placed. From the underside this looked terrible because you saw the metal frame, mesh and underside of the planks. In addition, when it rained the rainwater washed dirt from the balcony floor through the gaps, leaving dirty water streaks down the walls under the balcony.

The lowdown on basements

Basements can be useful and provide space for heating systems, extra storage and wine cellars.

When considering a basement you should know:

- ➢ It adds to construction costs and to the construction time.
- ➢ Excavating basements in rock is expensive.
- ➢ Where there's a high ground water table it could result in more expensive construction methods.
- ➢ If the basement is near and below the foundations of an existing building (even the neighbour's house) special precautions will have to be taken to protect and support these structures so they aren't damaged by the excavation of the basement.
- ➢ It's usually not possible to have drains in the basement as the floor levels are often below the local sewage networks, so installing a toilet or wash basin in the basement could be impossible, or it'll require the installation of an expensive pumping system.
- ➢ Basement walls and floor must be properly waterproofed to prevent water ingress from the soil. Even if the water table appears to be below the floor of the basement during construction there's no guarantee that the water won't rise up in the wet season. Remember, even one flaw in the waterproofing will be enough to have a leaky basement.
- ➢ Basements can be easily flooded.

➢ Adequate ventilation must be installed in the basement.

Designing adaptable homes

Your circumstances change with time. Families grow as you have children, then, they shrink as children leave to lead their own lives. But, even as your children grow-up they have different needs and interests. They're not going to be that baby in the cot which is close at hand for long, they'll eventually become teenagers who want their own space to enjoy with friends. As you age you have different needs, maybe now you leave home every day for an office, but at some stage you'll retire and spend more time with your hobbies, or even work from home. You'll eventually become infirm and steps might no longer be easy for you. Older parents could depend on you more (especially if something happens to one parent) and they might want (or have to) move in with you. When the time comes for these changes you may need to move to another house, or renovate your existing home to adapt it to these changes. But you can, with a little forethought and planning, ensure that your house is easily adaptable for many of these changes.

If you're becoming advanced in age you should design your house with this in mind. You don't have to include all the features now that a mobility impaired person needs, but getting the basic layout right now so that it's easily adaptable later will save future expense and work.

Designing the house so that children can have their own space, even separate entrances, could mean that once they've left you can convert that space to rent out. Being able to shut this area off from the rest of the house may be beneficial. Consider how you could repurpose bedrooms later when the children have left to become hobby rooms, home offices or work rooms when you retire.

With a multistorey house it's often useful to have at least one bedroom downstairs. If someone in the family has an injured leg they probably can't easily climb steps. But, when you're older you may find it easier to live on the ground floor. We've always found a spare bedroom with a bathroom on the ground floor useful for elderly visitors and relatives.

Children probably want a swimming pool and a garden to play in when they're young, but you'll find that they quickly grow up and you're left maintaining the swimming pool and garden that they seldom use.

But, it's not just you and your family that'll change. With time, the cost of utilities increase, there'll be new technology and new appliances.

The cost of labour will increase so it'll be more expensive to hire cleaners and gardeners. Fashions change and furniture, fittings and colours which were once modern aren't suitable anymore. Houses with a neutral décor can often be easily adapted to suit changes in fashion, tastes and furniture.

It's also about the home being adaptable for future buyers. For instance, you might desire a home theatre room, but a future buyer might not. If you've designed the room with no windows it's going to be difficult for the next person to use the room for something else. The same goes for converting studies to another bedroom, or vice versa, unless they've been planned to be easily adaptable.

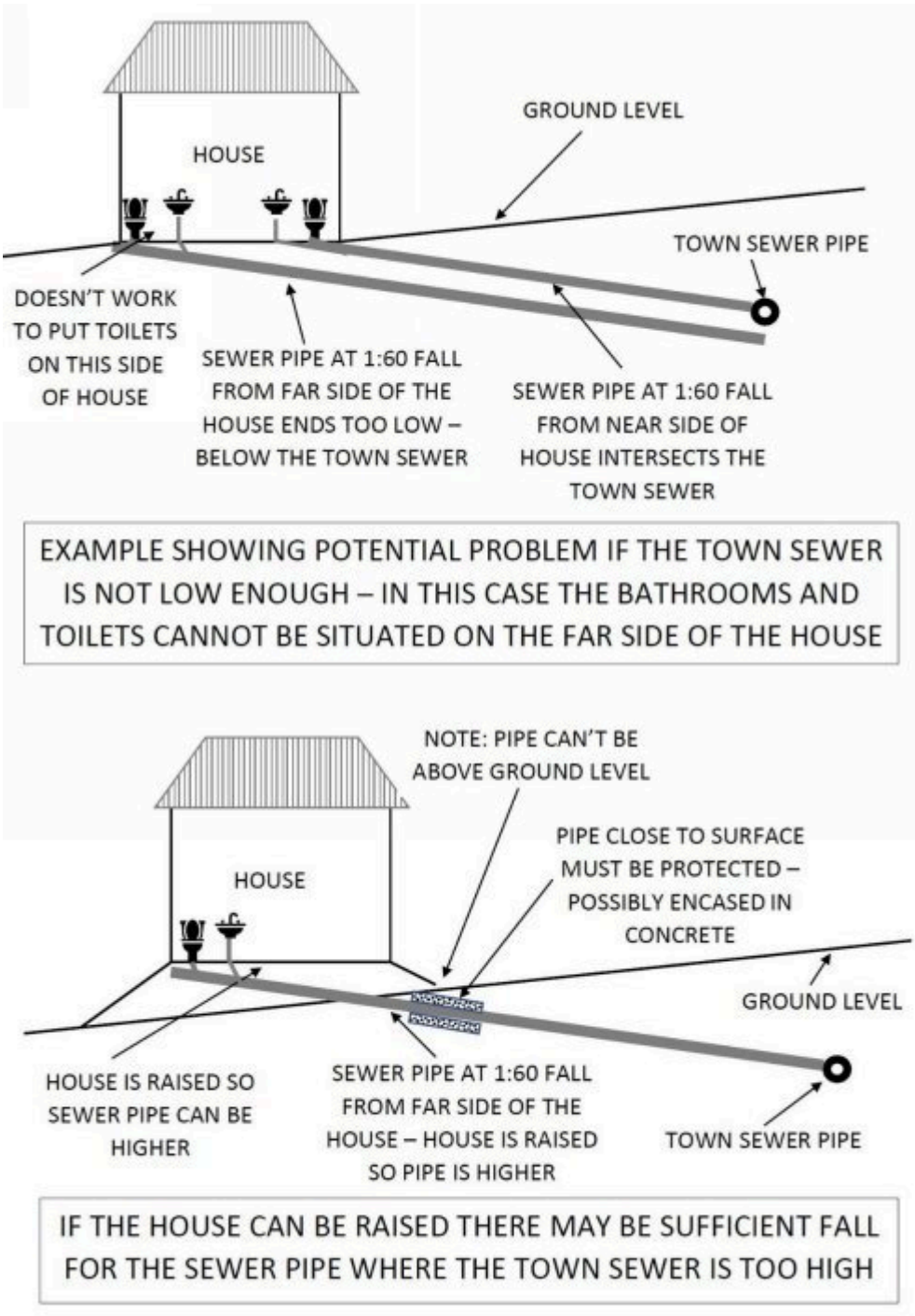
Determining floor elevations (heights or levels)

Determining the height (level) of the finished floor on the ground floor will depend on a number of factors which could include:

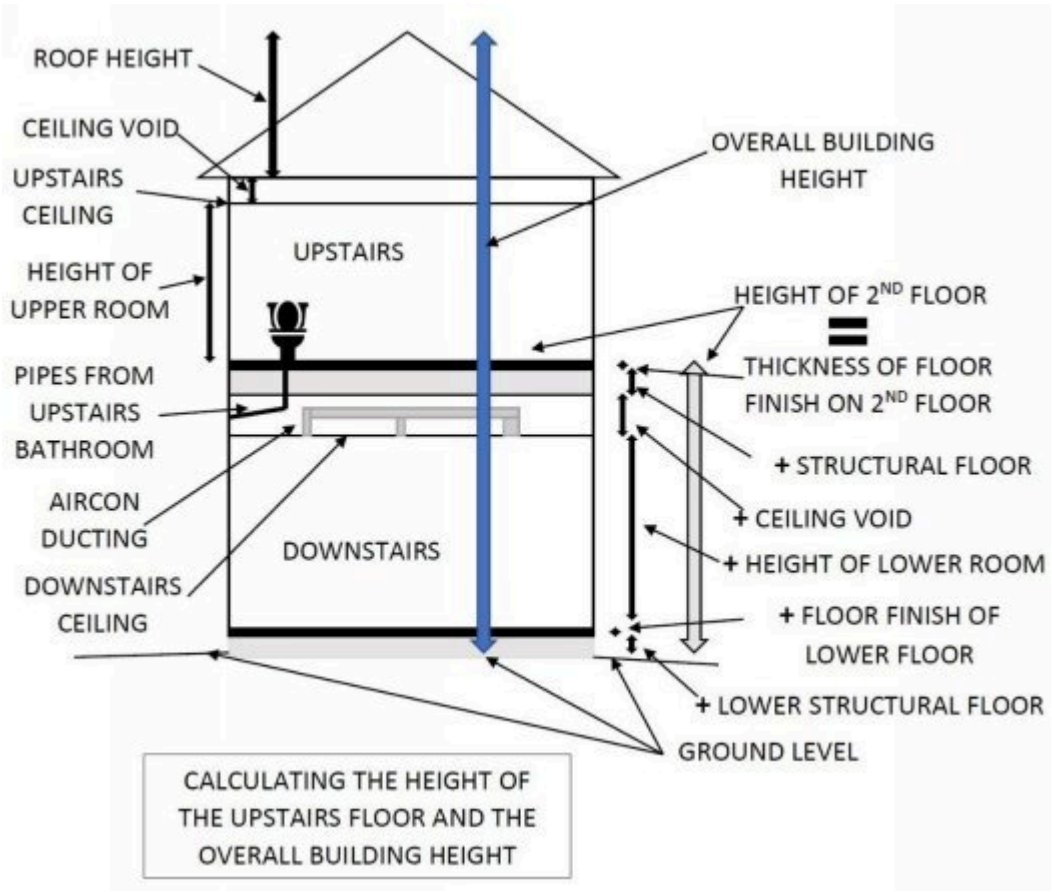
- ➢ The actual existing ground levels of the property.
- ➢ The planned finished landscape levels.
- ➢ Where there's an existing building that the new structure ties into, then the level of that finished floor.
- ➢ The thickness of the structural component of the floor (for example concrete slab) together with the thickness of the planned floor finishes.
- ➢ Height restrictions which apply to the height of the overall building. It may be necessary to lower the level of the ground floor so that the whole building sits lower on the property.
- ➢ The location, distance and depth of the town sewer connection. The sewer (wastewater pipes) have to flow downhill to this connection – see next page. Lifting the ground floor may provide additional height for the pipes. Of course, in this case the ground surrounding the house may have to be landscaped and lifted so that the sewer pipes aren't exposed above the ground.

The height of finished floor levels for the second floor depends on:

- ➢ The finished floor level of the floor below.
- ➢ The height under the ceiling of the rooms below.
- ➢ The thickness of the structural elements of the second storey floor (which could be concrete or timber) together with the thickness of the floor finishes (carpets, timber, tiles, etc) of this floor.



➢ The type, location and size of utilities which have to fit in the ceiling void (the area between the underside of the structural floor above and the ceiling) below. This could include wastewater pipes from showers, basins and toilets from the second floor and air-conditioning ducts servicing the level below. See later.



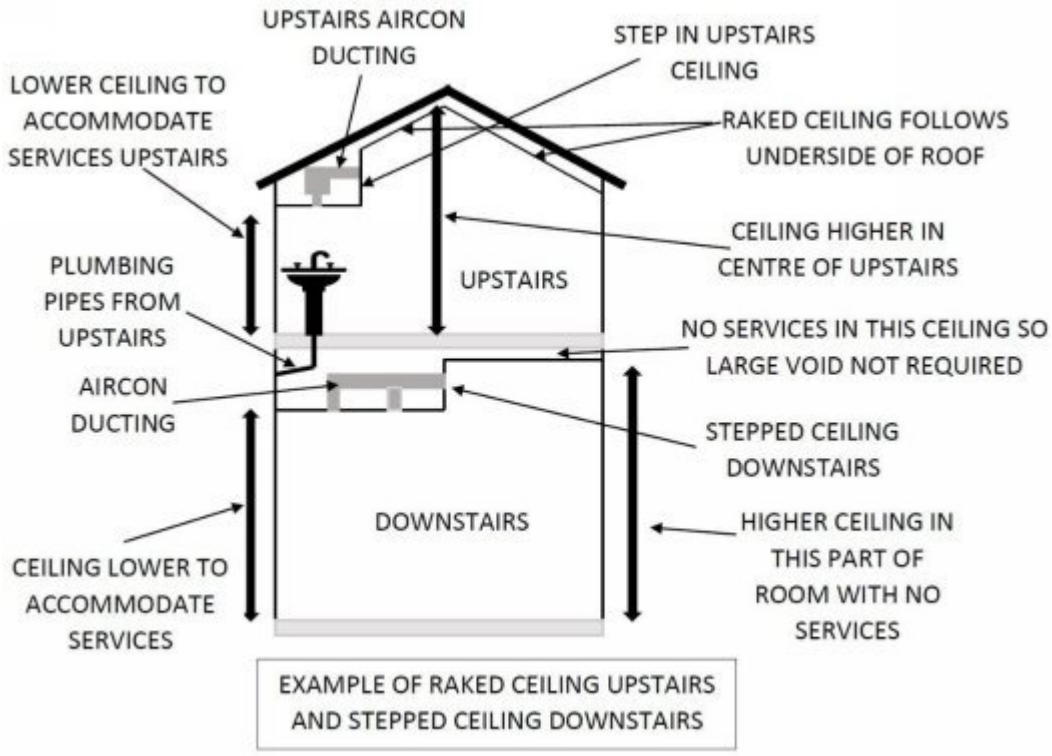
Ceiling heights – creating the illusion of space

Most building codes set a minimum ceiling height (height between the top of the floor and underside of the ceiling). However, many people prefer a higher ceiling which makes rooms feel less boxed-in and creates the illusion of space. Higher ceilings are normally a prerequisite for upmarket homes. Of course a higher ceiling means that the walls have to be higher which adds to the cost of construction. Higher walls usually means a higher roof, which could cause problems when the property has a height restriction.

Ceiling heights can be increased without altering the roof and wall height by having a pitched roof with the ceiling following the underside of the roof, so the ceilings are raked or sloping creating an effect similar to being inside a church.

Sometimes, on multilevel houses the ceiling for the lower levels has to be fixed at a distance below the underside of the floor above so that there's a gap for utilities such as air-conditioning ducts. (See later.) It's possible for the ceilings to have a stepped profile, being higher in places where it can be

higher. This creates interest and also aids demarcating an open plan room into different zones.



In double storey houses some parts of the house could have a double volume area where the upper floor doesn't extend over a portion of the lower floor. So in fact that part of the building is double height inside, with a ceiling five to six metres (fifteen to eighteen foot) high. This often creates a grand statement, especially in entrance halls, at staircases and in the main living areas. Another advantage is that light can flood the downstairs area from skylights or windows on the upper levels. In fact, to enhance this area many double volumes are designed to have windows extending from the lower level to the upper level. Although, remember that high windows are difficult to clean.

It's worth noting that a ceiling higher than three metres (nine foot) is difficult for the average person to reach, so it's best not to have lights mounted high in these ceilings where they are hard to service and repair. However, sometimes these areas are suited to hanging a chandelier.

Case study: Our home has a very large double volume living area with a wall of glass on one side. People entering the home are immediately impressed by the light, bright and open feeling in the home. The living area in summer is always cool and we seldom require

air-conditioning for this portion of the house, even in the heat of summer. Hot air rises keeping downstairs cool. Unfortunately it's difficult to cool the upstairs in summer because any cold air from the air-conditioning upstairs quickly sinks down to the lower level. Of course, in winter it's difficult to heat downstairs because all the hot air rises. So upstairs can be cosy and warm while downstairs is cold. The lesson here is that if you're planning a double volume area in your house you may consider being able to close this area from the rest of the house. For instance, in another home our entrance hall and main staircase had a double volume area which made an impressive entrance statement. From here double glass doors led through to the downstairs living areas. These doors remained open most of the summer, but we could close them when it was cold in winter, thus keeping the warm air in the downstairs living areas.

Windows – more than just letting daylight in

Windows provide natural light, ventilation, a view out, and are often an architectural element, even a statement.

In many building codes the minimum amount of natural light and ventilation is stipulated and windows cannot provide less than this amount.

However windows can be a security risk, they're poor insulators allowing heat to enter in summer and heat to escape in winter (which results in larger energy bills) and they're poor noise barriers.

Double glazing can improve sound and temperature insulation. There's also special glass types which help with sound and heat insulation.

Security screens and bars benefit security and these come in a variety of styles and types. Many of these can be unsightly, however some screens are designed to act and look the same as an insect screen.

Glass comes in different thicknesses and can also be laminated so that it's stronger and doesn't shatter easily. Most building codes and regulations specify the thickness and type of glass. Safety glass must be used in glass doors and large windows which could be easily broken and hurt someone.

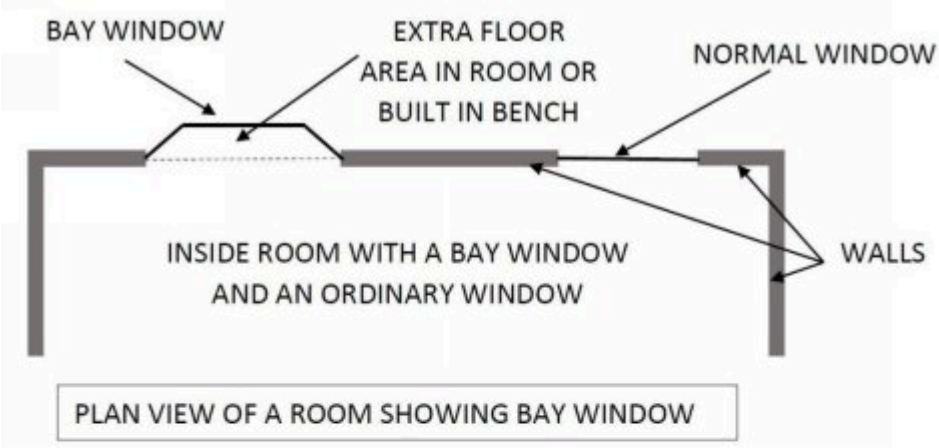
Windows have different opening mechanisms, which include sash (sliding up and down in the frame) louvered (glass panels which tilt) and those that are either hinged at the top or sides. The windows can also be opened by winding mechanisms, manually or in less common cases remotely. Top hinged windows often provide more protection from the rain

when they can be left partly open, however they often restrict breezes entering the building.

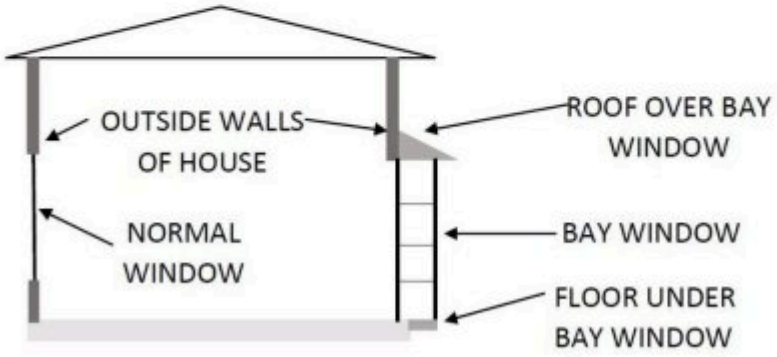
Consideration must be given as to how the windows will be opened, since windows that are high up in walls, or are difficult to get to, may be problematic to reach to open and shut.

Windows come in a wide variety of frames including aluminium, steel, timber and plastic. It should be noted that wooden window frames often require regular maintenance since they need to be painted or they'll eventually deteriorate. Aluminium and steel frames are good heat conductors so they more easily transfer heat into the house on hot summer days and transfer heat out of the house on cold winter days unless they're designed to have an internal thermal break.

The type of window and frame can have a big impact on the architectural style of the house and the final décor, so thought needs to go into them because they are permanent and difficult to change. For instance, large panes of glass in aluminium frames could provide a more modern appearance, while small panes in timber frames would give a more cottage look.



PLAN VIEW OF A ROOM SHOWING BAY WINDOW



SECTION THROUGH ROOM WITH BAY WINDOW

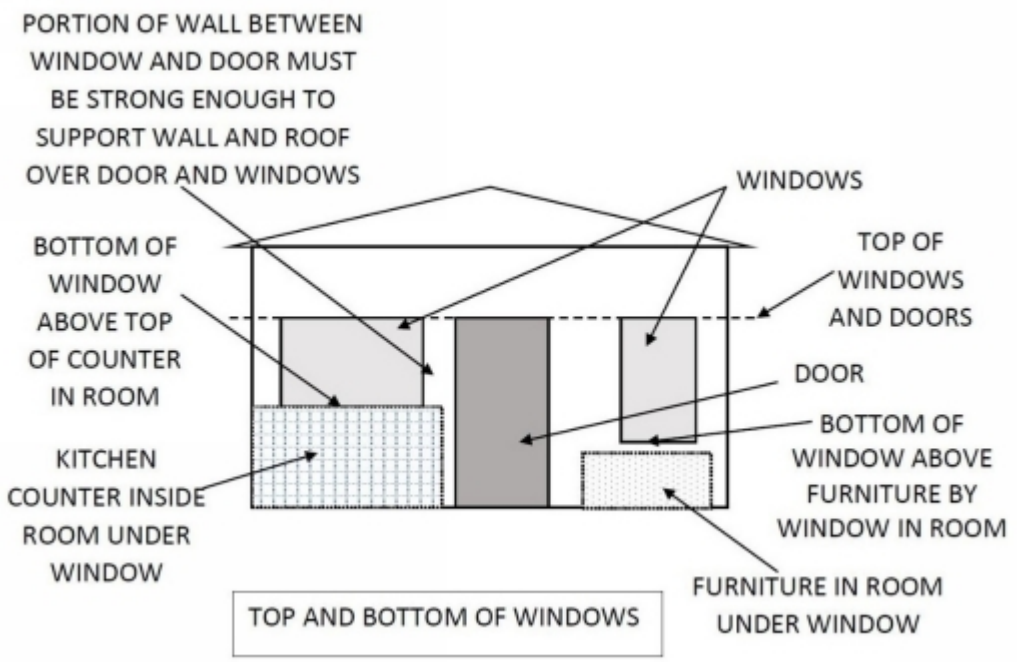
Bay windows help bring more daylight into your room and they add interest to the inside of a room and the outside of the house. However, bay windows don't suit all architectural styles. Large bay windows that go all the way to the floor are a means to increase the size of the room. Bay windows that don't go all the way to the floor could provide a neat space for a bench where you could sit and enjoy the added sunshine, but often these built in benches can be a nuisance making it difficult to reach the windows to clean and to open and close them. It should be noted that installing curtains, blinds or shutters to a bay window can be tricky and add additional costs. Care must also be taken to ensure that the cover over the top of the bay window is sealed or flashed properly against the wall of the house because these are often a source of leaks when it rains.

Windows often come in standard sizes (particularly steel and timber). Selecting a standard size is cheaper than picking a size and type of window that must be custom made.

Providing the opening portion of the window with an insect screen is essential in many locations.

Windows can be tinted, which helps keep the worst of the sun off furniture. The tint also helps with privacy. Always consider what type of window coverings (curtains, blinds (vertical or horizontal), shutters, etc) you will install and how and where these will be installed at the window since this could impact the detail, size and position of the window.

Generally the norm is that the tops of the windows should all be at the same height, which is usually also in line with the top of the door. However, in some cases you may choose to have doors or windows that go higher than normal. It's recommended that the top window heights generally don't vary unless there's a special reason.



When considering the height for the bottom of the window it's important to consider:

- ➢ Privacy. You generally want windows in bathrooms and toilets to be higher.
- ➢ The location of counters and cabinetry. For examples windows above sinks, basins and kitchen cabinets have to be higher than the finished level of these items.
- ➢ Furniture that you'll have in the room, particular the placement of beds and couches.

- ➢ The views out. If the window is designed to provide a view then consider where you want to be in the room to see the view and if you'll be seated or standing.
- ➢ Safety. It's not good practice to place windows lowdown on the stairs where someone might trip and fall through the glass (unless there's additional protection), nor where young children could easily climb out of an upper floor window.

What you should consider when deciding the position and size of the window:

- ➢ Remember, windows impact both the rooms inside and the façade of the house. Some facades are designed to be symmetrical and the position of the windows will impact this.
- ➢ The amount of natural light you want in the room.
- ➢ The direction of views.
- ➢ Privacy from neighbours, or the street.
- ➢ Streetlights and neighbour's external lights which could shine into bedrooms.
- ➢ The location of doors which could block the window when open.
- ➢ How the wall and roof above the window will be supported. Particularly large windows may require structural supports over the window which are supported on columns on either side of the window.
- ➢ The direction of the summer and winter sun. Do you want less summer sun and maybe more winter sun?
- ➢ The direction of the prevailing winds. Maybe you want cool breezes to come into your home, but also you might not want the worst storms battering your windows.

Windows must be watertight and must seal against the wall.

Skylights (Roof lights) – Filling dark places with daylight

Skylights are windows in your roof. They allow daylight to enter your home. Positioned over stairs and double volume areas they even allow light to enter lower levels of the house. But, skylights also provide ventilation if they can be opened. Hot air rises and an open skylight allows that warm air to escape. Skylights can also provide a view of the sky, both during the day and at night. Skylights could also be an architectural feature of the room.

Skylight types include round, square and rectangular, and can be glazed with moulded domes or glass. They can be roof windows, skylights or tubular skylights (solar tubes).

Tubular skylights (tubular daylight device) are tubular reflective cylinders which connect between a dome on the roof and the room below. These tubes could be up to ten metres (thirty foot) long (obviously the longer the tube the more light will be lost). The beauty of solar tubes is that they don't have to be straight and they can even pass through a room above (obviously they must be positioned in the corner or within a wall where they're hidden) getting daylight to a room on the ground floor. Sure, you're not going to see the sky through the solar tube, and it may seem just like a light, but it does mean that daylight reaches places where it isn't possible to have a window.

With a conventional window skylight if you have a pitched roof, as most houses, then the light from the skylight has to reach the room by passing through the roof void. Either the ceiling in the room is raked and follows the underside of the roof with a small box out around the skylight. Alternatively, with a flat ceiling, the ceiling must be boxed out around the skylight to form a rectangular or square shaft around the skylight. Constructing this boxout so that it widens from the skylight to the ceiling level below allows more light to disperse through the room.

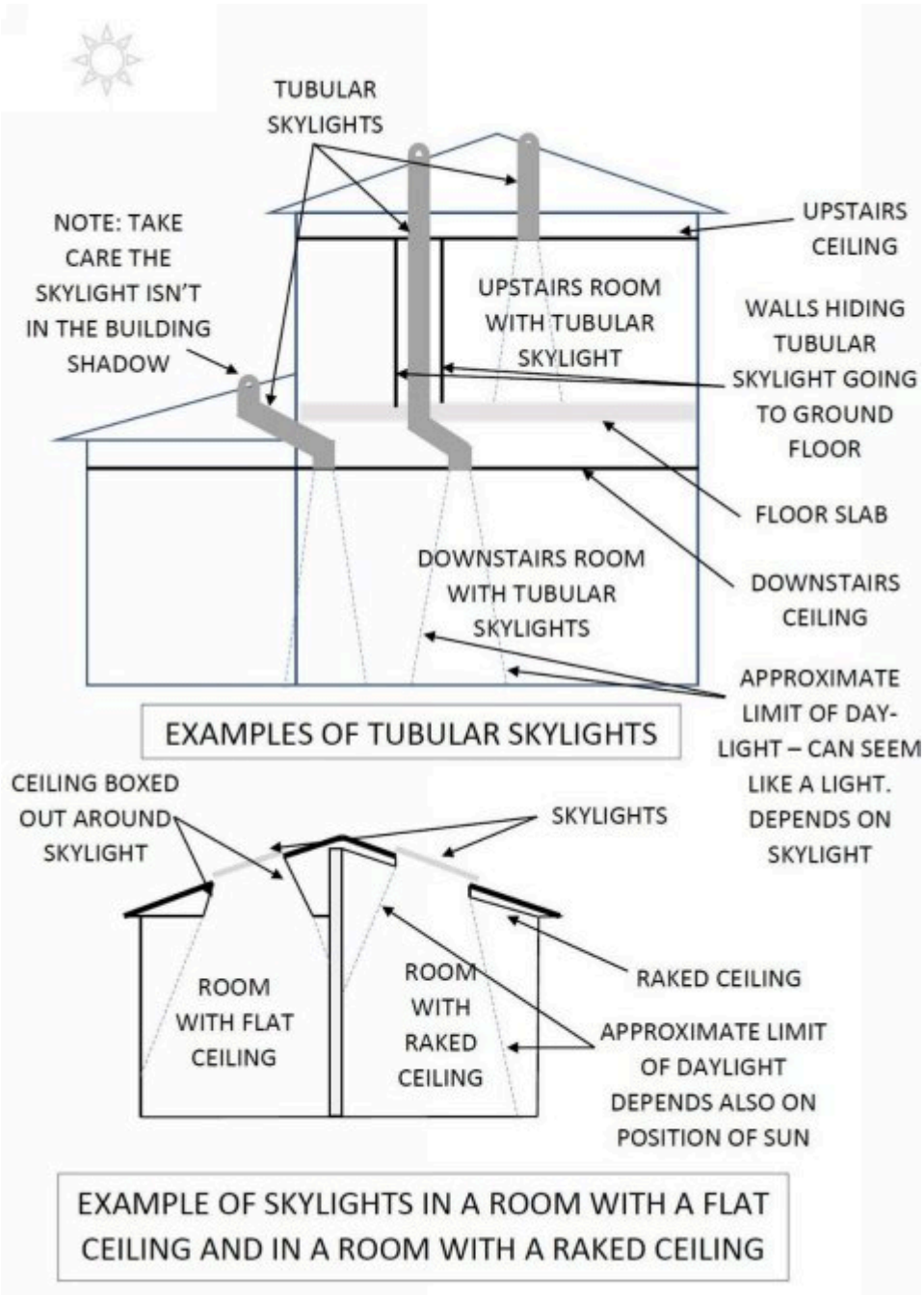
Skylights should be positioned where they're going to get the most sun, remembering that the sun moves during the day and its position varies with the seasons. The shape and size of the skylight will depend on the size of the room as well as the roof structure. Typically the skylight could be more than 5% of the floor area, although for sunrooms and conservatories you would be looking at bigger areas of glass. Skylight should fit between the roof trusses supporting the roof. Always try and position skylights such that they give an even spread of light in the room. Skylights can be constructed of glass, Perspex or polycarbonate and must be strong enough not to be cracked in a hailstorm and shouldn't deteriorate in the heat and with time.

Of course skylights can let daylight in when you don't want it. You may not want your bedroom flooded with daylight as soon as the sun rises – especially in the middle of summer when it gets light early. You also might not want your living room brightly lit in the afternoon when you're trying to watch sport on television. If you're surrounded by high rise buildings you

also don’t want people staring into your room from above (which isn’t possible with a tubular skylight). Blinds or integral shades can be incorporated into the skylight. You could also select glass that’s opaque to reduce and diffuse some of the light.

It’s important that skylights don’t allow heat to escape your home when heat is needed. In many countries skylights come with different energy ratings according to their efficiency at preventing heat loss or gain when they’re closed. Skylights should be constructed of double glazing or special glass. The surface of the glass should be coated to prevent UV penetration which could damage and fade furniture. Don’t forget to insulate the sides of skylight shafts and ceiling boxouts for skylights so that heat in the roof void isn’t easily transmitted into the room below.

Skylights come in standard sizes, or they can be especially manufactured. Larger skylights are more expensive than small skylights, not just because they’re bigger, but because they’re constructed of thicker materials to span the increased opening. The trick to any skylight is to ensure that where it penetrates the roof it’s watertight, but also so that it doesn’t form a dam on the roof upslope of the skylight trapping rainwater and snow, possibly then allowing the water to penetrate the laps and joins of the roof covering material. Large skylights are heavy and the roof structure may require additional supports to carry the load.

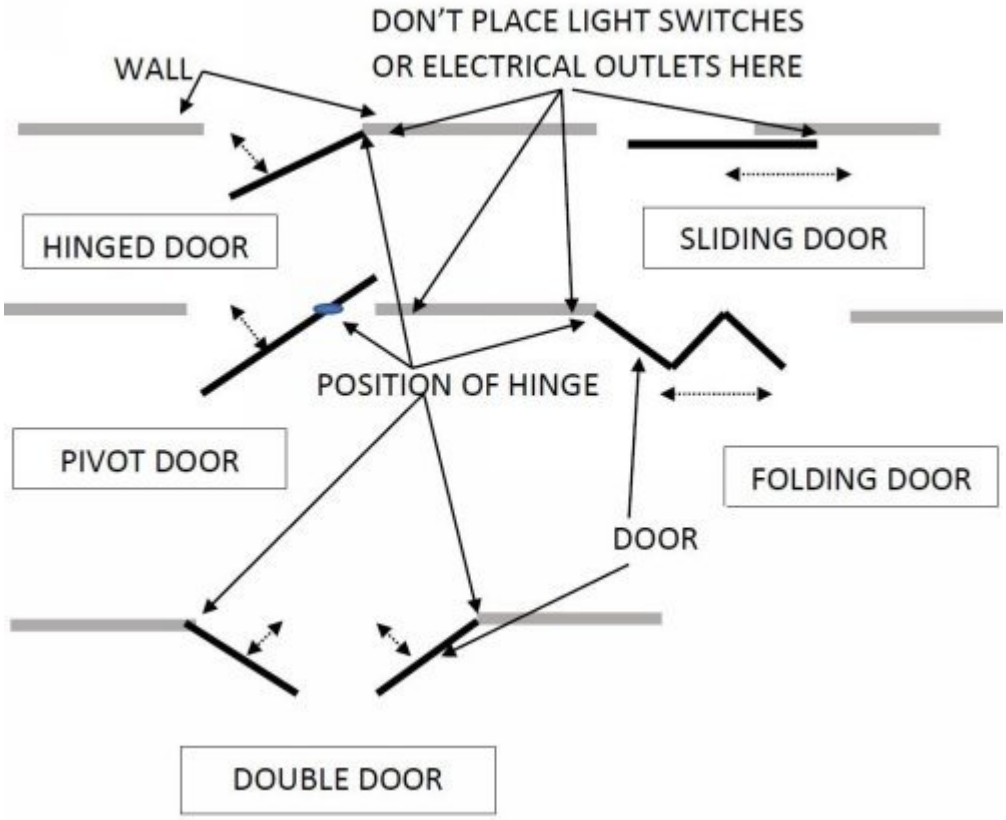


Generally skylights need to be cleaned regularly – between six and twenty-four months. In coastal areas salt will build-up on the outside. Leaves, dust and even bugs and spiders can quickly cover the external face. You would hate your sky view to be spoiled by bird excrement! Even the inside may require dusting off. Domed and sloping skylights allow some of the worst dirt to be shed off, especially when it rains.

Doors – connecting rooms and more

Doors are internal (between rooms), or external (leading outside). External doors are usually of a different construction to internal doors since they’re more robust for security and to withstand the weather. They must be designed to keep the rain, wind and cold out, so generally need weather seals.

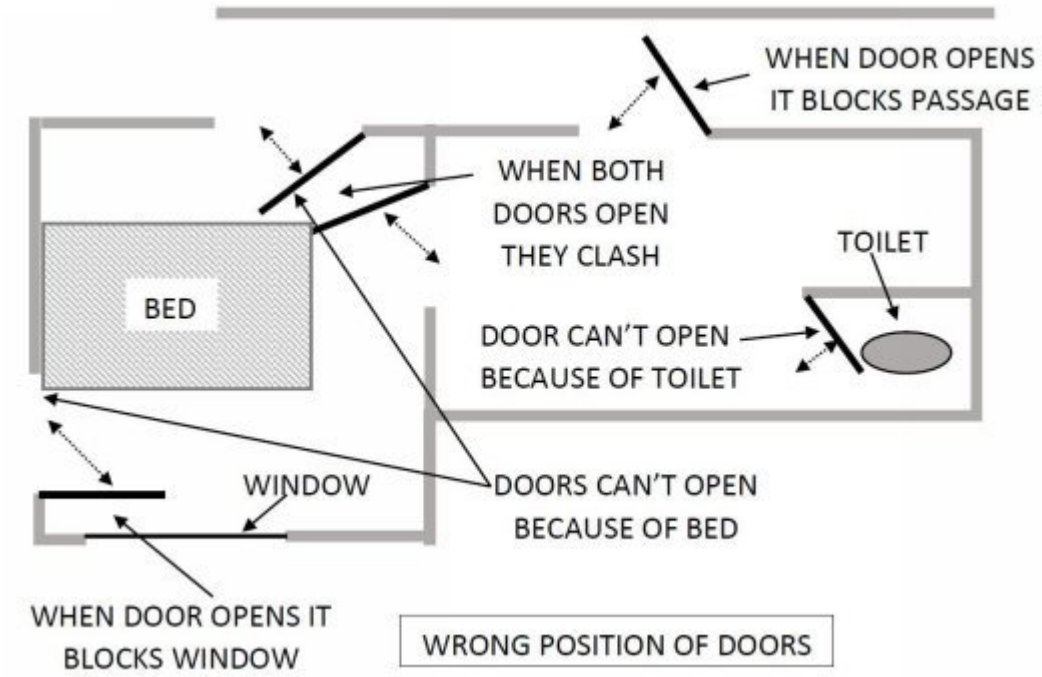
Doors have various opening mechanisms, which include hinged, folding, sliding and pivoting. They can be glass, steel, aluminium, timber, synthetic materials and a mix of these materials, and are in various designs to compliment your house’s style.



Sometimes there’s a requirement for fire doors – for instance building codes may require fire doors to be installed in doorways connecting the garage to the house, or for apartment doors connecting to public spaces. These doors are thicker and heavier to withstand the heat from a fire and retard its spread.

Heavy doors require sturdier hinges and doorframes and often extra hinges. Doors come in different sizes, but having doors that are too narrow can look stupid and they hinder the movement of furniture in and out of the room. People with mobility restrictions require wider doors.

The location of doors and the direction they open should consider the use of the room, possible the layout of furniture, and how the doors may clash with other doors, cupboards, light switches and windows. Also understand how they'll impact sight lines into the room – what will people see from outside looking through the open door into the room. The position of doors should provide natural movement so you don't have to step around the door.



The direction (or hand) of the door opening can be critical. Which way do you want the door to open, inside or outside, and which side must the hinges be? Sometimes the opening direction is dictated by legislation and external doors usually should open outwards for doors used as emergency exits. But, anyway external doors best open outwards since these are easier to seal to keep rain out. Doors also shouldn't open in such a manner that they could slam into someone walking past.

Doors usually require locks and handles (door furniture) so they can be opened, closed and secured. Locks on external doors are typically required to be easily opened from the inside in an emergency. There're a wide variety of door handles and locks, ranging from plain and industrial looking to more ornate ones that complement the design style and décor of the house. Locks, handles and hinges come in an assortment of metallic colours (usually a coating), such as copper, chrome, aluminium and brass. The

finishes can be shiny or ‘brushed’ (matt). It’s good practice to maintain the same finish for the hinges, locks, bolts and handles on the doors, and even preferably throughout the house. External handles and locks should be more hardwearing to withstand the ravages of the weather, particularly in coastal areas where the sea air will quickly corrode cheaper finishes.

You may want some internal doors, such as the door to your study (home office), to be lockable. There are a variety of different locks and some can be easily opened by burglars. You may decide to use locks that are operated by a code, or even ones that require a fingerprint or eye imprint.

Doors with glass panels allow additional daylight into the house. Glass internal doors also help lighten rooms, although obviously these may be unsuitable for bedrooms and bathrooms where privacy is required. Even doors with opaque glass lets in some light while maintaining a degree of privacy. Etching a design on glass panels in doors can create a nice feature, adding to the style of the house.

Doors, their handles, as well as door frames are an integral part of your house’s architectural style.

Building materials – so many choices

Houses can be built using a multitude of different materials and methods. The choice often depends on:

- The availability of the material. It could cause delays and add unnecessary costs when materials are selected which aren’t readily available
- The materials and methods which the local contractors are familiar with. Choosing other materials and methods may limit the contractors willing to construct the house, even adding to the costs. In addition, contractors using unfamiliar materials and building methods may result in poor quality.
- The material complying with the national, local and the estate rules and requirements. In some cases it may be possible to apply for exemptions, or to have new products approved, but this can be a lengthy process which isn’t guaranteed to be successful.
- The amount of maintenance required. Some materials require regular painting and varnishing. Who wants that!
- The location of your house. Coastal environments can be harsh and products should be chosen which can withstand corrosion.
- The architectural style of the house.

- ➢ The thermal insulating quality of the materials. This is particularly important for external walls and roof coverings in very hot or cold climates.
- ➢ The noise insulating qualities of the materials. You don’t want to be disturbed by external noise, nor do you want noise from inside your home or apartment disturbing your neighbours.
- ➢ Your budget.
- ➢ The speed of the build.
- ➢ The local weather conditions.
- ➢ The required strength. So wall materials supporting a second and third storey (floor) will have to be stronger than single storey walls. The span (distance between supports or walls) will dictate the type of materials and the thickness of floor slabs and beams.
- ➢ The complexity of the shapes required. Some materials are better suited to being formed and moulded into curves and complex shapes and patterns.
- ➢ Where the item will be used. Materials used in wet areas should be moisture resistant. Materials used outside must withstand moisture, plus the effects of temperature variations and the impacts of the sun.
- ➢ Your preference for using eco-friendly materials – materials that require low energy input to produce and to transport to site, and which minimally damage the environment. Also using recycled materials or products made from recycled material.
- ➢ Fire insulating properties.

Using standard materials and sizes helps minimise waste and can reduce the time required to construct the house.

Buildings can be steel or timber framed clad with various materials. Walls can also be constructed of concrete, bricks (which could be clay or cement), hollow blocks, natural or artificial stone. They could also be rammed earth or logs. The outside of the walls could be left exposed brick, be rendered, covered in tin, boards or hardwood timber. Walls should be weatherproof and insulated, durable and strong, while adding to the architectural style of the house.

There are a multitude of building materials so it’s important to select the right materials for where they’re required.

Resale – will people pay what your house cost?

Although in most cases you're designing a home for you and your family to live in and enjoy, it's pertinent to consider that most people eventually sell their homes and move on. You get another job, your family grows and then shrinks, your needs change and neighbourhoods evolve. So always consider how sellable your house will be in the future.

Of course, sometimes you're building a house with the specific purpose that you'll sell it (at hopefully a profit) or rent it out. In this case it's imperative that you consider what will appeal to the average purchaser, or renter, that's looking for a home in the area. Yet, you also need your house to stand out from the crowd.

What will appeal to others could impact the number of bedrooms and bathrooms, the provision of garaging or off-street parking, the layout of the house, the size of the garden, the choice of finishes, fittings and fixtures and colour choices.

Be aware that some items don't add value to the house, or certainly don't always recoup the money that you've spent on them. So for instance, someone isn't going to purchase your house solely because it has the most expensive appliances, fittings and fixtures. Sure, they could add some value, but the chances are that the average person won't appreciate their true value. Pools, spas, outdoor kitchens, theatre rooms and wood panelled libraries all seem like grand ideas, but they'll cost money, and usually more money that another person will be willing to add to their purchase price of the house.

Staying within budget

Of course you must design a house that won't cost more than your budget. Designers should be told what your budget is. Your budget could dictate the size of house, the type of construction, the materials, the fixtures, fittings and the finishes.

But your budget should never dictate the quality of the construction.

When budget is an issue it may be possible to plan the house so that it can be built in stages. So for instance, you might not have money now for a swimming pool or garages, but orientating and positioning the house correctly could allow for these to be added later. You might not be able to afford to tile your bathroom walls to full height now but it could be an easy fix later.

However, it will be expensive to install cheap floor tiles now, then rip them up later to replace them with more expensive tiles. It's also expensive to make structural changes and enlarge rooms. But, often cheaper light and sanitaryware fixtures and carpets can be easily upgraded to more expensive desirable items later.

Further expansion – planning for the future

If this is a first phase of a project, or you think that you may want to extend the house at a later date when there's more money, or when the family grows, then it's worth considering what you might do and how you'll do it. This could influence the position of the house on the property, the location of doors and windows, the orientation of the house, the internal design of the house and even the structure and design of the roof. Spending a bit of money now to plan what you may do in the future could save you problems and unnecessary expense when you eventually extend the house. Of course, these future plans aren't cast in stone since requirements, ideas, trends and fashions will change with time, but at least having some understanding how you can add extra bathrooms, bedrooms or garages, and planning for these now will allow flexibility when you finally decide to proceed with something similar.

The safety of family and visitors is vital

It's imperative to consider the safety of occupants and visitors to your home. Designing your house to comply with the latest building codes is a first step in ensuring your house is safe. A few important safety items to consider include:

- Install smoke detectors.
- Floor finishes in showers, bathrooms, kitchens, verandas and entrances should be such that they're non-slip, even when they're wet.
- Only use electrical, plumbing and gas fittings and fixtures that comply with the local standards.
- All plumbing, electrical and gas installations should be done by competent and licensed installers.
- All swimming pools must have a fence and a child proof gate to prevent unsupervised small children accessing the pool.
- Steps should always have an even constant tread height and step size.

- ➢ Ensure all stairways and steps are sufficiently illuminated.
- ➢ Balustrade railings must be such that they can support people leaning against them, and designed so that small children can't squeeze through them or climb over them.
- ➢ Opening windows on upstairs levels should be designed so small children can't easily fall to the ground below. This could mean ensuring that the bottom of the opening portion of the window is at least one metre (three feet) above the inside floor level, or such that the window can't be opened wider than about one hundred and twenty millimetres (five inches), or that there're rails or security mesh screens which prevent children accidently falling from the window.
- ➢ Avoid trip hazards on floors.
- ➢ Don't have sudden changes to floor levels or steps in the middle of rooms.
- ➢ Finishes close to heat sources such as stoves, heaters, air-conditioning units and fireplaces must be able to withstand the maximum heat and more generated by these items.
- ➢ Glass in doors, large windows and opening windows should be shatterproof and at least five millimetres (one fifth of an inch) thick. Check local building regulations.
- ➢ Glass doors, and large windows sitting at floor level should be marked such that they are clearly visible so people won't accidently walk into them.
- ➢ Ensure that external doors can easily be opened from the inside in an emergency.
- ➢ Counters and railings shouldn't have sharp corners and edges which could hurt someone.

Will your home be secure?

Security is a growing concern in some areas. It's best to include your required security features in the design stage so that they don't appear an addon later with exposed wires, etc. Security fears could influence:

- ➢ The type of external doors and locks. Heavy sturdy doors may require stronger door frames.
- ➢ Whether security gates are required. How will these open?
- ➢ If internal doors need locks.

➢ If a built in safe should be installed. Safes come in various sizes and security and fire ratings. Check the space inside, since often safes appear large from the outside but have limited capacity inside. Safes are heavy, so floors may have to be strengthened to support them.

➢ The types of windows, burglar bars, window locking systems and window security screens.

➢ The requirements for lockable garaging for cars.

➢ Requirements for alarms, which could be motion activated, as well as fitted to doors and windows.

➢ The type of fencing around the property.

➢ The need for security cameras.

➢ The choice and positioning of external lighting.

Installing security features such as alarms, window locks and bars will reduce insurance costs. But it's always important to ensure that the security features aren't unattractive, detracting from your house. Nor should they negatively impact your use of your home. Care should always be taken that the security measures don't hinder the escape of occupants of the house in the event of an emergency, such as a fire.

Don't let your house burn down

Unfortunately numerous homes burn down each year. Not only do people lose their home, but they lose their personal effects, treasured memories, and sometimes even their pets and their own lives. House fires can be devastating and they take hold very quickly.

House fires are caused by:

➢ Faults within the house structure, which could include:

- Faulty electrical wiring causing a spark, or heat build-up.
- Faulty appliances, such as air-conditioning or stoves, which cause a spark, or heat build-up, which then ignites flammable material.
- Leaking gas from damaged, poorly fitted, or old gas pipes or fittings, which then ignites when encountering a flame or spark.
- Faulty chimney flues allowing sparks to get onto the roof, or heat to build-up, causing combustion of flammable materials.

- ➢ An accident within the house which could include cooking oil catching fire, candles being knocked over or accidently coming in contact with clothing, curtains or other materials, electrical or gas heaters being knocked over or coming in contact with clothes and curtains, cigarettes not being extinguished properly, and sparks or embers from an open fireplace.
- ➢ Fires coming from the outside of the house, which could include bush fires, neighbouring house fires spreading to your home, and lightning strikes on your house.

Accidents are difficult to design against, although proper design and construction can eliminate faults and even protect against lightning strikes. Installing smoke alarms will assist with the early detection of fires enabling occupants to escape and early action to be taken to fight the fire. Having a fire extinguisher and fire blanket readily accessible may help to extinguish small fires.

In areas prone to bush fires there're a number of things that can be done. These include:

- ➢ Installing sprinkler systems to wet the roof.
- ➢ Having additional water storage tanks and pumps not reliant on electricity to maintain water pressure to firefighting systems.
- ➢ Keeping trees and vegetation away from the house.
- ➢ Using fire resistant materials for exterior walls and the roof.
- ➢ Building a fire resistant bunker within the house that can withstand extreme heat and which can provide shelter to occupants, documents and valuables, in a fire.

Building materials and construction techniques must comply with fire codes for your area. In particular wall and ceiling materials must have the required fire rating to prevent the rapid spread of fires. Fire resistant materials should be used in all areas that could be subject to heat build-up, such as around fireplaces and stoves. All electrical installations and fittings must comply with the codes.

For adjoining houses where walls touch there should be firewalls extending up inside the roof void, closing tight against the underside of the roof covering to limit the spread of fires between the houses.

Weather – don't let your home be blown away

It's important to consider the normal weather conditions that can be expected and design the house accordingly.

- ➢ When building in areas subjected to cyclones, hurricanes, typhoons or tornedos there’re usually special building codes that must be complied with. Even if there aren’t, it’s best to design your house to withstand the high wind speeds that’ll be experienced.
- ➢ In hot areas you’ll want to shade the house as much as possible, keeping the direct sun off walls and windows. Eaves and wide verandas help keep the house cooler. Large trees keep the house and garden cool. Take advantage of cooling breezes. If required, include external blinds, awnings or shutters which can be lowered to keep sun off windows. Additional insulation in the ceiling and walls, as well as double glazing will help insulate the house. It should be noted that hot direct sunlight causes some finishes (such as painted or varnished doors and plastic light fittings) to deteriorate rapidly, so use alternative products.
- ➢ Houses located where heavy rainfall occurs should have gutters and stormwater drains large enough to cope with the rain. Ensure that walls, windows and doors are watertight. Driving rain can blow under doors so they should have seals and weatherboards. Eaves extending beyond the walls of the house protect walls and windows from the worst rain. It’s useful to have a large covered patio or veranda to keep outdoor furniture dry. Add cover over the front door and even other doors so you aren’t left standing in the rain while searching for keys and folding umbrellas. Where rain gear is regularly required and when footwear could become muddy, consider providing a boot room or coat room where this gear can be removed, dried and stored. High rainfall can also encourage damp and the growth of moss. Take extra care with keeping water away from the house.
- ➢ Lightning strikes can be a danger in some areas. Ask for specialist advice. Some roofing materials could catch alight when struck by lightning. Houses should be properly earthed. In some cases additional lightening conductors may have to be installed, particularly for buildings in elevated positions in lightning prone areas.
- ➢ Hail stones can damage roofs, windows, awnings, cars and exposed air-conditioning units. In areas prone to hail you’ll want to ensure that your vehicles are undercover in a garage or carport. Eaves

help protect windows. Using thicker glass provides additional protection. Thicker and tougher roof covering materials should be used in hail prone areas. Hail stones also cause blockages of gutters and stormwater drains which results in flooding. Hail guards (mesh grids) over gutters keeps hail out the gutters. Hail can also build up on parts of the roof causing rainwater to backup and leak into the roof, so carefully look at the roof design in hail prone areas.

- Snow can build up on roofs causing overloading and eventually leading to the roof collapsing. Roofs should have an adequate pitch so that snow regularly falls off. The designs should be simple. Roofs that have pitch changes going from a steeper pitch to a less steep pitch, or which have valleys, can result in ice dams (melt water from the snow collects at a point on the roof, then freezes, forming a dam) which blocks the melting snow and causes it to leak back up through roof sheeting and roof tiles. Generally the roofs should be as smooth as possible in the direction the snow moves to ensure that ice dams don't form. Minimise the use of roof windows and skylights. Where possible orientate the roof so there won't be one part of the roof permanently in shadow in winter, which would mean that the snow stays for months before melting. The roof should be well insulated from warm air in the house, since this could encourage the snow to melt and then refreeze when the meltwater reaches the edge of the roof away from the warm inside air, thus creating an ice dam at the edge of the roof. Extra care should be taken to ensure flashings extend far back to prevent water ingress should an ice dam form on the roof. Roofs must be designed to support the additional weight of the snow. Note that snow also exerts a dragging force down the roof covering material, therefore the fixing of roofing materials must be sturdy enough to hold the sheet down and also strong enough to resist the shear forces exerted along the length of the sheet by the weight of the snow. Snow shedding and falling from the roof can injure people walking below and damage items, such as cars and air-conditioning systems. Snow guards (which are correctly designed and secured) can reduce the snow shedding. Using dark coloured roofing materials aids with melting the snow. It's

possible to install de-icing cabling to prevent ice build-up and to encourage the snow to melt. The exterior of the building should also avoid ledges or relatively flat windowsills which could allow snow to accumulate, eventually falling onto unsuspecting people walking below.

- ➢ Buildings in cold climates should be orientated to maximise sun striking walls and windows in winter. Walls, windows and ceilings must be well insulated. Efficient heating systems should be installed. Windows and doors should be fitted with draft seals. It's useful installing an airlock, or double entry door into the house, which enables people to enter the first door, close it, take off their outer clothing and boots, hanging them up here to dry out, before entering the second door into the house. The majority of the warm air from inside is retained by this door and cold drafts are kept out.
- ➢ Wind can be destructive at its worst, but also annoying. In areas prone to strong winds it's useful to design the garden and situate the outdoor areas where they're sheltered from the worst of the prevailing wind. Sometimes in windy coastal areas specific plants should be planted that can withstand the wind. Roofs, pergolas, carports and verandas must be designed to withstand the ravages of wind. You also don't want items that are going to rattle and bang in the wind, like unsecured shutters and outdoor blinds. Wind can drive the rain onto windows so consideration should be given to the type of opening window you install. Top hinged windows provide more protection from driven rain. Roofs covered with tin sheets, or roofing tiles, must have a minimum pitch to prevent rain from being blown up the roof and under the tiles and roof flashings.

Designing a house for all seasons

Seasons impact temperatures, the direction of the sun and even the wind. Some houses designed for hot summers are horribly cold in winter. Consider how external conditions will vary between the seasons to ensure your house is great at all times of the year. Generally you should be designing houses to make the most of the winter sun, while lessening the impact of the summer afternoon sun, making the most of prevailing cooling winds in summer, but avoiding the fiercest winter storms.

Different seasons also impacts your choice of plants. Some plants thrive in hot climates and can't take the cold. Parts of the garden could be in full sun in summer and other areas are in full shade in winter. This impacts what you can plant where. Orientating the house slightly differently, or designing the garden differently, could avoid these extremes. Some trees lose their leaves in winter – which creates a huge mess. But, these trees allow more sun and light into the property and house in winter, while providing shade in summer.

Mobility restrictions – we all get old

If someone in the family has mobility restrictions, or if you're planning on spending your retirement in the house, it's prudent to ensure that the house is designed with these requirements in mind. This could include:

- ➢ Having wider doors and passageways to allow wheelchairs access.
- ➢ Ensuring that the interior of the house is on one level with no steps. Where the house is two or more floors then installing a lift, or ensuring that there's at least one bathroom and bedroom downstairs with the living areas. Alternatively designing the stairs so that a chair lift can easily be fitted.
- ➢ Ensuring that external access to the front door is accessible for wheelchairs.
- ➢ Designing showers without steps and with wide doors.
- ➢ The main bathroom could be bigger to aid future movement and access problems.
- ➢ Designing the garden so it's easily accessible from the house and is reasonably level with firm pathways.

Privacy

Some of us prefer our privacy. Unfortunately, it's becoming more difficult to ensure privacy in crowded cities and in smaller houses and apartments. In fact, too much privacy can also be a bad thing and mean that burglars can break in undetected when your house is vacant.

Privacy impacts the internal layout of the house. You should consider the location of rooms – do you want the main bedroom right by the front door where all visitors walk past (you don't necessarily want to keep internal doors closed). It also impacts the layout of bathrooms. So some are happy to have the on-suite bathroom as part of the bedroom with no doors

separating the rooms, while many prefer some privacy, even from their partner. As discussed privacy is also impacted by the location of doors and how they open.

Having large windows to maximise the amount of natural light and the view can enhance the internal spaces of our house. But, you probably don't want people looking into your house, especially at night. Windows can be positioned so neighbours can't see in, or can't see into the whole room. It's possible to screen windows by installing shutters, one-way glass, blinds or curtains. One-way glass isn't always effective at night when the lights are on inside. Curtains, shutters and blinds block out the daylight, making the room dark. Shutters and blinds with louvres allow light inside and let you look out, while obscuring the view from the outside if they angled down. It's also possible to design the house so the windows look into a screened courtyard. Planting trees and shrubs in front of windows will provide privacy but this could block out lots of daylight.

Storage – a place for everything

We never seem to have sufficient storage, possibly this is because many of us hoard junk, maybe we love clothes, or have lots of hobbies. Wherever possible rather have too many cupboards, whether it's in the bathrooms, bedrooms, kitchen, laundry and even the garage. Consider where you'll store the garden equipment, barbeque, clothes, food, cooking utensils, tools, linen, hobby equipment, the children's toys, gadgets, suitcases, brooms, vacuum cleaners, etc.

Future buyers will always appreciate extra storage. Of course space can be gained by clever planning of cupboards, shelves and drawers, and it's worth looking at various storage ideas and solutions. Poorly planned cupboards, which aren't deep enough, that don't have adjustable shelves, that are too high, which don't take your stuff properly, that are difficult to access, or that are weak and flimsy, are annoying and inefficient. Before planning your storage space look at your current needs and use this as a starting point for your design. Fitting a storage solution because it's the cheapest option isn't the best solution. See Chapter 6 for more storage ideas.

Some storage must accommodate heavy objects, or bulky items, so must be properly planned. Doors on cupboards keeps dust out, and hides unsightly items. Lockable doors are useful to secure valuables.

Allowing extra space in the garage and installing shelves and racks there provides valuable storage.

There's often wasted space in roof voids, so incorporating loft storage and access in your home can be a small additional cost that adds value to the house and additional storage for all your needs.

Hobbies

Many of us have hobbies and the layout and design of the house should take these into account. Artists need a room with lots of natural light. Car enthusiasts might require large garages. Most hobbies require space, possibly extra sheds, garages, rooms, or cupboards.

Smart homes – the next generation

Technology is changing daily. Many day-to-day functions are automated, or can be controlled remotely. We have air-conditioners that come on at a set time, or that are remotely controlled, or come on when you're nearing the house. Lights switch on automatically, at a voice command, or are controlled remotely. Window blinds go up and down depending on the angle of the sun. Ovens come on at your remote command. Fridges tell you what you're short of and should buy on the way home.

A smart building is an integration of different building components and the implementation of communication and management system which should make your use of the house more comfortable and convenient, while helping to reduce operating costs and energy consumption. Smart homes comprise a network of connected products for controlling, automating and optimising day to day home functions. It allows for remote controlling devices as well as direct communication between various items. The internet of things will grow exponentially. We now have voice recognition and smart intelligence. Smart homes will become more valuable as it becomes a necessity rather than a luxury addition to your home.

What's important is that the smart systems:

- ➢ Can easily be upgraded when technology changes.
- ➢ Are reliable and won't crash.
- ➢ Are easy to use.
- ➢ That the systems don't just 'look cool' but that they're actually functional and will contribute to the comfort and convenience of your home, while also reducing the running costs.

- ➢ Will not be make and model specific, which could limit their adaption and use. That they'll easily integrate with main-stream products and software.
- ➢ Aren't easily hacked and can't be interfered with by external signals.

Being able to hardwire products rather than rely purely on wi-fi systems can make them safer and less likely to be hacked.

The rate of change of technology is increasing, and products that are the latest today can be replaced next year. The choice of the wrong technology could be an expensive mistake.

Communications

Communications in your home includes allowing for:

- ➢ Intercoms and/or doorbells at the front door.
- ➢ Intercoms at front gates if required.
- ➢ Television outlets where required.
- ➢ Telephone and data links where required.

Electrical sockets (outlets, plug points)

Don't you hate it when you can't find an electrical outlet close to where you need it, or when there're insufficient outlets. Ensure you have sufficient electrical outlets where they're going to be needed. Rather err on the generous side, because using extension leads and overloading electrical outlets is hazardous and is often the cause of house fires.

Locations for electrical sockets include:

- ➢ On either side of beds. Usually at least two, one for a lamp and one for phone charging, or electric blankets.
- ➢ Where televisions could be located – usually several are required for the various connected devices.
- ➢ On kitchen worktops. Also in kitchens for dishwashers and fridges.
- ➢ In laundries for washers and dryers plus extra.
- ➢ In studies or home offices.
- ➢ In garages for power tools. Also, provide a socket to charge electric cars.
- ➢ Externally for use by electrical gardening equipment. Note these should be waterproof.
- ➢ In lounges and family rooms where standing lamps, heaters, fans and other items may be used.

- ➢ In bathrooms for electrical razors and hairdryers. Also for heated towel rails
- ➢ Generally spaced at regular intervals around the house. Think where you might be charging mobile phones, computers and other devices and where you'll connect a vacuum cleaner.
- ➢ In addition, electrical outlets are usually required for water heating systems, air-conditioners, alarm systems, electrically operated awnings and blinds, security cameras, intercoms and electrically operated gates and doors.

Generally it's good practice to have the electrical socket covers and switches matching the light switches (see below). The outlets shouldn't be located where they could get wet (unless they're waterproof) and they should be easily accessible. Consider the location of furniture and how this could impede access to the electrical outlets and also where cupboards and counters will be so the outlet isn't in the way, or inaccessible.

Lights – more than just a light

Lights are an important part of your finished house. They illuminate the general area, light specific areas of interest creating a highlight effect, they create mood and ambiance and they can be a feature in themselves (illuminated, or even in some cases when they aren't on).

I'm sure we've all been in rooms, especially hotel rooms, that were dark, gloomy and uninviting. Then, there're rooms that are blindingly full of light so that they're stark and unappealing, almost like a hospital operating room. Careful choice of the type of light, the number of lights and their positioning, can add or detract from your home. You don't want to feel like you're battling to see, while at the same time you don't want to be overwhelmed by too much light. The number and variety of light fittings available can provide daunting decisions. Like everything, don't be influenced by price alone. You install cheap light fittings and invariably they'll look cheap.

It's important to ensure that you use light fittings which are approved for use in your country. Be especially careful when purchasing fittings online as these may not be safe and won't always comply with local regulations. Equally important is ensuring that lights are installed in accordance with their purpose. Some lights are only suitable for indoors and shouldn't be installed outside where they could be damaged or pose a safety

risk, while many light fittings aren’t suitable for bathrooms or other wet areas.

Some lights generate lots of heat and they’re a fire risk when installed in areas which aren’t well ventilated, or where they’re in contact with flammable materials.

Always consider how easy it’ll be to replace the lightbulb when it fails. Some light fittings are difficult to open to replace burnt out bulbs. Reaching lights in high ceilings, over stairs, or in double volume areas, is difficult and requires specialist equipment.

Chandeliers look fantastic in some houses, but remember light fittings can be dust collectors, so always think who’ll be cleaning the light and how easily it can be done.

Study where you want illumination. You don’t want lights casting shadows over work areas nor do you want lights shining onto television screens. If you have artwork you may want lights illuminating it.

Light fixtures can add to, or detract from, the overall décor of the room. Some lights are modern, others have a more industrial look, some are beach house, and others have a distinct period or antique look. Using the right light fittings can help create the right look and style and are a valuable addition to the room.

To vary the amount of light in a room, either to create mood, or to take account of the varying daylight entering the room, consider having the lights on dimmer switches which alter the amount of illumination. (Note that some light fixtures and light bulbs aren’t suitable for dimmer switches.) Alternatively, a better option is having lights in a room connected to two or more light switch circuits, so that all the lights don’t have to be on at the same time.

Positioning of light switches is important since you don’t want to walk across a dark room to switch the lights on. Light switches should generally be fitted close to doorways. It’s important to consider the type of doors and how they’ll open. You don’t want light switches to be behind the door when it opens, or be hidden by a sliding door. For passageways, rooms with two separate entrances, and stairs you should consider connecting the lights to separate switches located at either end of the passage, the top and bottom of the stairs and at both entrance doors of a room, so that the lights can be operated from the different locations. Depending on legislation, sometimes light switches for bathrooms must be located outside the room.

Light switches aren’t always the prettiest feature so try and locate them together where possible. Light switches come in various designs and colours. Some blend into the wall so they’re less noticeable, while others form a decorative statement in their own right. Consider how the light switch suites the décor and style of the room. Switches that look antique are suited to heritage homes, while those that are sleek and modern will look out of place in a heritage house. Ensure light switches match the electrical sockets. In general when using metallic colours you should keep the colours consistent in the room, even matching the door locks and handles. Having some fittings in a room copper while others are silver will look mismatched.

Lights can be triggered to come on when they detect movement. This is particularly useful for external lights. The lights go off automatically after a few minutes when movement ceases. Having movement sensors in rooms, particularly in bathrooms, can mean that the lights only illuminate when someone is in the room and then are off when the room is empty. This helps reduce power usage.

Installing energy efficient lights is important to reduce power consumption.

Hot water systems

Choosing the right hot water system is important. Not only are they expensive to install, but they can be costly to run. It’s also frustrating if you frequently can’t get hot water, so the system must be efficient, effective and suitable for the number of occupants in the house. There are various types of hot water systems which include:

- ➢ Electric storage, which uses a heating element inside a tank to heat the water, similar to an electric kettle. These are the most expensive to operate since they keep the whole tank of water at constant temperature, even when hot water isn’t being used.
- ➢ Heat pumps are efficient water heaters that extract heat from the air to heat water. They can use less than one third the electricity of electric storage water heaters. Heat pumps can operate effectively in temperatures as low as -10C (14F).
- ➢ Continuous flow gas water heaters heat water only when it’s needed. Gas may be piped from an external utility supplier or from refillable bottles.
- ➢ Gas storage unit heaters are similar to electric storage, but use gas.
- ➢ Continuous flow electric heaters which heat water when it’s needed.

- Solar. Depending on your climate, a substantial portion of your family's hot water needs could be provided from the sun's energy. To supplement the sun on cloudy days, or when household demand is high, solar heaters can have either electric or gas boosting. Solar systems have both the collectors and storage tank mounted on the roof, or they're split, with the storage tank located at ground level.

When selecting your system some important factors to consider include:

- Household size. Remember to consider your family's size in the future – you don't want to be installing a bigger system in 10 years' time because there're more people living in the house.
- The cost. Consider not only the price of the system and installation, but also the operating costs over the life of the system, which will be far in excess of the original purchase price.
- Planning or building controls that limit solar panels being placed on roofs.
- Your local climate, or shading from neighbouring trees or buildings, may limit solar access to your roof.
- The available energy sources. Natural gas may not be available in your area.
- When tank storage systems are used, then note that they're bulky. This impacts where they're installed and when they're installed in the building process. If large tanks are placed in the roof space they may need to be installed before the roof or ceiling are completed. Full tanks often weigh several hundred kilograms so the roof must be able to support the tanks.
- Gas heaters should be installed outside.

Heating – staying cosy in winter

Heating and cooling your home could be a major cost, so it's wise to select the best systems that'll be the most efficient and convenient to use, with the least ongoing energy bills.

When choosing heating and cooling systems it's important to consider:

- Hot air rises and cold air sinks. Place hot air outlets or heat sources close to the floor and cool air vents near the ceiling.
- The size of the house.

- ➢ The size of the rooms.
- ➢ How you can minimise heat loss and keep the cold outside your house.
- ➢ The materials your house is constructed from.
- ➢ The finishes inside your home. Carpeted floors are usually warmer than tiled floors. Solid timber, or sprung timber floors help insulate the ground floor from the cold below.
- ➢ Your budget.
- ➢ Aesthetics. Log fires can be appealing, while some wall radiators are ugly.
- ➢ Energy consumption of the device.
- ➢ The availability of fuel. Some fuel isn't readily available, or might not be in the future.
- ➢ The ease of maintaining the system.
- ➢ Legal requirements. Wood and coal burners aren't allowed in many urban areas.
- ➢ Safety, particularly where there're small children who could come in contact with hot surfaces resulting in injury. You also don't want a heating system which could set fire to your home.
- ➢ What's the most environmentally friendly and sustainable.
- ➢ How easily the temperature can be regulated.
- ➢ The life span of the system and whether it can be easily replaced if necessary.
- ➢ How long and how often the house needs to be heated. Fireplaces are ideal for quick short bursts of heating but may be impractical to keep running for days and months at a time.
- ➢ The outside temperature.
- ➢ If some rooms in the house can be closed off when they're not in use. Open plan houses may be difficult and take longer to heat.
- ➢ Where you can locate the heating system. Fires require flues or chimneys. Hot water systems require boilers.

Like many systems there might not be a perfect one for your requirements, but it's important to select the one that's the most practical.

Spending money on an energy efficient home that will remain cool in summer and warm in winter is the best investment. However, in colder climates additional heating will inevitably be required.

Heating can be generated by:

- ➢ Underfloor heating, which is installed under tiles or carpets, or in concrete floors. These should have individual controls in the room with a thermostat for temperature control. Good systems can remain on for extended continuous periods. Underfloor heating is effective because it creates an even heating and the heat rises from the floor.
- ➢ Open fireplaces create a warm and inviting ambience. Who doesn't like sitting in front of a roaring log fire in winter? These could be wood burning, coal or anthracite. Unfortunately, most are very inefficient allowing a large portion of the heat to escape up the flue or chimney. In addition, large volumes of cold air are drawn into the room to fuel the fire. To improve the efficiency it's possible to have exposed flues which can radiate some of the escaping heat back into the room. Many urban areas restrict the use of solid fuel burners because of the air pollution generated. Flues should be able to be closed to prevent warm air escaping when the fire isn't in use.
- ➢ Fireplace inserts can be more effective than open fires as they allow the heat generated to be circulated back in the room.
- ➢ Reverse cycle air-conditioning, where the air-conditioning system can generate warm air. Often these systems aren't totally effective as the air vents are normally situated in the ceiling, making the area close to the ceiling the warmest part of the room (as mentioned earlier hot air rises). To be more efficient the ducts must be insulated and sized correctly and there should be temperature controls for each room.
- ➢ Portable heaters, which could be radiant, gas, panel or oil heaters. These can be brought out in winter and packed away in summer. They're efficient when placed close to the occupants of the room but are generally unsightly and a nuisance. They're cheap to buy but are usually expensive to run.
- ➢ Permanently mounted electric panel heaters are often expensive to run and the heat source may be masked by furniture.
- ➢ Heat air shifters are fans and ducting which shifts warm air in the house to cooler places in the house. Obviously these are relatively cheap to operate as they aren't generating heat, merely circulating

heat to where it's needed. So hot air that has risen to the upper floor of the house at ceiling level can be sucked in and circulated downstairs to where it's needed. They can also suck warm air from the roof cavity and pump it into the house.

- ➢ Hot water systems or radiators. Water is heated in the house by gas or electricity and the hot water is circulated via pipes through radiators which give off heat. In some countries where there're thermal springs it's even possible to tap into these springs to use the natural heated water.
- ➢ Gas heaters are often cheaper to run. They can be unflued, but then there must be adequate ventilation to prevent the build-up of dangerous gases. Some building regulations may not allow the use of unflued gas heaters.
- ➢ Decorative log and flame appliances are often no more than that – decorative. They consume energy but generate little heat.

Cooling – you don't have to sweat in summer

When deciding on an appropriate cooling system you should consider some of the points in the previous section.

There are various cooling systems. These include:

➢ Fans, which comprise:

- Ceiling fans which are a cost effective solution for cooling. They come in various sizes and designs. Some fans are more efficient at moving the air. Some can be noisy, so it's important to check them, preferably by visiting a store that has fans on display. Fans usually have variable speeds and can be controlled by a controller fitted to the wall (however this requires electrical wires to feed to the controller which is a problem if it isn't installed during construction) or by a remote control (an easier solution when installing fans in a completed house). The ceiling usually has to be strengthened with timber or steel where the fan connects so the fan is firmly attached and can't come loose, or rip the ceiling apart. Care must be taken that lights are not situated above the fan blades because this could cause the fan blades to cast flickering shadows. Fans often come as a combined fan and light fitting. The length of the fan support is usually adjustable (can be cut shorter) so that fan blades are located safely above heads.

- Portable fans, which can be used in summer and packed away in winter. They can be positioned to direct a breeze to where you're sitting. They're often a cheaper option, but cheaper models are obtrusive and ugly. Fans have the disadvantage that they send paper flying and some portable fans are noisy.

➢ Evaporative coolers use the evaporation of water to cool the air which is then circulated into the house. They won't work in humid climates. They're relatively cheap to operate, although they do require power and water connections. Efficiencies vary depending on the type of unit. Evaporative coolers also come as portable units.

➢ Air-conditioning – see the next section.

➢ Geothermal heat exchangers. These have pipes circulating underground or through a body of water. Warm air is pumped from the house down through the water or the cooler ground, where the air in the pipes cools, then the cool air is returned to the house. They're expensive to install, but a properly installed system will have low energy consumption and work even on the hottest days.

➢ Solar heat cooling extracts the hot air generated in the roof space (which would normally transfer back through the ceiling into the house) and replaces it with the outside air. If this is done at night when the air temperature is cooler it can help keep the house cooler longer during the day. This doesn't actually cool the house but only reduces the rate of heat build-up. It requires a simple low energy fan.

The cold facts on air-conditioning

There are a plethora of types and sizes of air-conditioners. These include:

➢ Portable ducted systems with a duct connecting outside (often through a window). They're usually only suitable for small rooms and aren't that efficient. They generate condensate water which needs to be regularly emptied so it doesn't overflow onto the floor.

➢ Portable split systems have an outdoor unit connected to an indoor unit with a hose via a window. Again they are only suitable to cool one room.

➢ Through wall or window systems, where the unit sits partly out the building. These cool individual rooms. They can only be

positioned in external walls.

- ➢ Split systems with an outdoor unit connected via permanently installed pipes (in walls and ceilings) to an indoor unit. The outdoor unit can be positioned some distance from the indoor unit. They are usually suitable for individual rooms and come in various sizes for different size rooms.
- ➢ Ducted systems. Generally these have an outdoor unit that connects via pipes to an indoor unit, usually placed in the ceiling, which collects air from within the house via a ‘return air-grille’ connected by a duct to the unit. The unit cools the air, then circulates the cool air through ducts (tubes) located in the ceiling void leading to air-vents, or grilles, in the ceiling of rooms. The ducts are sized according to the amount of air required to cool a room and are usually constructed of galvanised metal and are square or rectangular. This type of duct isn’t flexible and has to be fabricated specially to get around corners and obstructions. Smaller ducts can be flexible tubes. The vents come in various sizes, shapes and colours and usually have vanes which direct the air to where it’s needed. Ducts and vents which are undersized will mean that the room isn’t cooled properly.

Multistorey homes are more complicated since the cool air needs to be distributed from the unit located in the ceiling void in the upper floor down to the lower levels. This requires ducts to carry the air down through the upper rooms. Nobody wants to see exposed ducts so walls should be designed so there’s a large cavity to accommodate the ducts running from the upstairs ceiling void down to the lower rooms. In addition, the upper floor must be designed to have openings in it for the air-conditioning ducts to get to the level below. (Frequently this’s overlooked and holes must be chopped through the floor when the air-conditioning ducts are installed, entailing additional costs and weakening the floor.) When the air-conditioning ducts reach the rooms below they have to run in a ceiling void to reach the location of the air-vents or grille outlets. It’s therefore important when designing the house to ensure that there’ll be sufficient space to fit the air-conditioning ducts above the ceiling, and that the height of the rooms allows for this. See later.

Each room requires different amounts of cool air, which depends on the size of the room and its location, so the system should be designed so the amount of cool air can be regulated, with each room having its own temperature control – even shutting the system off for rooms which don't require cooling.

Tips for air-conditioning include:

➢ Ensuring there's adequate airflow around the external unit and that the unit isn't sucking in the hot air it's just expelled.

➢ Outside units often generate lots of hot air, which can 'cook' plants nearby.

➢ Shading the external unit where possible.

➢ Outdoor units can be noisy so consider your neighbours.

➢ Outdoor units must be accessible for maintenance and repairs.

➢ Outdoor units should be secured so that they can't fall over and cause damage or injury. Often outdoor units require a base (usually concrete) or a frame fixed to the roof or a wall on which they sit. Some outdoor units can weigh over one hundred kilograms (two hundred and twenty pounds).

➢ The outdoor unit requires a power point.

➢ Air-conditioning units should be able to operate within the ambient temperatures that occur in your area. Some air-conditioning systems won't cope in extreme temperatures.

➢ Both the indoor and outdoor units will generate condensation. Indoor units should have drip trays which slope towards pipes to catch condensation and take the water outside. Outdoor units could wet veranda floors and paving.

➢ Air-conditioners come in different sizes, operational efficiencies and running efficiency. The cheapest system to install may not be the best system and it could be expensive to operate, so check the energy efficiency.

➢ The amount of cooling required will depend on:

- The size of the room.
- The insulation in the room.
- The location of the room. Rooms on the western side of the house will be heated by the afternoon sun.

- The appliances in the room. Cooking adds to the heat in the room. Some electrical appliances generate extra heat.
- The number of people in the room. We all generate heat.
- The external air temperature.
- For double storey houses, the upstairs rooms usually require more cooling because the roof void is often hot making these rooms hotter. In addition, cold air sinks, so cool air will escape the upstairs area via stairs and double volume areas sinking to the lower floor.

➢ Service air-conditioners regularly and clean air filters.

➢ Ducted and large air-conditioning systems should be designed by experts.

Walls – more than just dividers

Walls serve a number of purposes:

➢ They demarcate the interior of the house into rooms.

➢ External walls should be weathertight.

➢ Walls serve as a sound insulator.

➢ External walls and some internal walls support the roof or the floor slab of an upper storey.

➢ Walls tie together to make the complete structure rigid and stable. One wall on its own might not withstand a strong wind, but tied to another wall at right angles it becomes a more stable and stronger structure.

➢ They act as a fire barrier to slow down the spread of a fire. In open plan houses fires can rapidly spread through the house.

➢ They act as a heat insulator to protect the inside of the house from heat and cold outside.

➢ They're security to prevent someone breaking in.

➢ They hold windows and doors in place.

➢ They may support suspended shelving, cupboards, curtains, blinds and railings.

➢ They can add to the architectural style of the house. So there're various finishes and materials that can cover the wall and the wall should be able to support these finishes.

There are a plethora of products that are strong and when combined with other materials provide most of the properties set out above. When

deciding on materials for your walls you must ensure that they satisfy the requirements above while being architecturally pleasing, meeting regulatory provisions, that are readily available, which are suitable for the location, which require minimal maintenance, and ones which your contractor will be familiar with.

Remember that thick walls are usually good insulators but they take space out of the rooms (making them smaller) and often require a larger footprint for your house. Thick external walls may even result in your house going outside the property's building lines which isn't allowed.

The roof over your head

The roof of your house serves a number of purposes, including:

- ➢ Making the house weathertight.
- ➢ Insulating the home to keep heat out in summer and the cold out in winter.
- ➢ Acting as a noise insulator.
- ➢ If there are eaves, then providing shading and protection to the exterior walls of the house, including keeping the worst weather off the walls.
- ➢ It's often a major architectural feature of the exterior of the house.
- ➢ Sometimes even forming a feature on the inside of the house, such as when the ceiling follows the inside line of a pitched roof, or when the roof structure (trusses, timbers and beams) are visible inside the home.
- ➢ The roof space being used for an attic storeroom, an attic living area (particularly if there're skylights or dormer windows that allow light in) and be the location for hot water heaters, mechanisms for lifts, air-conditioning units and ducting.
- ➢ Allowing light into the rooms below when there're skylights. It could also be designed to allow morning sun or winter sun to enter some windows.
- ➢ Allowing bathroom vents and chimney flues to exit from the rooms below.
- ➢ The exterior of the roof providing a surface on which to fix solar power and hot water panels.
- ➢ The roof structure supporting ceilings, hot water systems, air-conditioning units and even in the garage mechanical hoists.

➢ In some cases forming a balcony for an upper level or a roof top garden.

Roofs come in a variety of shapes. They could be:

➢ Flat.

➢ Mono-pitched (skillion) where the roof slopes in one direction only. These could be suitable where you want windows to let light in from a particular direction, or to emphasise the views. So normally the high end of the roof would be on the side where the windows are, thus maximising the height of the windows and hence the light or view.

➢ Triangular or gable roof which slopes in two directions.

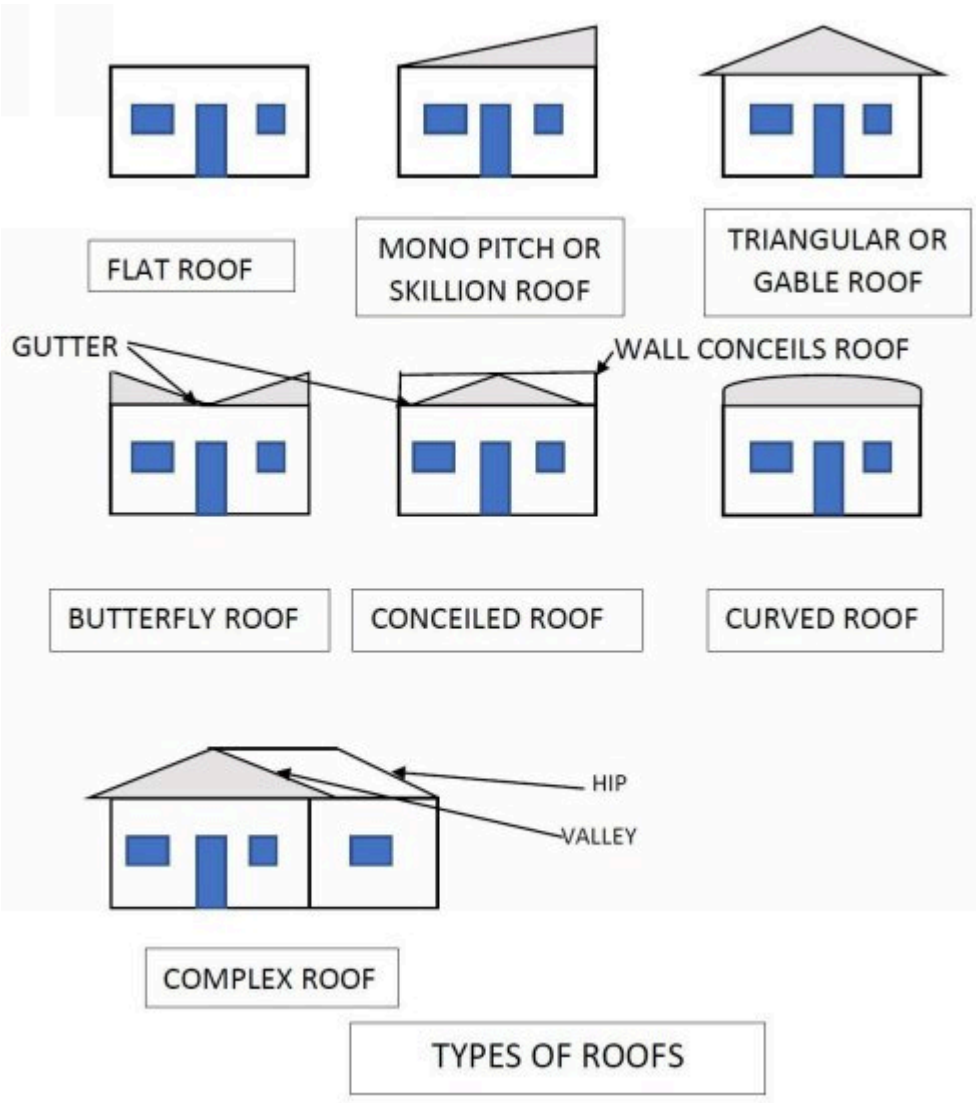
➢ Hipped roof which has three, four or more pitches.

➢ Butterfly roof with two skillion roofs sloping to a central gutter.

➢ Various curved roofs.

➢ Hidden roof, where the external walls of the house project higher than the roof, thus hiding the roof from view.

Case study: The roof on one double storey house we lived in is a very steep tin roof. A problem occurred every time anyone needed to work on the roof. Nobody can walk on the roof and there aren't points to attach safety lines. The only access is to erect a scaffold, which is expensive, and to further complicate matters a pergola along one side of the house makes this difficult. So repairing television antennae, installing solar panels and skylights all become very costly.



Roofs are covered by a variety of different materials including, tin or aluminium sheeting, timber, concrete, tiles of various materials including, clay (terracotta), slate, concrete and timber, grass (thatch) and green coverings which include various plants.

Flat roofs can have various advantages including:

- ➢ They result in a house with a lower profile which may be necessary when rules dictate a maximum height for the house. Flat roofs are generally less likely to block ocean and mountain views from houses behind – meaning happier neighbours. They better blend into the surrounding countryside if this is required.
- ➢ They can be used as an additional terrace or outdoor area – an advantage when there are views. For terraces, suitable balustrading

or handrails and a stair access must be provided, and waterproofing on the roof must be protected.

- ➢ If designed correctly they can be used for roof top plantings, creating a greener roof, possibly also adding to the insulation of the house.
- ➢ It suites certain architectural styles.
- ➢ It's easier to fix solar panels and air-conditioning units and this equipment can be more readily serviced.
- ➢ In the future, if the roof is designed correctly it will be easier to extend the house by adding an additional level (rooms) on top of the roof, without having to remove the roof and impact the rooms below.

The shape of the roof, the choice of the covering materials and the structure of the roof will depend on:

- ➢ The available materials.
- ➢ Local specifications, in particular estate rules which could prohibit the use of some materials, or dictate the roof shape and height.
- ➢ The shape of the footprint of the house.
- ➢ Normal weather conditions. Flat roofs aren't right for snow. Some materials have good insulating properties and some withstand tropical storms better.
- ➢ The size of the house below the roof, in particular the clear spans required. Large open plan rooms require the roof to be able to span (cover) bigger distances between walls, which some designs and materials can't do.
- ➢ The architectural style of the house. For example, houses in an Italian or Spanish style probably require a pitched roof covered with terracotta tiles, a Greek style might be better with a flat roof, while country cottages may require a pitched tin or slate roof with a veranda.
- ➢ The roof covering materials' colours and how they blend into the style and colour pallet you want to incorporate on the exterior of the house. A pitched roof could be 30 to 50% of the exterior façade of the house that people see, so it's a dominant feature and colour that should match the story and style that you want your house to convey.
- ➢ Whether you want to use the space under the roof for an attic.

- ➢ The loading on the roof. The roof must be designed to withstand weather events such as rain, snow and winds, as well as the loading inside, which includes the weight of the ceiling, chandeliers and any equipment such as air-conditioning systems and hot water systems suspended from the roof, and also where an attic is included and supported from the roof then the weight of the attic structure and contents.
- ➢ The interior design of the house which could require raked or vaulted ceilings which follows the pitched profile of the roof.
- ➢ Your budget.

Roofs must be securely tied down to the structure below so that it can't be ripped off in severe winds. Roofs in areas subject to cyclones, hurricane, typhoons and tornedos should be specially designed to withstand these storms.

The structure of the roof can be constructed of rough timber poles, sawn timbers forming trusses, laminated timber beams to span large widths, steel trusses (made of angles, pipes, channels or hollow sections), steel beams or solid concrete.

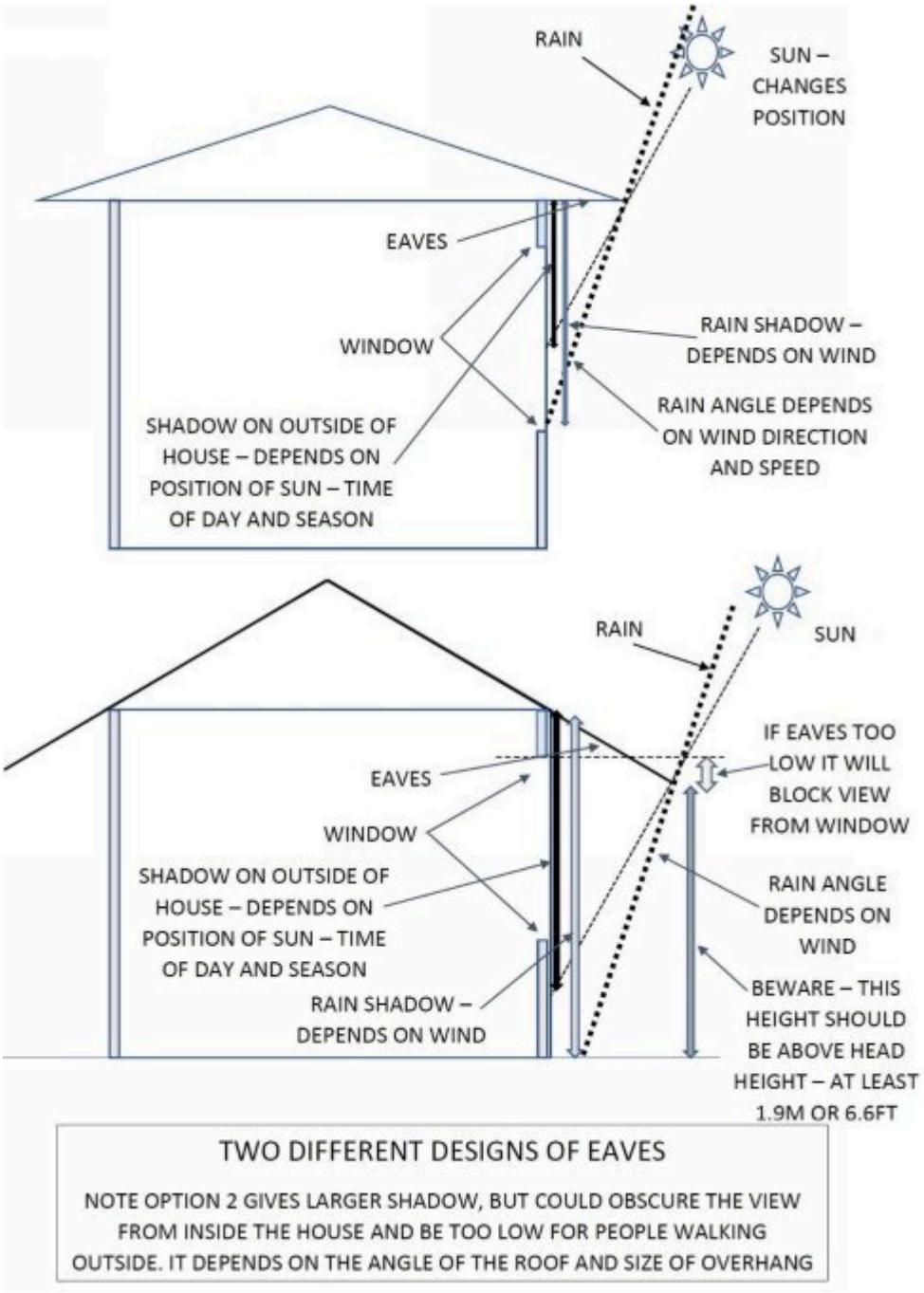
Roof eaves – why they're worth having

Roofs are frequently constructed with an overhang beyond the face of the exterior walls creating eaves. Many owners these days elect to have the roof stop at the outside of the exterior walls, or to have only a small overhang. This is often done because:

- ➢ The overall roof has a smaller area and its therefore cheaper.
- ➢ It suites the architectural style of the house.
- ➢ The house has to be set away from the boundary of the property by a specified distance (according to local authority or estate rules). Roofs (including eaves and gutters) cannot encroach over neighbouring property, nor can rainwater on the roof fall into your neighbour's property. In fact, in some cases the building line, or distance from the property boundary, is determined to the edge of the roof and not to the walls of the house.
- ➢ It allows more light into the house. Eaves restrict the amount of light striking windows.
- ➢ With steeply pitched roofs the exterior walls may have to be higher to take into account that the lower end of the eaves must be above the head height of people walking outside the house.

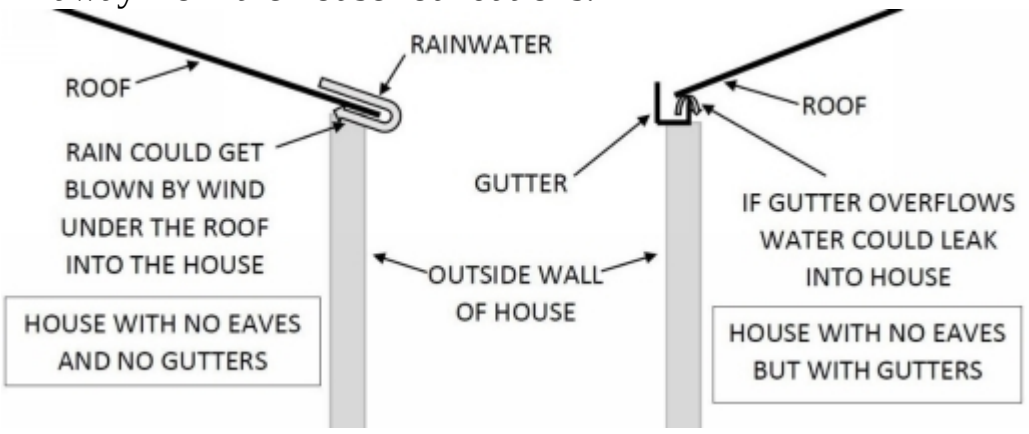
However, there’re advantages to having the roof overhang the walls.

- ➢ In hot climates it helps shade the external walls and windows of the house.
- ➢ It shelters the walls and windows from the worst of the rain, lessening the likelihood of them leaking. Windows can often even be left open even when it’s raining (unless the rain is accompanied by strong winds).
- ➢ Often with a strong wind, water flowing off the edge of the roof can be blown up the underside of the roofing material (particularly tin and aluminium sheeting). If the roof ends at the exterior walls of the house then some of this water could be blown into the roof space and cause damage to the house. With eaves there’s minimal chance that the water could be blown so far back along the underside of the eaves.



- Eaves can be architecturally pleasing for many styles of houses.
- Where there are rainwater gutters around the edge of the roof these gutters aren't immediately above the external walls. This means that should the gutters or downpipes become blocked, then the overflowing water will safely spill away from the house. When gutters are over the edge of the house it's likely that overflowing water could get into the house, damaging walls and ceilings.

➢ If there are no gutters on the roof it keeps water running off the roof away from the house foundations.



Roof gutters, or not?

Gutters collect and channel the rainwater running off the roof. Without gutters the water falls off the roof in a curtain which can obscure views, soak you and visitors as you dash for the front door, and erode away the soil where the water falls on the ground. Invariably when the water hits the ground it splashes against the outside of the house dirtying it. Roofs without eaves result in water from the roof running down the walls and windows, possibly finding places to leak into the house. Water collecting around building foundations isn't a good idea and could cause foundations to sink. Of course, if the area around the house is concrete paved and is sloped to keep the water away from the house then some of these problems can be eliminated.

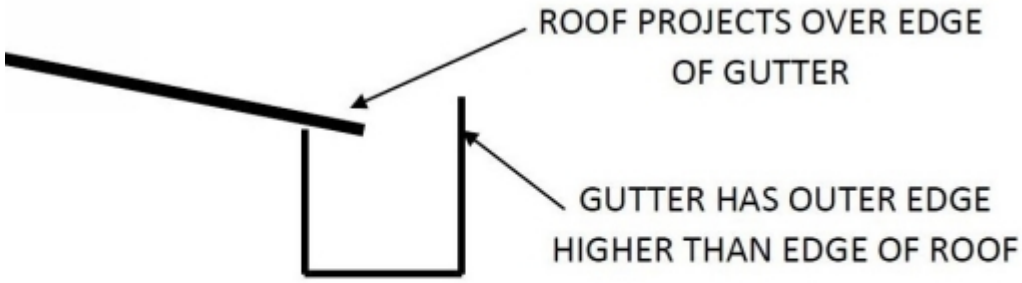
A major benefit of gutters is that they can collect and channel rainwater to rainwater tanks where it's stored for later use in the garden, or in some cases even in the house.

Gutters do have problems which include that they might not be suitable for all styles of houses. They can be clogged with leaves and fruit from nearby trees causing them to overflow, the leaves accelerate rusting of steel gutters when they rot inside the gutters and downpipes, and dried leaves in gutters are also a fire hazard, so gutters should be regularly cleaned. Gutters can also be blocked with ice, snow or hail, causing the gutter to overflow.

It's possible to hide gutters in the design of the roof.

Gutters come in various materials including PVC, aluminium, copper, coated tin and zinc. They can be square, round or have other profiles and come in various sizes. Selecting the right size will depend on the intensity

and the duration of rain in your location. Gutters should be wide enough and have the outside edge slightly higher than the inside edge to prevent the rainwater flowing off the roof from simply jumping straight over the gutter onto the ground below.



GUTTER DETAIL

Gutters can be ordered in various colours to match your roof colour, or they may have to be painted – which is a maintenance job.

Rain from the gutters is usually channelled to downpipes which lead the water down to the ground. It's important to ensure that the downpipes are also correctly sized for the rain conditions and that they're placed at regular intervals to manage the flow of water. Alternatively, vertical chains can be fixed to the end of spouts to direct the water in a controlled manner to a receiving area on the ground, often an urn or a bed of stones. The gutters must slope towards the downpipes or water outlets with no low spots so that the water flows out the gutters leaving no standing pools.

Gutter guards can be fitted over the top of gutters to prevent leaves, snow and hail from entering and blocking the gutter.

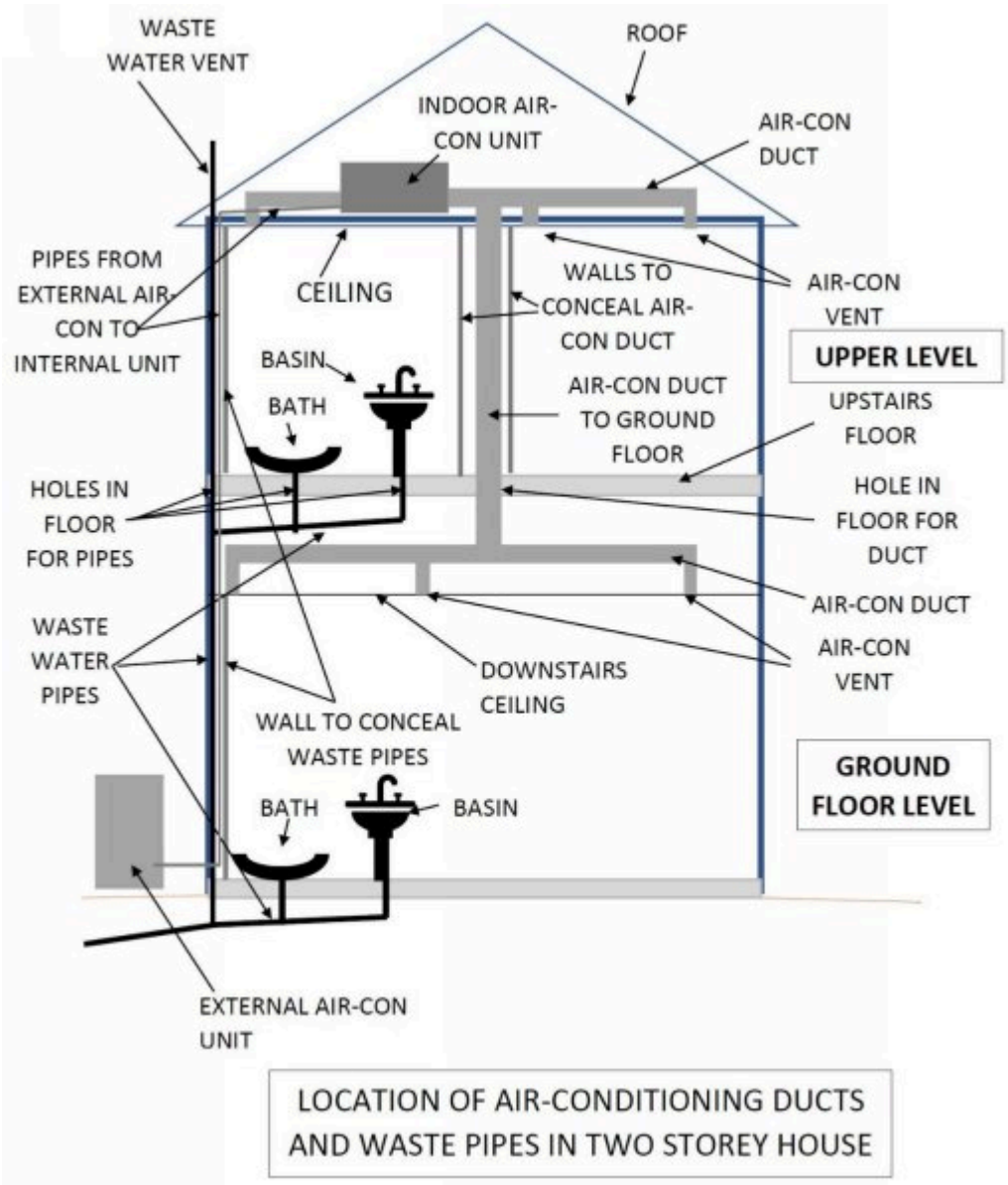
Location of pipes, cables and ducts – hiding them

Once you've decided the internal layout of the rooms and what you need in your house, then you must ensure that water pipes, sewer pipes, gas lines, electrical cables, ducts for data and televisions cables and air-conditioning ducts can all get to where they're needed, without them being visible or unsightly. This means correctly sizing the various items and knowing what they'll be connecting to.

- Houses usually require a main internal electrical switchboard large enough for all of the circuit breakers. This requires a large conduit with a long radius bend to accommodate the main incoming

electrical cable. From this board electrical cables must be able to get to all parts of the house.

- Sewer pipes connect to floor drains, showers, bathtubs and washbasins. Many of these must be accurately positioned in the floor while the floor is being constructed. They have to be connected together and lead to one main pipe that connects to the town sewer or a septic tank.
- Air-conditioning systems often require internal units connected to external units. A suitable route for the pipes and cables must be planned so that these aren’t visible inside. Split units must be fixed to a wall where the air-flow can be best directed. Ducted systems require ceiling void spaces for the internal unit and this space must be accessible so the unit can be serviced.



LOCATION OF AIR-CONDITIONING DUCTS AND WASTE PIPES IN TWO STOREY HOUSE

➢ Multistorey houses present their own set of problems. Sewer pipes and air-conditioning ducts must penetrate the elevated floor slab, so this should be designed to have the correct size openings through the floor. In addition, there should be sufficient ceiling void space in the lower levels to accommodate air-conditioning ducts, as well as the sewer pipes from the drains above. Sometimes the ceiling voids must be accessible for maintenance. The layout in the floor above must allow space within some walls for the air-conditioning ducts to pass from the upper level ceiling void down to the ceiling void of the level below.

- ➢ Many estate rules preclude drain and water pipes being fixed to the exterior of the house, and anyway it looks untidy and spoils the look of the house. It's far better to include space, or ducts, within the walls to accommodate these pipes so they're hidden from view.
- ➢ Gas and water pipes should have shut-off valves that can be easily located and accessed.
- ➢ Fans in bathrooms and cook top extractor fans either require a duct or pipe to penetrate an external wall, or they must pass through the roof. These must take account of the position and height of windows as well as the ceiling heights.
- ➢ Sewer pipes often require vent pipes and these usually have to penetrate the roof.
- ➢ The location of light fittings, ceiling fans and air-conditioning grilles in the ceiling must be such that they are effective, but also so that they don't clash, while also being visually pleasing (usually preferably symmetrical about the centre of the room and in a regular pattern).
- ➢ The hot water system must be installed in a suitable place. Usually gas systems should be outside. Electrical hot water systems vary and those with a tank require space so may be installed in a ceiling void, or if there isn't sufficient space then somewhere inside the house, usually in a cupboard. They require a water pipe feeding the heater and then pipes taking the hot water to the various baths, showers, sinks and basins.
- ➢ Automatic irrigation systems for the garden require place for the controller which needs power and water supply and outlet pipes feeding the irrigation.

Therefore, before the final architectural and engineering construction drawings are completed, it's important that air-conditioning details are resolved, the sewer and water systems are designed and the electrical layout is completed so that everything is allowed for and accommodated.

Finishes – what everyone sees

Finishes are generally classed as the parts of the building we see. So they include:

- ➢ Roof coverings, including the colour and material.

- Floor coverings, which could be, tiles, timber (solid or laminates), carpets, vinyl flooring, and exposed concrete.
- Wall finishes, which could include timber panelling, wallpaper, plaster (render), including textured plaster, tiles, paint, stone, and other coverings.
- Ceilings which could be plain flat, have recesses or bulkheads, be pressed metal, have drop-in textured boards, wood panelled, etc.
- Light fixtures.
- Plumbing fixtures such as bathtubs, basins, taps, etc.

The choice of the building finishes could be impacted by:

- The durability of the product. How long it will last. This often also depends on how much it's used. Carpets in bedrooms may not get as much traffic as say stairs and living areas.
- Your budget.
- The style of the house and intended décor.
- How easily they can be cleaned. For instance, rough textured coatings to walls can collect dust and be more difficult to clean.
- Their suitability for their intended location, including the suitability to the local climate.
- Fashion. What's in this year may not be the fashion in a couple of years' time.
- The structure of the house and how easily the item will bond to the structure. Some finishes may be heavy and difficult to fix.
- The thickness of the material. This is particularly a concern with floors where you don't want steps at the transitions between the different floor finishes, say going from a carpeted area to solid timber floors.
- Other materials being used. Some materials can look great in another house, but when combined with other materials and finishes in your house they may not be so good. Materials shouldn't be considered in isolation, but looked at considering all the other fixtures and fittings.
- The time available to install the product. Carpets are quick to lay while floor tiles require more time to install.
- The weight of the material. For example, timber panelling on the ceiling is heavier than normal ceiling boards and may require a

stronger roof structure.

- ➢ Availability of the materials, as well as tradespeople to fit them.
- ➢ The condition of the substrate surface. For instance, some flooring materials require a very dry concrete surface to stick to, while others require a super flat surface. So for instance, if you're doing renovations to an existing house then laying a carpet over the existing flooring could be easier than say vinyl which will show all the bumps and blemishes in the existing concrete below unless the floor is made smooth first (at additional cost).
- ➢ Climate. In hotter climates tiled floors help cool the house, but tiled floors can be cold in winter.
- ➢ Pets. Tiled floors are easier to clean than carpets. They're stain resistant.
- ➢ The size of the rooms. Dark colours make small spaces appear smaller. Light colours reflect light making rooms appear larger. Large tiles are probably unsuitable for small rooms, making them appear smaller. Busy patterns are also unsuitable for smaller spaces.

The finishes are what everyone sees. They need to fit your lifestyle, reflect your style, not appear cheap or be overstated and extravagant, while also not breaking the bank. Some finishes can be easily changed, such as paint and carpets, while floor and wall tiles and wood flooring can be messy and expensive to alter.

The type of finish should be chosen before the design is finalised, although colour choices can usually be decided as construction progresses.

Maintenance – making your life easier

It's important to consider future maintenance since not only could this be costly, but it can be inconvenient and cause disruption.

Maintenance includes:

- ➢ Painting. Cheaper paints will require painting more often. Metalwork near the ocean will rust unless it's corrosive resistant or regularly painted. Some timber products and finishes require regular upkeep, especially when exposed to harsh sun and rain.
- ➢ Servicing and cleaning air-conditioning units.
- ➢ From time to time light bulbs fail and need replacing. Most of us don't want to call an electrician for this but rather do it ourselves. Unfortunately some fittings are difficult to loosen. Lights over

stairs or double volume areas could be difficult and dangerous to get to.

- ➢ Access to television antennae and satellite dishes. From time to time antennae and dishes can be damaged or shift out of alignment. If these are in an accessible place they're more easily repaired. When repairmen require specialised equipment to reach them it adds to the cost. So steeply pitched rooves can be difficult and dangerous to work on. Always consider adding permanent safety tie-downs on the roof so that workmen can hook themselves on when they work on the roof.
- ➢ Cleaning blocked pipes. Regrettably sewer pipes often get blocked with hair, fat, food and other debris. Plumbers usually require access into the pipes to clear the blockages. It's good practice to incorporate access hatches/covers at regular intervals and at bends where blockages are likely to occur.

Often it's necessary to access the roof space, especially if there are hot water and air-conditioning units in the roof space. A hatch should be provided through the ceiling. This hatch must be easily accessible from inside the house, preferably not over beds or large furniture which have to be moved to gain access. The hatch should provide easy access into the roof space, so it should be where the roof space is the highest. Consider constructing timber walkways from the hatch to where equipment is installed to allow for more easy servicing.

Pets – an important part of many families

Most people have pets such as dogs, cats, birds, or more exotic or larger animals. Important considerations for pets include:

- ➢ If dogs and cats are allowed inside you'll want a floor finish that's easy to clean and disinfect, such as tiles or hard wood. Porous floor finishes such as marble tiles could be stained when animals mess inside. Dogs often lie against walls and rub along walls. You should choose wall paint that's hard wearing and can be easily cleaned, and possibly colours that don't show the dirt as quickly as white might. You may want to separate portions of the house to prevent your dog going into bedrooms. You could include a cat or dog door in an external door so that pets can come and go as they want.

- ➢ The garden should be big enough for your pet, unless you have a park nearby and you're happy to walk your dogs a couple of times a day.
- ➢ If your dog stays outside, plan where you'll place the kennel so it's shaded from the sun and sheltered from driving rain.
- ➢ To keep dogs outside you could install screen doors so doors can be open for the breeze while Fido is outside. Stable doors can also be the answer, where the bottom half of the door is latched and the top half left open.
- ➢ If you're planning to install a chicken coop or aviary, plan your garden to allow space for it, noting that there may be local regulations as to how close these structures can be to your neighbours. You may enjoy the sound of birdsong and chickens crowing, but neighbours will object if the birds are located right next to their bedrooms or outside their entertaining areas.
- ➢ Fences and gates must be high enough and robust to keep your dogs in. You may consider placing the fence such that you can enter the driveway and garage and not have to worry about the dog rushing out into the road.

The last words are for the children

Family and children are important, so your house and garden needs to take account of your family's changing needs and requirements as the children grow up. Happy children create a happy life and a happy home.

For young children it's vital that your house is safe, that they can't accidently drown, run into the street, fall out windows, open cupboards and drawers, or pull heavy objects over. They need a place to play where they can be seen, a place to have fun, and they need place for all the toys and the other paraphernalia of young kids. Inevitably there will be mess, so floor and wall finishes need to be easily cleanable.

As children become older they want some privacy, a place to call their own, a place to study, and a place for hobbies and friends.

In all of this you'll also want somewhere to escape the noise and an area that you can call your own.

Eventually children grow up and require space to park their cars. They'll be coming and going at all hours of the day and night.

But even the number of bathrooms and their design is impacted by children. Small children require bathtubs, while teenagers can occupy

bathrooms for long periods (normally at times when you are rushing for work) then leave them in a mess.

Then, children leave home and it's back to two of you. But, not for long, since frequently the family grows again, with visits from your children, their partners and their children. Your home becomes a place for an extended family.

How will your house cope with these changes? Do you see a place for everyone? Do you see that quiet retreat for yourself where you can escape the noise and sometimes chaos? Will your house be a happy home for everyone?

The efficient use of space

Have you used space efficiently? Irregular shaped rooms can leave portions of the room difficult to use. Long passageways waste space. Areas under stairs can be used for storage, even sometimes for an extra toilet. Can an unused space be converted into an extra cupboard? Can you make better use of space by moving doors, relocating windows, even lifting the bottom of windows or making them slightly smaller. Moving an internal wall slightly could make a big difference to one room while only having a minor impact to the room that lost space. Does the roof extend beyond the outside walls in places which could be converted into an external store. Could the space in the roof void be converted into an attic for extra storage?

Of course, even a small change could have a knock-on effect on the electrical, services and structural integrity of the house, so always make sure you consider all implications of the change.

Access during construction

When designing your house it's important to consider the available access.

- Will delivery trucks reach the property? If the surrounding roads are narrow, they haven't been designed to take heavy loads, there are low overhead bridges or powerlines, the gradients of the roads or your driveway are excessively steep, or the roads become impassable in wet weather then it could impact the size of components and construction methods.
- Is their place to store materials?
- Is there place for cranes to be set up if required?
- Are there overhead restrictions on the property which could interfere with cranes and other construction equipment?

- ➢ Houses set well back from the road could make it difficult to get materials to where they're needed. Trees, gates and garden walls could restrict access to the property.
- ➢ Are there estate rules which could limit the size of vehicles accessing the property, or prevent the use of some equipment or construction methods?

So, it might be pointless designing a house in modular form or with large components if they can't get to where they're needed. If a crane can't be set up on the property then avoid incorporating heavy or large components that require a crane. But sometimes small congested properties might suit module construction, where most of the work can be done off site, then the completed modules can be delivered and dropped into place with minimal disruption to the neighbours.

Constructability – how easily can my house be built?

How easily can your house be built? Constructability of your house will depend on:

- ➢ If you're doing most of the construction work yourself, then the house should be easily constructed by you. A house that requires complex construction processes, or skills which you don't possess, might not be constructible for you.
- ➢ The methods that local contractors are familiar with. A house design or construction materials used commonly elsewhere might not be familiar for the local contractors, so it may take longer and cost extra money.
- ➢ The complexity of the design. Having extra-large windows, cantilevers, houses hanging over the edge of cliffs, curved shapes, complex roofs and intricately detailed finishes adds to the difficulty of constructing the house.
- ➢ The actual site. Small, narrow, crowded or steeply sloping properties provide construction challenges to set-up cranes, to place materials and to excavate deep foundations.
- ➢ If your house is on the boundary with your neighbour consider how you'll be able to access the work areas on the boundary. Your neighbour won't want you building a scaffold in their property to access your wall, especially if their pool, or much loved rose garden is right where your scaffold needs to be. They also wouldn't want you walking on their roof. Your neighbour certainly

doesn’t want building rubble, including cement mortar, falling into their property, on their garden, in their pool, or where they could be walking. It’s important to consider how you’ll construct the walls and roof that are right on the boundary.

- ➢ Access to the site as discussed previously. Consider if it’s possible for that module, premade pool, prefabricated wall or floor, large window or roof section to get to the site.

Having a house that’s difficult to construct will make it more expensive and invariably add to the construction duration. In some cases it might even cause quality problems when difficult work isn’t done properly.

Module construction – a quick build or a headache

Sometimes it’s possible to construct portions, or even the complete house as a module which can then be delivered and quickly assembled on the site. This is particularly useful when adding second floor additions to an existing house. Modules are usually fabricated in factory conditions where quality can be better controlled and where weather won’t impact construction.

Obviously the modules have to be designed such that they can be easily transported, lifted into place, assembled and completed. These sizes will be dictated by the access roads to the project site (bridges and overhead power lines could limit their height), access around the site to position cranes, the availability of cranes (it’s pointless building a module that’s too big to be lifted by cranes available locally meaning that a larger crane has to be mobilised from elsewhere at enormous costs), the available transport vehicles and the local road regulations which could limit the size of loads.

The modules have to be designed to include suitable lifting points and take account of how they’ll be fixed to the foundations, how they’ll join together and how they can be made watertight. The modules need to be made of lightweight materials so they can easily be lifted. The modules have to be rigid so they don’t distort while being lifted, which could damage fittings and fixtures.

Using modules may make it difficult to change the house later, for instance move walls or make windows bigger.

Value Engineering – can you do better?

Don’t be put off by the words engineering or value. Value engineering is the term given to check if there’s a smarter way of doing things, a way that may be cheaper, safer or quicker. It’s not necessarily about using

cheaper equipment and materials. In fact sometimes, using more expensive materials could reduce construction times or require less maintenance, thus making the overall house cheaper. Value engineering is about analysing the house design to see what changes can be made to reduce the overall costs or reduce the construction time. Value engineering includes improving the aesthetics and the quality. It's about considering alternative solutions.

Value engineering looks at layouts, products and materials. Standardising items can reduce costs.

Always ask your designer: "Is there a better way of doing this?" "Is there a cheaper way?" Simply asking these questions stimulates further thoughts and discussions which may result in a better and more optimal solution. Of course it always pays to carefully weigh up the alternatives because the cheaper option might not result in the home you're looking for. You also don't want a house that looks cheap, or is of poor quality!

Value engineering should be done before the final design is complete and construction drawings are done. It should be noted that late changes to the design could cause delays and additional costs which are more than the savings from the proposed changes.

Get the details right – missing details cause big headaches

It's one thing having the right rooms, perfect, with good fixtures and fittings, but, having the wrong details could make or break the house. Incorrect details could mean that the windows, walls or roof leak. Poor details can make a house look unfinished. A missing detail could delay your contractor because they have to stop work to ask what the detail should be. Good architects and designers understand the details. Many details are standard and work for standard buildings. Some details have to be adapted to suit your house.

Details could include:

- Details around doors. Door frames must be securely built-in so they don't shake loose when the door is slammed. The frames must be fitted straight and plumb. The frame can have architraves (decorative detail) fitted around the opening which makes the frame look more finished, possibly even luxurious or 'upmarket'.
- Door thresholds. (How the door sits in the floor.) You don't want rain entering the house, but you also don't want to be tripping over a raised bar.

- Details around the windows. Poorly detailed and fitted windows could result in rain leaking around the window.
- Windowsills should slope outwards so that water doesn't collect against the window and penetrate the wall.
- The size and thickness of window frames depends on the materials used. Frames must be sturdy enough so they don't deform and can withstand the pressure of strong winds. They must be designed to have opening sections where required, and such that opening a window doesn't cause the window to bend and flex. It must be sized so the glass is held securely, ensuring that water can't penetrate around the glass. But the frame mustn't be too big, where it obscures views, looks chunky or doesn't provide the desired architectural style and impact.
- Flashing around where the roof and chimney meets so rainwater doesn't leak into the house.
- Finishing the edges of roofs, including fixing barge boards and gutters.
- The size and shape of skirtings. These finish-off the connection between the floor and the walls, as well as adding to the architectural style of the house.
- The size and shape of cornices which finish-off the connection between ceilings and walls and also add to the architectural style. How will these cornices tie-in to cupboards that reach the ceiling, and how will they be impacted by windows and doors which are ceiling height? What's the cornice detail around bulkheads and ceilings that have different levels?
- The correct location and detail of waterproofing membranes and dampproof courses in walls and under floors. Incorrectly positioning these membranes could make them worthless.
- Providing steps in floor slabs to accommodate waterproofing and different thicknesses of floor finishes.
- Connections between the roof and the walls, including sealing of the gap between the walls and the underside of the roof.
- Foundations.
- Connection between the walls and the foundations.
- Types and locations of insulation materials.

- ➢ Transitions, or meeting points, between different floor finishes, such as between floor tiles and carpets or wood floors.
- ➢ Details of fixing handrails, especially where there's water proofing involved.
- ➢ Details for the sides and edges of stairs.
- ➢ Details of the roof, including locations, sizes and spacing of purlins to support and fix the roof coverings.
- ➢ Chimneys and fireplaces usually require specific details for the fire box, flue, hearth and the fireplace surrounds.
- ➢ Fixings of exterior cladding.
- ➢ Architectural features on the exterior of the house.
- ➢ Details for finishing tiles on steps and where tiles wrap around corners.
- ➢ Details under the eaves where the roof overhangs external walls.
- ➢ Details where ceilings meet skylights.

These details are often shown as an enlarged section on the construction drawings.

There are also several good architectural books which show various details.

Consistent architectural design and vision

In chapter 1 we discussed style. It may be pertinent to review that section before the design of your house is complete. It's important that before the end of the design process you review the style of the house to see that it's consistent, that everything tells the same story, that nothing looks out of place. Check if the style matches what you originally had in mind and if it doesn't understand why it's changed and know that you're happy with the changes.

Reviewing the style for the average person can be difficult since all you're looking at are some drawings. A competent architect or draftsperson should have prepared elevations of the house, which are the external views from different sides. Preferably these should be coloured. Much of the interior will depend on your choices of finishes, fixtures, fittings, colours, cabinetry and furniture. But it's important that the layout and spaces are correct, that you've chosen the right windows and doors, and that the ceiling heights are sufficient. Always ask your architect questions and

understand how to hold the style together, ensuring there are no style clashes.

Is this really what you want?

Designing a home presents many alternatives and the end design is often shaped by restrictions and budgets and influenced by others' opinions. Inevitably you grab at whims and fancies. What you might end up with is a design that you never originally envisaged – which might be a good thing! But, it's good practice to step back and take a long thorough look at the design, considering what your original wants and needs were, and check that the design fulfils these, and of course those of your family. Where it doesn't, then it's important to understand why it doesn't, which could be because it was impossible to satisfy some of them, or because in developing the design you found that some of the wants and needs were no longer an imperative. Possibly the design brought better and more innovative solutions. But, maybe in the excitement of the design process you lost sight of what was important to you and your family. All too often people end up with a final design which actually doesn't satisfy the reason for originally embarking on the project. Regrettably, they sometimes only find this out after completing construction.

Colours – putting it all together

Selecting paint colours is something that can often be done when the building is almost complete. However, colours are more than just about paint. Some colours have to be decided near the start of construction. Colours that may have to be considered include:

- ➢ Roof covering materials.
- ➢ Exterior walls.
- ➢ Interior walls.
- ➢ Door and window frames. Even aluminium frames come in various colours and timber comes in a variety of hues.
- ➢ Floor and wall tiles.
- ➢ Bathroom fixtures, such as bathtubs, basins and toilets.
- ➢ Tapware.
- ➢ Counter tops in kitchens, laundries and bathrooms.
- ➢ Cabinetry in kitchens and bedrooms.
- ➢ Carpets.
- ➢ Fences and garden walls.

- ➢ Swimming pools.
- ➢ Gutters and downpipes.
- ➢ Balustrading and handrails.
- ➢ External paving and driveways.
- ➢ Furniture.
- ➢ Window coverings, including blinds, curtains and shutters.

Colours can dictate the mood and style of a room or house. Light colours help brighten rooms, even making them appear larger. Dark colours make rooms appear dark and smaller. Touches of bright colours can lift a room, making it cheerful.

Colours appear different when combined with other colours and when seen in different lighting. Some lights can make whites appear yellow, while other lights make whites appear grey. Even colours on exterior walls absorb and reflect the colours of their surroundings.

> *Case Study: We were considering colours for an apartment complex and found that some colours we painted on the walls appeared pinker than the samples we had seen painted elsewhere. We eventually concluded this was because the neighbouring buildings were constructed of red bricks and the brick colour was giving our paint a pinkish hue.*

Always view all the colour elements together using large samples. If necessary spend money to purchase a larger sample. Paint areas at least a metre square (ten square feet). Remember it’s important to get samples of the actual paint that will be used, since using a paint from a different manufacturer may provide a different hue and tint, even when the colour formula is identical.

Some colours may work well in one house, but don’t work in another. Not only does the style of the house impact the suitability of colours, but the amount of light entering the rooms, the outside views, and even the room arrangement can all impact your colour choices. So, those floorboards or carpets that you really like might not actually be suitable for your new house. Know what you like, but be prepared to be flexible so that you select the most appropriate colours for your house.

There’re some apps which allow you to take a photograph of a room, or the exterior of the house, then you can apply various colours. Although again, the actual colours in real life may appear different to those viewed on the screen.

Drawings

Designers (engineers and architects) convey information graphically to the owner, contractors, suppliers and the authorities. Drawing are a schematic representation of the building and the components that make up the final structures.

There are various types of drawings which include:

- ➢ Schematics, or sketches, to provide a basic concept of the house and to formulate and develop ideas.
- ➢ ‘For information’ drawings, which are more detailed but aren’t yet approved for construction. ‘For information’ drawings could also include drawings of similar houses or details used on another house.
- ➢ General layout drawings which show the relationships between the different structures making up the project. This would include the site plan which could reference existing services and utilities and the boundary pegs, as well as the location of the site relative to the neighbours and the road.
- ➢ Construction drawings which accurately depict what must be constructed.
- ➢ Shop drawings which are usually prepared by suppliers and contractors and depict the detail of the fabrication process.
- ➢ Drawings of the existing structures, where these are required when new structures have to tie into the existing facilities, or when the existing structures have to be modified as part of the project.
- ➢ Topographical drawings which show the ground shape and level (usually with contour lines), and where required, existing trees and utility lines.
- ➢ ‘As built’, or record drawings, which show the final constructed house and are updated to reflect what was actually constructed. These are usually produced by the contractor when they’ve finished constructing their portion of the project.

As the design is developed and refined the drawings become more detailed. Only once you (the owner) has approved the basic design and details will designers complete the detail construction drawings.

Drawings include plans (a view from above), sections (which are slices through the house – the position of the slice should be shown on the plan drawings and each slice has a number and an arrow showing which

direction the slice is looking), elevations (the outside view of the house – different elevations show different sides of the house), 3D views, detail views (show portions of the project in detail - often shown at a larger scale) and schedules (which are tables containing, for instance, plumbing fixtures, various building finishes, types of doors and the window details).

Sometimes, it's possible to have plan views, sections, elevations and details on one drawing. However, too much information on one drawing makes it difficult to read and interpret.

Drawings could be:

- ➢ Architectural, which include floor plans, sections, elevations, roof plans, ceiling plans, tile layouts, door schedules, fixtures and fittings, and windows.
- ➢ Structural, which include the detail of concrete and structural steel elements that form the structure. These could include reinforcing steel details.
- ➢ Electrical, showing positions of electrical switches, lights and electrical boards.
- ➢ Civil, showing roads, stormwater pipes and site drainage.
- ➢ Mechanical, showing air-conditioning ducting and types and positions of equipment.
- ➢ Plumbing, showing the arrangement of pipes. Sometimes these don't accurately position the pipes but are schematic, only showing pipe sizes and how the pipes connect together. The plumber is expected to fit the pipes according to the actual placement of walls and floors.
- ➢ Landscape drawings which schematically represent the garden and the types of plant and trees. These could have some dimensions, but are often only a general representation of the proposed garden layout.

It's important that these drawings all relate to each other and that they are coordinated and don't contain conflicting information.

Drawings should:

- ➢ Have a unique number which references the project. This number would include the revision number (each time a drawing is changed or updated it's allocated a new revision number, but always maintains the original drawing number, for example, drawing number A0215 rev 0, A0215 rev 1, etc).

➢ Have a title block, which includes the project name and the title of the drawing. (Example; House Netscher – 2 Allora Ave, Subiaco, Ground Floor Plan – Architectural.)

➢ Include references to drawings which must be read in conjunction with the drawing. (Example; Refer structural details, drawings C0015 and C0016)

➢ Show the dates when it was prepared, when it was approved, as well as all the dates it was revised.

➢ When they are construction drawings:

- Be to scale with the scale indicated on the drawing.
- Have sufficient setting-out information to locate the structure on the site. This often includes a north point.
- Have enough dimensions so the item can be constructed.
- Have adequate information to locate the structure in the vertical plane.
- Provide sufficient information, or refer to specifications, so that the types of materials (and where necessary their strength) are clearly indicated.
- Should have sufficient detail and information so the contractor has no doubt what to build and they shouldn't have to assume or make up their own details. Missing information will result in delays with the construction and even mistakes.

Drawings usually contain standard symbols which are universally used to denote particular items. It's good practice to include a list of these symbols with the drawings.

Sometimes there are areas or items on a drawing where there's insufficient information, or where the designer is unsure of what's required. In these situations designers mark the areas 'on hold' which indicates that the information on that section is incomplete and cannot be used for construction. Once the design of that area is finalised the 'hold' can be removed and a new revision of the drawing is issued.

After a drawing has been issued for construction it may be necessary to change information on the drawing, because new facts have come to light or because the designer or owner has decided to make changes. These changes are made to the drawing which is then given a new revision

number and it’s issued to the relevant parties. It’s good practice for designers to ‘cloud’, or highlight, the changes on the drawing. In addition a schedule of the changes should be shown on the drawing so it’s easy to see what’s been revised or changed.

Always check that the drawings have been issued ‘for construction’. Often drawings have only been issued for information purposes, which might mean that they aren’t complete, or that they haven’t been approved yet.

Models – a visual representation of your house

3-dimensional computer models can usually be easily reproduced from electronic drawing systems. These more simply demonstrate what the finished house will look like and how the various rooms fit together. It’s difficult for many people to visualise a project from drawings and they grasp the project better by viewing a 3-dimensional model. Many suppliers can easily show rooms and fixtures in 3-D.

With the latest virtual reality technology it’s possible for designers to ‘walk’ you through a graphical representation of the structure before it’s built. You can view the project from the outside and ‘walk’ through each room. It’s possible to review different fixtures, furniture and colours and experience the project as if you were already living there. There are also software and apps which can be purchased which do this.

Summary

You owe it to yourself to design a house that you’ll be proud of, one that will adapt to your changing needs and one that won’t unduly stress you financially. You owe it to your family to design a house that’ll be functional and practical, one that will provide them safety and comfort. You owe it to your neighbours to design a house that won’t negatively impact the value of their properties, a house that will fit into the neighbourhood. You owe it to future owners to design a house that will be a quality product. You owe it to the World to design a house that will make the best use of resources, that’ll have a light footprint on the World. Get the design right and you can simplify the construction process. A good design will provide you and your family with years of comfortable and happy living.

I may have confused you with all the items outlined above. It can almost seem a daunting task. But a good designer will naturally sort many of these items for you. Some items I’ve discussed might not be important for you, so you can cross them out. Some will be very important and you

may want to arrange these at the very top of your list of priorities, while many items can serve as a checklist so you can tick them off as the design progresses, and then again at the end, to ensure that nothing has been forgotten.

The process could start with some ideas, maybe plans that you like, then progress through sketches and changes to refine the design. Decide on room sizes – resist overly large rooms or those that are too small. Firm up the layout and the external views. Then get to the details of window sizes and locations, door positions, room heights. Decide on the finishes and fittings, then finally complete the detail design.

A checklist of items you should consider when designing your house:

- Have you got a survey plan of the property showing the boundaries, road, existing ground levels, existing features and the connection points for utilities?
- What restrictions and rules must the design comply with?
- Do you plan to use existing plans and modify them to suit your requirements, or do you want a custom house designed especially for you?
- How will you make your house environmentally friendly and sustainable?
- How many rooms? What are the functions of each room?
- What's the preferred size of the rooms?
- Single storey, double or three floors?
- The arrangement of the rooms. What goes where.
- The ceiling heights.
- The floor elevations (heights). Will the ground floor be one constant level?
- The type, size and positions of windows.
- Will there be enough light or do you need a skylight? A skylight can also be a feature.
- The location and the design of stairs and balustrades.
- Where do you want doors, what type of doors and doorframes and which way should they open?
- The type of entrance porch and entrance foyer or lobby.
- Do you need a home office?

- Consider the layout of your kitchen for convenience and practicality.
- Get your bathrooms right. What goes where? How big?
- Do you require a laundry?
- The size and location of garages if these are required.
- How will vehicles access the property and where will they park?
- Do you want a balcony?
- Is a basement a requirement?
- Will your home be adaptable to you and your family's changing needs?
- What will the house look like from the outside?
- What are the building materials?
- Check that the design is within budget.
- Will others appreciate the house – especially future buyers.
- Ensure the safety of you and your family.
- What security measures are required?
- Have you checked privacy?
- Have you allowed for the changing seasons and the weather conditions?
- Should you consider mobility restrictions, now or in the future?
- Is the house suitable for your pets?
- Have you considered your hobbies?
- Is there sufficient storage?
- What technology do you want included?
- Consider the number and the location of electrical sockets.
- What communication outlets are required?
- Is there sufficient lights and are they located to provide light where it's required. Where will the light switches be located?
- How will you heat and cool the house?
- How will you get hot water?
- What type of roof will you have and will this suit the architectural style of the house and the available materials? Will the roof have eaves or gutters?
- What finishes do you want? Has the design taken into account the finishes?
- Will the house be easy to maintain?

- ➢ Have you considered the location of all the pipes, cables and air-conditioning ducts so that they’re hidden?
- ➢ How easily will it be to construct the house?
- ➢ Is the design the best you can do? Can it be refined or improved?
- ➢ Is the architectural style consistent?
- ➢ Are all the details clear and been thought through, so that those doing the construction work get it right?
- ➢ Is this really what you want?

It’s important to get the design right, but also to design a home that fits your budget. Select a designer that has worked on similar projects to what you have in mind, and a designer that you can work with. Ensure they understand your requirements and budget as well as the property restrictions. Continuously communicate and work with the designer, providing feedback on their ideas, concepts, sketches and drawings. Be willing to accept advice but don’t be pushed in a direction or to make choices you aren’t happy with.

You might not have the budget for everything you want now, but ensure that the design gets the basics right, the things that will be difficult and expensive to change later. The design should take account of changes and modifications that you would like to embark on in the future when your budget allows.

If your chosen design is going to exceed your budget you will have to consider alternatives, such as finding additional finance, building the project in stages, selecting cheaper finishes or saving costs elsewhere.

Chapter 5 – Designing the Outside Areas

Good outside spaces add to you and your family's enjoyment of your house and property, while also adding value to your house. What you do with the outside depends on the size of the property, the footprint (size) of the house, the shape of the property and house, your lifestyle, what's important to you and your family, the overall style of the house, your future plans for the property, as well as the neighbouring properties and surrounding features. Of course it must also take account of the relevant building codes and property restrictions. Clever design can maximise your enjoyment of the outside spaces while poor design can diminish and even spoil the overall aesthetics, use and enjoyment of your house. Good design and clever placement of outdoor living areas can add to your internal living spaces, making them appear larger. While poor planning of the exterior could even make indoors appear dark and restrictive. It's therefore important to consider many of the items below before you finalise the design of your house because it could impact the arrangement of rooms, the orientation of the house, the position and size of windows and the location of doors to the outside. In fact, it's important to design the interior of your house while keeping an idea on what the outside spaces will look like so that they connect and form a complete unit.

External appearance (facade) – what everyone sees first

Many only concentrate on the internal appearance and layout of their house. Yet, the exterior of your house should be visually appealing to you, your neighbours and future buyers. Who wants to live in a house that looks like a box? It's important to consider how the house will look from the street and how it will fit into the neighbourhood. The house's façade is its face to the public. Sure, you don't want it to look like the neighbours houses, but it should be a little sympathetic to the environment and streetscape.

Of course the exterior of the house includes the garden, driveway and the boundary fencing or wall. They should complement each other. So a house that's cutting edge and modern might not be suited to a 'cottage' front garden, and a wire mesh boundary fence.

A striking façade can create a visual impact and make visitors want to see more. Create interest to the exterior of the house by using different cladding materials, even different paint colours. Avoid using only straight external walls by having parts of the housing ‘sticking-out’ from other parts which are set-back. Create interest at the front door. Try not to have the roof all in one plane and level.

The façade of your house will be impacted by:

- ➢ The placement of windows.
- ➢ The arrangements of the rooms in the house. This will dictate the location of your front door as well as garages.
- ➢ The size of the front of your house, which depends on the width of the property, the orientation of the house, the overall size of the house and the arrangement of the rooms in the house.
- ➢ The type and pitch of the roof.
- ➢ The size of the front porch.
- ➢ The architectural style you’ve chosen, which will impact external architectural details and features, the type of windows, the exterior wall finishes and the colours.
- ➢ The internal ceiling heights. Higher ceilings make for a higher external façade.
- ➢ Whether the house has two or more floors.
- ➢ The property boundary wall or fence.
- ➢ The garden landscaping.

Will you be proud of your house when you arrive home? What will the house façade say about the inside of your house?

Positioning the house on the property – getting it right

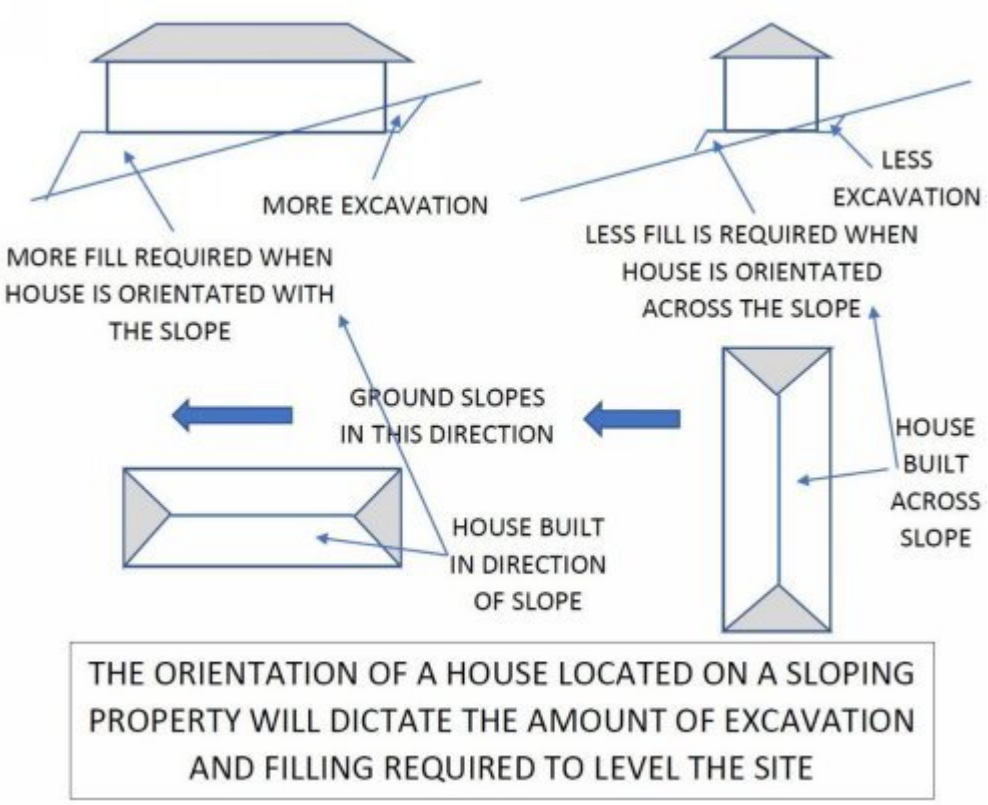
We’ve previously discussed the orientation of the house. Points to consider when deciding on the orientation of the house include:

- ➢ Potential views from the house.
- ➢ Privacy from neighbours and public roads.
- ➢ Noise from public roads – generally keep bedrooms and outdoor areas away from the noisiest roads.
- ➢ The shape and size of the property.
- ➢ The restrictions on the property, such as building lines, setbacks, servitudes, height restrictions, etc, as discussed in Chapter 4.
- ➢ The prevailing cooling breezes and the direction of severe storms.

- ➢ Generally houses in the northern hemisphere should face south and those in the southern hemisphere north, to maximise winter sun.
- ➢ Houses facing directly west should be avoided.

Case study: Our home lies along a north/south axis which means that the long sides of our home are on the eastern and western sides. Having a neighbouring house very close to the eastern side we get little morning sun, while our western side, which has large windows, receives full afternoon sun. This makes the house (particularly upstairs) hot in summer. It also means that in the afternoon we often have to pull sunshade blinds down to stop the sun fading and damaging our furniture and carpets, which then makes the house darker.

- ➢ The location of sewer connections. Placing sewage pipe outlets on the opposite side of the house to where the street connections are may not be possible if the connection lengths are too long and there's insufficient fall.
- ➢ Road access to the garages – it may be unworkable to position garages on the opposite side of the house from where vehicles access the property.
- ➢ Existing large trees which will remain on the property.
- ➢ The topography of the site. Building in the direction the ground falls requires more filling and excavation of the ground to level under the house.



➢ The size and location of your outdoor living areas and garden.

Case study 1: Our house is orientated almost exactly in a north/south axis. Living in the Southern Hemisphere means that the garden on the south side of the house receives sun all day in summer, but in winter the sun is north of the house so the house (a two storey building) casts a shadow across this part of the garden. We have a problem finding suitable plants for this area which has hot summer sun all day and is in full shade in the cooler months. Turning the house slightly may have provided shade to this garden for a few hours in summer, while allowing a few hours of sunshine in the winter.

Case study 2: A previous home had a veranda on the north west side of the house. Living in the Southern Hemisphere meant the veranda received nice winter sunshine. However, being on the west side on summer afternoons the veranda got unbearably hot. It was a small veranda so even a covering over the top didn't stop the afternoon sun hitting the entire area. While another home we owned had a veranda on the north east side of the house so it received the winter northern sun and in summer only the morning sun when it was cooler.

In the heat of summer the veranda was sheltered from the hot summer afternoon sun.

Future use of the land – unlocking value

If the property is large then thought could be given to either subdividing it now into smaller properties, building your house on one portion and selling the other portions. Maybe you could even contemplate doing this in the future when the children have grown up and you no longer need a large garden. Alternatively, you could consider building a flatlet for yourself in the future and then your children take over the main house. This may not be possible now because of the zoning of the land, but zoning could change later.

You could therefore consider positioning the house on one portion of the property, leaving a clear section to be separated and sold later. Remember, selling a portion of the property could impact the orientation of your house as well as its design. After all, the area which is now your planned garden may eventually be where you have a neighbouring house if you sold part of the property.

The neighbours – don't let them be a nuisance

Neighbours can on occasion be a source of frustration, spoiling the enjoyment of your homes. Sometimes minor disputes can turn into ugly full-on nasty battles. You can't always decide who your neighbours will be, nor can you control their behaviour. Smaller properties in particular can be a problem since your neighbours are living right beside you. Good design and careful placement of your house can help eliminate some potential problems. These include:

➢ Overlooking of your living and outdoor areas. This is particularly a problem with multistorey dwellings where upstairs windows overlook your property. You can create privacy by:

- Ensuring your boundary fence or wall eliminates some view from the neighbours. Of course take care this isn't going to create unwanted shade in your garden.
- Orientating your house so that your living areas, swimming pool and outdoor living areas aren't in direct view of the neighbours.
- Incorporating tinted windows which obscure the view from the outside in.

- Installing window coverings such as blinds and shutters.
- Planning your garden so that trees and shrubs block out the neighbours view.

➢ Noise from your neighbours which could be generated by equipment such as swimming pool motors and air-conditioning units, noisy hobbies such as rebuilding cars and other mechanical equipment, outside entertainment areas, and in particular swimming pools used by children, or, if your neighbour is a commercial enterprise then the noise of customers coming and going, early morning deliveries and collections, and various mechanical equipment noise. You can try and eliminate some of the noise by:

- Orientating your house so that your outdoor living areas and bedrooms aren't near the potential noise source.
- Installing double glazing to windows which are nearest the noise source.
- Ensuring roofs and walls are properly insulated against noise.
- Planting trees and shrubs to screen some of the noise.
- Avoiding hard surface areas and walls where the noise could be amplified and reflected

➢ Trees in neighbouring properties which drop leaves and fruit into your pool, garden and roof gutters, shadow your garden and have roots which damage drainage pipes, foundations and paving. It's important to remember that even small trees can grow into large problem trees. If your neighbour's trees could be a problem then:

- Consider the position of your house and pool relative to the trees.
- Avoid installing sewer pipes where the roots could damage them.
- Install measures to prevent the tree roots entering your garden. This includes various barriers, which aren't always a long term success.
- Install guards on gutters to prevent leaves collecting in them.

- ➢ Overshadowing of your swimming pool and outdoor living area. Tall neighbouring buildings close to your boundary may cast shadows over your property – especially at certain times of the year when the sun is lower on the horizon. There's not much you can do about this except position and orientate your house so that swimming pools and outdoor living areas are least impacted.
- ➢ Smells which could come from refuse storage areas, compost heaps, animal cages and cooking. You can try and lessen the impact from this by orientating your house away from these areas.

Of course you should be equally aware and considerate of your neighbours. You could be guilty of causing them problems. You should:

- ➢ Avoid having windows overlooking your neighbours. When you have windows overlooking your neighbour's outdoor living areas consider installing obscure glass, or position them high up in the wall so that from inside people can't easily look out and down onto the neighbours.
- ➢ Install noisy equipment such as pool motors and air-conditioning motors away from your neighbour's bedrooms and outdoor living areas. Also, select equipment that has a low noise output.
- ➢ Avoid planting large trees with invasive roots close to your neighbour.
- ➢ Locate swimming pools away from your neighbour's bedrooms and outdoor living areas.
- ➢ Avoid casting shadows over your neighbour's outdoor living areas by not building right against the boundary and by stepping upper level floors further back from the boundary on the side where your neighbour gets the most sun.

Internal courtyards – an asset, necessity or a nuisance

Internal courtyards are garden areas enclosed by the house. They can be private sanctuaries. A little oasis that you can look out on from inside. A water feature or statue can create an interesting feature.

Properties are becoming smaller and sometimes neighbouring houses are right on top of your house with no opportunity for windows along that side of the house, so a small courtyard brings daylight into your home.

In areas which aren't entirely safe, enclosed courtyards provide the opportunity to leave external doors and windows which face onto the courtyard open without you worrying that a stranger could come into the

house. Open windows and doors allow pets to wander in and out as they please, and fresh air to circulate from outside. Enclosed courtyards often provide extra privacy.

Of course courtyards can be a nuisance if they aren't carefully thought through.

Considerations for an internal courtyard include:

- They must be well drained so that even the heaviest rain won't flood the courtyard and enter your house. The drain shouldn't be easily blocked.
- Sounds obvious, but ensure there's a door to access the courtyard.
- Ensure there's a water point in the courtyard so that plants can be watered, water features can be topped up and the area can be washed.
- Think easy maintenance. Nobody wants to carry a lawn mower through the house to cut a couple of square metres (yards) of lawn.
- Don't plant trees and shrubs which are going to outgrow the space.
- Decide where you want lights in the courtyard.
- If the courtyard is large enough you may use it for entertaining, or even as a quite spot to read your book. Consider where you'll position chairs.
- Remember that the amount of sun and shade will vary during the year, and many courtyards will be in shade for a large portion of the year, but could get very hot in the middle of the summer, so understand what plants will survive in the conditions.

Enjoying your outdoor areas

Outdoor areas include, the garden, boundary fencing, driveway, car parking, swimming pool and entertainment area, which embraces barbeques and external seating.

The amount of outdoor space depends on the size and shape of the property and the footprint of the house. Single level houses have a larger footprint than multistorey houses. So a double storey house usually creates more outdoor space.

Positioning and orientating your house correctly can maximise the amount of outdoor space.

Outdoor entertaining areas should be easily accessible from the house, positioned away from noise sources (such as busy roads, or noisy equipment), be sheltered from the hottest sun, make use of pleasing vistas,

be mostly private, take account of the prevailing weather conditions, and generally be designed to allow for your and your family's lifestyle. These entertaining areas could be decked, paved or tiled. The finished floor should fit into the overall architectural style of the house. They could be covered (see below: pergolas and verandas). A well designed entertaining area can add immense pleasure and enjoyment for your family, as well as adding value to your house. Some may be tempted to add in built-in features such as barbeques, bars and wash-up areas, but often the cost of these features isn't worth it unless you regularly use them, and they also take up space which could reduce your seating area.

Having doors between the house and the patio which can open wide (folding back or sliding open) often enhances both the indoor and the outdoor space, creating a multiuse area and a nice easy flow from inside to outside.

The size of the patio is dictated by the space available, your budget, your entertaining needs and creating a balance between the house, entertaining area and the garden. Don't be tempted to create an outdoor entertaining area which dominates the entire house and garden.

A well designed garden can:

- ➢ Add to your privacy by shielding the house and external living areas from the neighbours and the street.
- ➢ Help cool the house, providing shade to the external walls of the house and living areas.
- ➢ Protect the house and external living areas from the worst winds.
- ➢ Create a play area for children.
- ➢ Help dampen the sound from neighbours and the street. Vegetation absorbs noise and reduces sound bouncing off hard surfaces such as walls.
- ➢ Add to the architectural appeal of the house – think of a rose garden or cottage garden which could suit 'cottagey' or 'English' style architecture.
- ➢ Provides a food source when a vegetable garden and fruit trees are incorporated.
- ➢ Add to the overall appeal of the house.
- ➢ Attract wildlife to the property, particularly birds. Select the right plants and trees to provide food and create shelter for the birds.

- ➢ Provide enjoyment, as well as space for an outdoor hobby or activity.
- ➢ Create a green, pleasing vista from inside your home.

Gardens should:

- ➢ Generally be easy care and water-wise (not requiring lots of water).
- ➢ Be in keeping with the architectural style of the house.
- ➢ Allow for your family's needs and lifestyle.
- ➢ Be within your budget.
- ➢ Take account of your interests and time constraints.
- ➢ Consider the local weather and soil conditions.
- ➢ Be safe. For instance ponds may have to be protected so that children don't accidently fall in. Avoid large unprotected drops where people could fall.
- ➢ Take into account bushfire risks.
- ➢ Allow for the future use of the property, which may include installing pools, sheds, garages, etc. You don't want to be planting expensive plants in an area you may be digging up in a couple of years.

Patios, Pergolas, verandas and gazebos – relaxing outdoors

Pergolas, verandas and gazebos serve a number of functions. They provide shade, afford shelter from rain – especially for furniture, and they can architecturally enhance the house.

A well-constructed veranda, pergola or gazebo will provide hours of enjoyment for you and your family to enjoy the outdoors. It could provide an attractive feature for your house and garden at a relatively low cost, while adding value to your home. It can also provide an additional living and entertaining area, a sheltered area for pets living outdoors, and create shade against the house which in warm climates helps to cool the house.

Regrettably they are frequently badly designed, poorly thought through and badly constructed. Problems with pergolas, verandas and gazebos include:

- ➢ They make the interior of the house dark because they shade the windows. This can be alleviated by incorporating translucent sheeting in their roof to let light in – this however may increase the heat under the pergola.

- ➢ They aren’t designed or built correctly, so they could fall down, particular when there are strong winds, hail or snow.
- ➢ They are orientated the wrong way so they offer little protection from the sun when it angles in from the sides. Driving rain may also come from the sides wetting large areas.

Case study: We wanted to erect a shade roof over the outdoor sitting area of one house. We had two problems, one, that the covered area would make the inside of the house darker and secondly, that the area was very small, with no protection on the western side, so every afternoon after about 2.30pm the sun would be angled such that the whole area under the roofed area would be in sun anyway.

- ➢ They could be too large relative to the size of the garden, leaving little space for a garden or swimming pool.
- ➢ They don’t fit with the architectural style of the house so look out of place.
- ➢ Sometimes they just look cheap and detract from the appearance of the house.
- ➢ They incorporate materials which weather badly in the rain and sun, requiring constant maintenance and even replacement.
- ➢ The patio is elevated above the surrounding garden so somebody could fall off the edge and hurt themselves. Drop-offs greater than fifty centimetres (eighteen inches) should have a railing.

Roof coverings could consist of a few poles or beams with lattice work for creepers to cover the area. Erecting shade sails provides a cheap shade solution but they don’t keep the rain out. The sails could even be taken down in winter when they aren’t required. Roofs could be more complete structures with tin or Perspex sheets supported by a steel, timber or brick structure. Alternatively the roof of the house could be designed to extend over the patio or veranda. A double storey houses can be designed with an upstairs living area or balcony forming the roof over the veranda.

The location of the veranda, gazebo or pergola could be impacted by:

- ➢ The direction of the sun at different times of the day.
- ➢ The interior layout of your house – you want outdoor living areas to be easily accessed from the living and kitchen areas of the house and not situated right outside bedrooms.
- ➢ Privacy, you might not want the neighbours overlooking your outdoor living areas, or for it to be visible from the street.

- ➢ Location of the swimming pool. You probably want easy access, but not where the area is going to be splashed.
- ➢ Noise from neighbouring properties, and the surrounding area.
- ➢ Architectural features of the house.
- ➢ Underground services which could prevent the construction of foundations.
- ➢ The slope of the ground. Steeply sloped ground may require the area to be levelled at additional cost, and additional steps could be required.
- ➢ What time of day you will mostly use the area.
- ➢ Views from the veranda.
- ➢ Existing large trees which you may want to keep, or incorporate into the design.
- ➢ The prevailing wind direction.

It's important to consider the following when designing your patio or veranda:

- ➢ The size of the covered area should depend on the number of people that would normally use it, the size of the property and your budget.
- ➢ The design of the structure and the materials used to form the structure and to cover it. Local bylaws could restrict the type of materials that can be used.
- ➢ Your budget will impact the choice of materials and floor finishes.
- ➢ Whether you want to include an external kitchen or barbeque area.
- ➢ The usual weather conditions.
- ➢ If you want to be able to close the sides of the veranda during some time of the year, or maybe even at a future date when you have more money.
- ➢ Matching the architectural style of the house.
- ➢ How the water will drain from the roof.
- ➢ How the structure will tie into the house if required.

Having a roof covering that can be opened or closed can give you the best of everything – sheltering the veranda from the rain and worst sun, but being able to be opened to allow sun and light in when you want it. We have a covering over our veranda which consists of louvres which are remotely controlled to turn at different angles. This even means that if they are

angled correctly they can be open, allowing light in, but so the direct rays of the sun are blocked out – preferably the blades should run along the east/west axis. Some of these coverings can even have rain sensors so they automatically close when it rains.

Swimming pool – love them or hate them

Swimming pools are great for children, and they can add value to your house in hot climates. Who doesn't like a cool dip after a hot day, or enjoy a warm weekend relaxing around the pool having a barbeque with family. However, pools come with downsides which include:

- ➢ They're often costly to install.
- ➢ They use water and power and can add considerable costs to utility bills.
- ➢ There're usually laws requiring pools to be fenced. Even if it's not a requirement, for your peace of mind you should ensure that the pool cannot be accessed by unsupervised young children. Many children drown in unprotected pools every year. Fencing around the pool can be unsightly, negatively impacting the property.
- ➢ Pools in most areas are only used during the summer when water temperatures are warm.
- ➢ They require regular cleaning and maintenance.
- ➢ Most pools are seldom used when children grow-up, or when the novelty fades.
- ➢ Some buyers avoid properties with pools since they don't want the additional maintenance and expense.
- ➢ Pools reduce the size of the garden available for other activities.

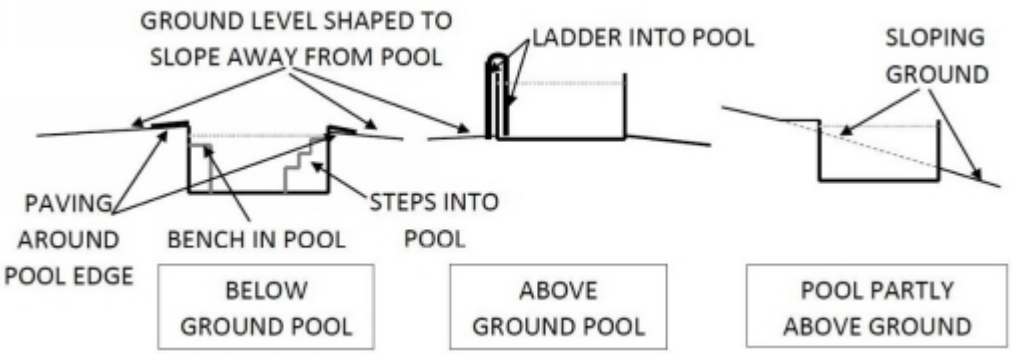
The neighbours across the road have two small children so they installed a swimming pool. They had a very small garden and once the pool was installed there was no garden and the poor dog had nowhere to toilet anymore. Without a garden, dog and children had to play in the road and the park.

Poorly constructed or designed pools can lead to problems which include:

- ➢ Leaks from the pool or the connecting pipework.
- ➢ Cracks in the pool, or along the surrounding paving
- ➢ Delamination of the finishes in the pool, such as tiles falling off.

- ➢ Settlement of the complete structure – the pool sinks into the ground.
- ➢ Difficulty of automatic cleaning equipment to reach all areas of the pool.
- ➢ Damage to the surrounding building foundations.
- ➢ Inadequate filtration systems which don't circulate the water in the pool properly, or don't clean the water.
- ➢ Pools with a rough finish to the sides and bottom are more difficult to clean and algae grows easily on these surfaces.

Swimming pools can be below ground (where the top of the pool is level with the surrounding ground), or above ground (where most of the pool structure is above the surrounding ground). On sloping properties where the pool is located on ground which slopes away from the house the pool could be below ground adjacent to the house (or partly below) so that the top of the pool is below the inside of the house, while sections of the pool further from the house are above ground or partly sunken as the ground level falls away.



Pools can be constructed in-situ using various cementitious products or they can be delivered ready made from fibreglass or other products. Below ground pools require a hole to be excavated for the pool. Below ground pools usually look better and blend into the surrounding landscaping.

It's important to consider the location of the pool.

- ➢ Below ground pools generally can't go where there are sewer or stormwater pipes since these are often difficult (sometimes impossible) and expensive to relocate. Even deviating underground water pipes, electrical cables, gas pipes and communication cables adds to your costs.
- ➢ Pools can't be constructed within servitudes.

- ➢ You want the swimming pool to be in the sun, so avoid constructing it under large trees or where it will be shadowed by your house or the neighbour's house.
- ➢ Below ground pools built right next to your house, or the neighbour's house will probably require the foundations of the house to be strengthened. The design of these foundations and the pool must be done by an engineer. You don't want parts of your house falling into the pool!
- ➢ The pool should fit into the garden landscaping and with the house.
- ➢ You probably don't want the pool in the front yard by the street, rather it should be an extension of your outdoor living area.
- ➢ If the kids are going to be using the pool with friends you possibly won't want it outside your home office.
- ➢ Avoid building the pool where it could be flooded by stormwater. Shape the ground around the swimming pool to channel stormwater away.
- ➢ Excavating in rock is expensive, so where possible position below ground pools where there'll be the least amount of rock.
- ➢ When properties have a high water table (higher than the bottom of the pool) this can be problematic when constructing a below ground pool. Not only is the construction more difficult because ground water must be kept out of the excavation, but once completed the pool could float out of the ground when it's empty – like a ship in water. Care must be taken when emptying below ground swimming pools for maintenance that they don't float up, particularly after prolonged periods of rain which have raised the water table. It's possible to design and construct below ground pools so they don't float in areas with a high water table.

Pools come in varying shapes, sizes and depths. When designing a pool you should consider:

- ➢ What's the best size and depth, taking into account the available space, your requirements, budget and the running costs. Larger deeper pools cost more to install and to maintain (using more water, power and chemicals). If you're looking to regularly swim lengths then you may want a longer and narrow pool. If it's just to cool down then a small pool will be fine.

- ➢ The shape of the pool, which could be impacted by the available space, your needs, as well as the architecture of the house. Some shapes suit certain architectural styles better than others.
- ➢ The colour of the pool.
- ➢ The materials that the pool is constructed from.
- ➢ How the pool connects to the outdoor living spaces and the house.
- ➢ How the pool connects to the garden.
- ➢ Where the pool motor and filter will be situated so it isn't unsightly or a nuisance to you or your neighbours.
- ➢ The extent and type of paving around the pool, which mustn't become slippery when wet.
- ➢ The size, type and location of steps into the pool.
- ➢ Whether you want internal seating in the pool.
- ➢ The type of filtration and water in the pool, which could be saltwater or chlorinated.
- ➢ Whether a water feature is included.
- ➢ The type of fencing required around the pool, which could be glass, metal or other.
- ➢ Whether you want to heat the water so the pool can be used in colder weather. Heating is usually achieved by installing solar water panels. A solar blanket can also be incorporated to cover the pool when it's not in use, thus trapping some of the heat in the water.

Selecting the wrong size or shape for your swimming pool could spoil your enjoyment of the pool, as well as detract from the value of your house.

Water features – making a splash and not a plop

Well-designed water features can be an asset to your home and garden. Poorly designed features can be a nuisance to clean and a risk to children and pets. Water features include fishponds, fountains, simple birdbaths, and for the more ambitious landscaped streams.

Water features can act as a cooling mechanism if positioned to catch the breeze blowing through the house, they help block out road noise and the neighbours with the sound of tinkling water, they can be a statement in the garden, they often attract wildlife especially birds, and they may be a hobby if you like exotic fish.

Important points to remember are:

- ➢ You need a power point nearby if you intend to install a pump and or lights.
- ➢ A water point close by will enable the pond to be easily topped-up.
- ➢ The sound of water can drown out conversation and television sound, so place fountains where they won't become an irritant, or ensure they can be easily switched off.
- ➢ Birdbaths, or ponds for birds to drink and bathe, should have shallow areas or places where birds can easily reach the water.
- ➢ Placing a birdbath where it's visible from your study, kitchen or living room window can provide hours of enjoyment.
- ➢ Birdbaths generally shouldn't be placed too close to thick bush where cats could easily hide and pounce on bathing birds.
- ➢ Fountains shouldn't splash water out because then they require frequent topping up.
- ➢ Always consider how you'll clean the water feature.
- ➢ The bowls, or reservoirs, of fountains should be large enough so they don't quickly dry out (from splashing and evaporation) and require frequent refilling. If the water level falls below the pump while it's running it could burn out.
- ➢ Ensure that pets and children can't fall in and drown.
- ➢ If the pond is for fish then consult experts, or read books, for ideas for incorporating plants, keeping the pond clean, the size of the pond, protecting the fish from predators (such as certain species of birds) and for more ideas.
- ➢ Water features can be purchased off the shelf or custom designed and made to suit your garden.
- ➢ Always ensure ponds are watertight.
- ➢ Elevated water features and fountains must be stable, with a solid footing, so they can't easily be knocked over, possibly injuring a child.

Parking on your property

You should consider parking for your cars, possible future requirements for kids' cars, visitors, and for some of you, even boats and caravans. Most people are looking for secure off-street parking which is usually an asset. Even if you have garages you may still want off-street parking for family and visitors.

Fencing and walls – good neighbours start with a good fence

Fencing around the property provides some of the following:

- ➢ It demarcates the boundary between your property and the neighbouring properties, public roads and sidewalks. A proper boundary fence means there's less possibility of you entering or damaging neighbouring properties.
- ➢ If you own dogs then a secure fence ensures they remain on your property. It also ensures your neighbours' dogs don't enter your yard.
- ➢ Boundary walls can provide privacy to areas of your garden and house.
- ➢ Some fences and walls improve security, making it more difficult for intruders to enter your property.
- ➢ Fences or walls can ensure others don't intentionally, or inadvertently enter your property. Particularly if you have a swimming pool or a pond unsupervised children mustn't be able to gain access where they could accidently drown.
- ➢ A nice boundary wall or fence can add to the value of the property.
- ➢ Boundary walls can also help dampen noise from outside the property, such as from highways, railway lines and neighbours. However, it should also be noted that walls can act as a noise reflector, directing noise towards the house. This can be mitigated by growing trees and shrubs in front of the wall, or using materials and designs that absorb sound.

Boundary fences and walls should:

- ➢ Comply with local permits and permissions and the estate rules which may dictate the maximum height, the type of materials and the type of structure.
- ➢ Not be built outside your property boundaries.
- ➢ Be designed and constructed so they can't easily be pushed over by the wind or by people.
- ➢ Where they are between neighbouring properties, be constructed after consultation with the neighbour.
- ➢ Be aesthetically pleasing, even adding to the architectural style of the house.

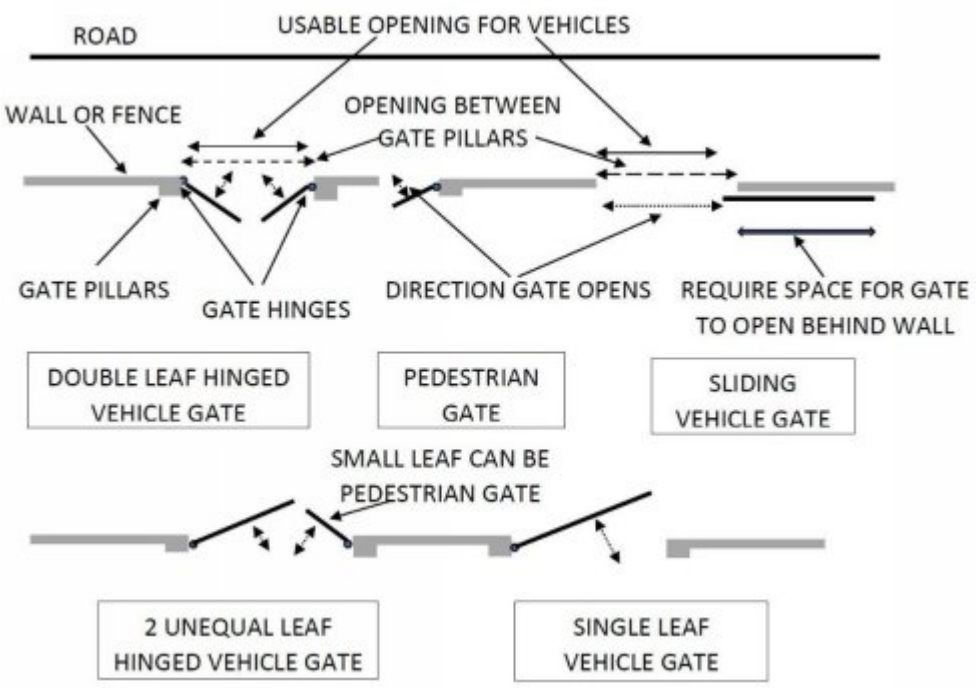
- ➢ Be safe, so that people or animals can’t come in contact with sharp edges or live electrical wires.
- ➢ Take into account the existing trees and their future impact on the fence or wall. As trees grow bigger their trunks thicken and if they’re too close to the wall they may push it over. In addition tree roots could damage the wall’s foundation. Consider stepping walls around trees just outside your property.
- ➢ Take into account the reason why the fence is required. So for example, a fence to keep dogs in or out shouldn’t have gaps where the dog can squeeze through, nor should the dog easily burrow under, or be able to jump over it. Fences to keep small children out shouldn’t be easily climbable so shouldn’t be constructed from horizontal or inclined bars which provide easy footholds. Of course, having a good fence to keep dogs or children out (or in) is pointless if the gate isn’t shut, or if the gate can easily be climbed or opened – see the next section.
- ➢ Not cut off natural water courses or impede the flow of stormwater.
- ➢ Where high walls are involved, be designed by an engineer.

It should be noted that although walls are viewed as a deterrent to intruders, sometimes they’re an aid to them because once over the wall their presence in your yard and house is screened from the view of neighbours and people in the street.

Gates – nuisance or asset

To secure the property gates are installed to allow access through a fence or wall. This access could be for vehicles, in which case when the gates are open the gap must be wide enough for a vehicle. (Note that gate hinges take up space, so the gap between the supports holding the gate (or the gate pillars) is often more than the actual gap when the gates are installed and open.) Additional space may be required when vehicles can’t pass straight through the gate but are turning in.

Gates can be single leaf (one gate spans the entire opening) with a hinge on one side, or they are double leaf with two gate halves meeting in the centre (or one leaf could be larger than the other) or the gates could be sliding on a rail. The gates could be manually operated or automated.



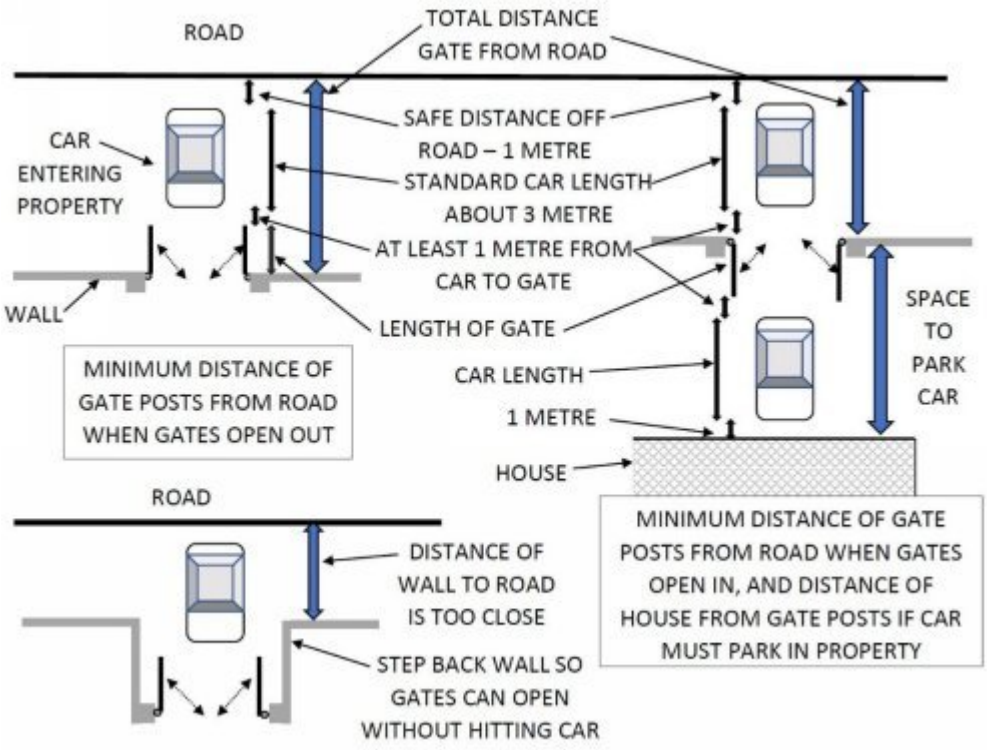
Considerations for automated gates include:

- ➢ They require a power source.
- ➢ The motors operating the gates should preferably be installed on the inside of the property where they're less likely to be interfered with, or stolen.
- ➢ There should be back-up power systems or batteries when frequent power interruptions occur.
- ➢ There should be a mechanism to manually operate the gates if the opening mechanism, or motor fail.

With hinged gates it's important to note that:

- ➢ The wall, pillars, or supports where the gate hinges are fixed must be strong enough to carry the weight of the gate, plus extra weight should kids ride on, or climb over the gate.
- ➢ The hinges must be sufficiently robust to support the gate.
- ➢ The gate must be strong so it doesn't deform under its own weight.
- ➢ Generally the lighter the gate the better.
- ➢ The bottom of the gate has to be above the ground level over which it must swing open and shut. This could be a problem on sloping driveways and roads, in which case gates might only be able to open towards the downhill side of the driveway.

➢ Vehicles have to stop a distance away from the gates to allow for the gate not to hit the vehicle when it swings open. This could be a problem when there isn't sufficient space for vehicles to move off the public road and into the driveway so you have to either step the wall back, install a sliding gate, or have the gates open inwards. Gates opening in could reduce parking inside.



Gates not only add security and privacy to a property, but attractive gates also enhance the value of the property. Gates required for security purposes shouldn't be easily climbable so shouldn't have horizontal bars or foot and hand holds.

The gate should be in keeping with the perimeter fencing or wall, as well as the external appearance of the house. Occasionally people go 'over the top', building a substantial gate and gatehouse which looks out of proportion with the features and the scale of the rest of the house.

Sometimes pedestrian gates are useful to allow people to walk through without opening a large vehicle gate.

It's beneficial to provide adequate lighting at your gates or driveway entrance, especially lights to illuminate the house number.

Rubbish disposal – don't let it cause a stink

All households create waste which has to be disposed of. In most cities rubbish and recyclables are collected by the authorities. But, usually this collection is only done once a week, or once a fortnight. Homeowners need to store the rubbish and then put it out on the street for collection. Houses should allow a suitable storage area for the refuse bins. This area ought to be easily accessible so rubbish can be moved to the street. It's useful if there's a tap and a drain so that refuse bins can be easily washed. These bins are often unsightly and sometimes smelly, so it's good practice to have the area screened and positioned where it has the least impact on neighbours and your living areas.

In the kitchen there should be sufficient place for receptacles to hold rubbish as well as various recyclables.

If you're planning a garden it's useful to have a compost bin where plant and grass clippings and green food waste can be used to create compost, which is good for the garden and reduces the waste you'll be throwing out.

Clothes blowing in the wind – eyesore or useful?

In this age of clothes dryers it may seem odd to be considering place to airdry your washing. Yet naturally drying washing is a cost effective method that reduces electrical costs. Unfortunately many homes don't consider drying areas properly, so the drying lines are placed where they don't get sun or where they're an eyesore.

Drying areas should preferably be in an area:

- That is easily accessible from the washing machine. You don't want to be carting wet washing up and down stairs, or to the opposite end of the house.
- Which gets sun for at least half the day all year.
- That gets a breeze.
- Where it's not visibly displeasing to the neighbours and the passing public.
- Where it doesn't detract from your living areas (both indoors and outdoors).
- Where the lines can be easily reached, but at the same time won't create a hazard to people walking past where they could hit heads and injure themselves.
- Where it's safe and washing won't get stolen.

If space allows, a separate enclosed drying area or courtyard is an ideal solution.

External lights

Exterior lighting aids security, helps light the front door, can be an architectural feature during the day and when the lights are on at night, allows external entertaining areas to be used at night, and they can be used to highlight key focal areas at night such as water features, plants, statues and even your swimming pool.

External lights could be installed on the walls of the house, over the front door, under patios and pergolas, on garden walls, along pathways and in the garden. Some areas need to be brighter than others, while you probably don't want dark shadows where you may be walking at night.

It's important to note the following for external lights:

- ➢ Light fittings exposed to the weather must be waterproof.
- ➢ Electrical cables must be buried and protected so they can't be easily damaged when people work in the garden.
- ➢ Bright lights should not irritate the neighbours, or distract drivers of passing vehicles.
- ➢ Light fittings exposed to the sun must be able to withstand the sun.
- ➢ Light fittings in coastal areas should be able to withstand the corrosion caused by sea air.
- ➢ Light switches should be in easy to reach places close to external doors.
- ➢ Avoid going overboard with too many lights, or lights that make you house appear like a Christmas scene the whole year around.

Clever placement and choice of lights can enhance your security, the use of your outdoor areas, and add to the visual appeal of the exterior of your house and the garden. The right light fittings can add to the architectural style of the house.

Summary

The outside of your house is almost as important as the inside of the house. It's what visitors see first. It's often a space for kids to play and a space for the family to enjoy. When the weather is good it's even a good space to entertain visitors. Some people enjoy gardening, while fresh fruit and vegetables grown in your garden can make for healthy eating while saving you money. But the outside often impacts the inside of the house. It

can darken the interior or it can be a valuable addition adding more space to the indoors, providing screening from the neighbours, shading the house in summer, giving a pleasant vista through windows, and even dampening external noise.

So consider the following when designing your home:

- ➢ What will the outside of your house look like?
- ➢ How will you integrate the house with the garden to create an outdoor living area, place for pets and children, shade and privacy?
- ➢ What trees and plants will you plant and where? How about play areas for the kids?
- ➢ What about an indoor courtyard to let extra light into the house or add a private and secure outdoor area?
- ➢ How will the house sit on the property, allowing for possible future expansion, or future use of the property? Is it orientated correctly?
- ➢ Do you want a swimming pool, where, what type, the shape and the size and depth?
- ➢ What type of fencing and gates do you want around the property?
- ➢ Where will rubbish bins be stored?
- ➢ Do you want clothes wash lines?
- ➢ What external lighting is required?

Chapter 6 – Simple Ways to Improve Your House

There are often many simple ways that can transform your house at relatively low expense into a ‘new home’ that will better fit your needs and where you and your family will enjoy living. It may be unnecessary to embark on a costly and time consuming project to build a new house, or to radically alter your existing home.

It’s a matter of understanding what you don’t like about your house, then analysing what you can do about it. Sometimes it’s just about a change!

Below are a few ideas that could help you create a ‘new home’ at a modest cost. Some may even be useful ideas should you decide to embark on a major renovation, or build a new house.

Lack of space – illusion or reality

Lack of space is one of the biggest reason for embarking on a home building project. Obviously if there’s a need for an extra bedroom because of a growing family (additional children or elderly parents moving in) then there’re usually few options except to add another bedroom.

But, frequently a lack of space is caused by:

- An accumulation of junk and unused items. Do you really need all of that stuff? It’s probably time for a big sort through and tidy up! In fact selling those unused things may even bring in some extra much needed cash.
- Untidy and badly packed cupboards. Tidying up clutter and cupboards will often free up additional space. A tidy home can be like a new home.
- Lack of storage. Many homes lack proper storage, or the storage is poorly laid out. See the next section.
- Furniture that’s too large or that’s not needed. Frequently when we move houses we take the furniture we had, which fitted our previous house nicely, and then try and cram it all into our new home which has different size and shaped rooms. Getting smaller furniture (which is just as functional) can free up floor space and make the room appear less cramped.

- ➢ Get furniture that's purpose made. This may seem expensive, but often purpose made furniture creates more useful space as it fits the area exactly.
- ➢ Install fitted cupboards and get rid of freestanding wardrobes and dressers.

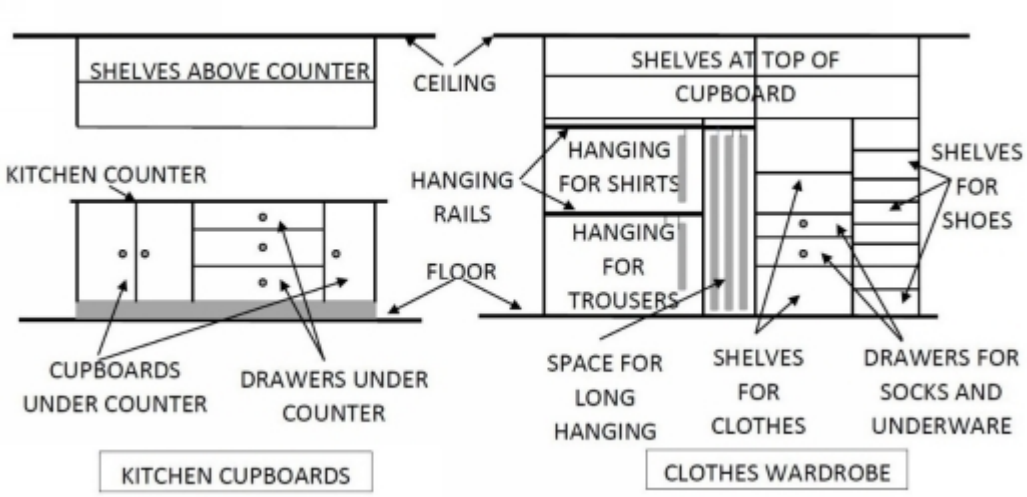
Adding storage – creating more space

Adding more storage gets rid of the clutter and frees up space. Storage can be added by:

- ➢ Altering the existing cupboards. Many cupboards are badly designed and often consist of a couple of shelves and a hanging rail. Frequently cupboards can be redesigned to take double of what they currently do. This can be done by:

- Adding a second hanging rail – one for shirts and one for trousers below it.
- Adding additional shelves. Often the spacing between shelves can be reduced for some items.
- Ensuring the shelves are the full depth of the cupboard. Often there is wasted space between the front of the cupboard and where the shelves start.

- ➢ Adding additional cupboards. Sometimes kitchen cupboards can be added above the counter if they aren't already installed. Cupboards extending to the ceiling could store items which are seldom used.
- ➢ Installing shelves and racks in garages.
- ➢ Purchasing a small shed for the garden to store tools and gardening implements. Make sure the shed is watertight if you're storing stuff that could be ruined if it gets wet.
- ➢ Converting the roof space into an attic for storage, or maybe even an extra room.



Does your house feel smaller than it is?

Does your house feel small and claustrophobic? We can't all afford to live in large houses. In fact, many choose small houses, they're easier to clean and cheaper to run. Houses are shrinking in size in many cities as land and construction costs increase. But we can make small houses appear and feel larger.

- ➢ As stated above, we can add storage and reduce the size of furniture. Do you need a large table at the entrance or could a narrow one be equally as good? Could we make do with a smaller dining room table – maybe one that extends when necessary for bigger gatherings?
- ➢ Dark walls, carpets, countertops and cupboards make rooms appear smaller. Paint your walls, trim and detailing different shades of white. Light reflects and bounces off white making rooms appear larger.
- ➢ Even dark furniture makes a room feel full, even cluttered. Have the basics light coloured and then add splashes of bright colour as an accent.

Case study: We moved lots of furniture from one home to our next home. The house we left had large rooms which were very light and the house had an Italian style, so we had lots of large solid wood furniture. The new house was slightly smaller, it had a modern style, but some parts of the house were dark. The large items of dark wood furniture looked out of place. I bought a can of white paint and painted the bookcases and desk white. The stools in the kitchen got a coat of silver

paint. Suddenly the furniture brightened the room and suited the modern style of the house.

- ➢ Consider hanging large mirrors in the entrance, in the main bedroom and in the bathrooms. Careful not to overdo the mirrors though!
- ➢ Be clever with the way you use space. Is there an unused corner, or place under stairs or under washbasins that's not properly utilised?
- ➢ Relook at window treatments. Heavy dark curtains protruding into the room take up space and make the room appear smaller. Installing blinds or shutters that sit within the window opening requires less space, it's neater, and if they are in light colours they help brighten the room.
- ➢ Mount things like the television set on the wall.
- ➢ Use furniture that has additional storage, like beds with drawers under them and tables with shelves underneath.
- ➢ Make the outdoors part of your house. If you have a patio or veranda, how does it connect to the house? Doors that open back wide makes the outdoor space feel part of the indoor entertaining area, especially if the floor finish on the veranda is the same (or similar) as the indoor space, or it looks like an internal floor finish. Consider how you can use the veranda more by for instance covering it with a roof, extending it, covering the floor with tiles, installing a ceiling fan for summer and a heater for winter, and perhaps, zip down insect screens or blinds. Not only is the veranda an addition to the indoor space, but with doors wide open it appears as though the house extends out further than it does. Make your outdoor area a secondary living space.
- ➢ Make better use of a balcony in the same way.
- ➢ Adding skylights can brighten rooms.

Change lights – brightening up your house

New lights can make a room lighter and brighter, change the look of the room (often making it more modern and newer) and reduce your power bill. Older lights are often less efficient than new lights. In addition, getting rid of dark coverings and shades on lights makes lights brighter, possibly meaning that fewer lights are required.

New lights don't have to cost a fortune. Sure, they need a licensed electrician to install. An outlay of a couple of thousand dollars can give all

the rooms in your house a new look.

If you add lights which are combined with a ceiling fan you can add additional cooling at a nominal extra cost. Ceiling fans come in a multitude of designs and colours which can add to the style of the house at a modest additional cost. Fitting fans with a remote control doesn't require additional electrical wiring, only maybe a few extra timber supports in the ceiling.

Repaint – give your home a new look

Repainting walls can instantly give your house a new look, especially if you select colours which are light and bright. Stay away from dark colours and stick to shades of white or pastel colours – you can always add splashes of vivid or dark accent colours to trims like window and door frames, doors, gutters, metalwork, etc, for impact. Always choose a good quality paint that will wear well and is easily cleanable. You probably don't want to be repainting walls every couple of years because they're looking dirty or blotchy. Make sure that the paint you use is suitable for where it will be applied. Some paints are only suitable for internal use, some paint can be more easily wiped clean and other paints shouldn't be used in wet areas. Surfaces should be properly cleaned and prepared before they're painted.

Even some old roofs can be reinvigorated with a new coat of paint. But always check that the paint is suitable for the roof covering material, that the roof is sound and it is cleaned and dried properly before the paint is applied, and preferably get an expert to apply it – you don't want to be falling off the roof!

Skirtings – finishing your house

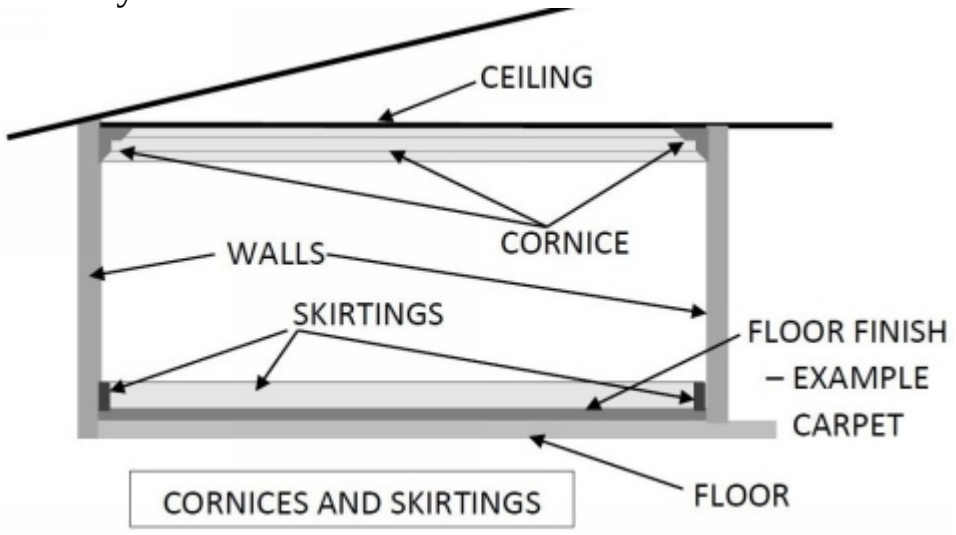
Older houses usually had skirtings to neaten the edge where the walls meet the floors. Skirtings also protect walls from bumps and bashes when brooms and vacuum cleaners are used. Nowadays, many builders leave skirtings off in an attempt to save money, or they use a cheap small skirting. There're numerous shapes and size of skirtings and selecting one that adds to the architectural design and décor of the room can immediately give the room a more luxurious feel at a small additional cost. The skirtings are available in different types of wood and even PVC.

Just a note, it's good practice to give the back and underside of timber skirtings a coat of paint or varnish before installing to protect the skirting from water ingress.

Normally in bathrooms use a tile skirting, or if the walls are tiled then no skirting should be necessary. Wood skirtings are never a good idea in wet areas, especially skirtings of composite wood that will swell and deform when wet.

Install new cornices – a small trim makes a difference

Where the ceiling meets the walls it's good practice to install a cornice (moulding) which provides a neat edge and hides any difference of movement between the ceiling and the walls. The convention is to use a cove cornice, but there's a variety of different shapes and sizes of cornice which could match the architectural style of your house. Adding a new cornice can make your rooms feel more luxurious for a relatively small cost and they are easy to install.



Door Handles – they don't have to be just door handles

There are a variety of door handles and fittings. Unfortunately, often contractors select the cheapest fittings which can look very ordinary and even wear badly with time, becoming grubby, discoloured and with the outside coating peeling. Selecting better quality fittings which match the architectural style of the house can give your house a more luxuriant appearance.

Of course, when selecting fittings to replace those on existing doors you need to ensure that they fit the holes cut in the door for the existing fittings. You might not want to replace the complete door because you've changed the locks or door handles.

Always remember to keep the colour of locks, latches, handles and hinges the same. Mixing brass fittings with chrome looks unsightly.

Of course, at a modest additional cost you could replace some of the doors. A new entrance door can project a new image of the house. Doors come in a variety of designs and patterns which can add to the style you want to achieve. Using doors with glass panels helps lighten the house. Even opaque glass panels allow light through.

New external doors which are insulated, with good seals, help insulate the house, thus reducing heating and cooling bills.

Change carpets – refresh your home

Changing carpets can create a new refreshed look. Always ensure the old underlay is removed, all dirt is cleaned and that any mould is treated before the new carpet is installed. Use a good quality underlay which will help protect the new carpet, assist with insulation and provide the carpet with a more luxurious feel.

Select colours that are light, but not too light that they'll show all the dirt. Look for carpets that can be easily cleaned and that are hard wearing. Avoid heavily patterned carpets.

In cooler areas you could consider installing underfloor heating.

Curtains, blinds and shutters – more than privacy

New curtains, blinds or shutters can change a room. Lighter colours can brighten rooms. New window treatments can help insulate the room from temperatures outside and even reduce noise.

Improve the garden – creating a new outlook

Improving gardens can make a difference to your property. This could range from a tidy-up and minimal cost, to a full-on landscape done by experts. Initial easy steps could be:

- ➢ Cutting back overgrown vegetation, even removing large trees that are excessively shading your house and garden.
- ➢ Removing old and tired looking plants, or ones that've become excessively woody.
- ➢ Tidying up mess.
- ➢ Installing a shed for garden tools (or even racks in the garage).
- ➢ Removing weeds.
- ➢ Adding mulch to garden beds. It's amazing how covering garden beds with wood chips or bark can refresh the garden, and it helps retain soil moisture and reduces weed growth.

- ➢ Fixing damaged, sinking, cracked and uneven paving. Even install new paving.
- ➢ Planting new flowering plants to brighten up the garden.
- ➢ Installing an automatic sprinkler system.
- ➢ Making the garden easy care, which could include removing plants that require lots of water, taking out areas of lawn which are difficult to cut, and putting in plants that don't require regular cutting.
- ➢ Adding a water feature.
- ➢ Removing dead areas of lawn under trees and planting shade loving grass or plants.
- ➢ Installing edging strips around garden beds to keep the lawn out.
- ➢ Planning a compost heap. Adding vegetable waste from the kitchen with lawn and garden clippings can make valuable compost which can be added to your garden, reducing your waste and fertilizing your garden.

Add, or improve, outdoor living areas – enjoy the outdoors

Improving the outdoor living area could add immensely to your family's enjoyment as well as adding value to your property. This could include:

- ➢ Constructing a flat level area which has a paved, tiled or timber deck flooring.
- ➢ Constructing a pergola or covered veranda to provide shade over the area.
- ➢ Adding privacy to this area by erecting screens on one side which have creepers planted to cover the screen. Using other plants to form a screen, or even constructing a timber fence or wall.
- ➢ Purchasing nice outdoor furniture.
- ➢ If you're feeling more ambitious, then building a barbeque.
- ➢ Installing large doors connecting the house to the outdoor living area.

Maintenance – fixing what's broken

Regular maintenance is essential in every home. Unfortunately the lack of maintenance leads to further problems and spoils our enjoyment of the home. Often people look to move from their homes for silly reasons that can easily be fixed. So maintenance could include:

- ➢ Fixing doors and windows that jam.
- ➢ Repainting the house.
- ➢ Cleaning and servicing air-conditioning units so that they're more effective.
- ➢ Repairing leaks.
- ➢ Repairing broken lights and appliances.
- ➢ Replacing cracked and broken tiles.
- ➢ Repairing damaged insect screens.

Sound proofing – tired of hearing the neighbours

Some houses can be noisy which could be because of:

- ➢ Noise from the outside, such as traffic, aeroplanes or the neighbours. Noise can be reduced by fitting double glazing to windows. Placing insulation in the ceiling void. Installing window treatments such as heavy curtains. Planting shrubs and trees in the garden to absorb noise. Even grass instead of paving helps absorb some noise and prevents noise reverberating. Constructing perimeter walls and wooden fences, or even installing glass panels to deflect noise.
- ➢ Noise from other rooms in the house. This could be through walls and/or the ceiling. This can be reduced by installing additional insulation in the ceiling. (Always take care that downlights in ceilings are adequately protected so that they don't set the insulation on fire.) Investigating whether insulation can be pumped into wall cavities. Adding an extra skin onto the dividing walls with insulation between it and the existing wall. Building in baffle walls in the ceiling between the rooms. Introducing carpets in the rooms to deaden sound.
- ➢ Noise from the activities on the floor above. These can be reduced by installing carpets to the floor above to deaden footsteps. Installing a suspended insulated ceiling to the rooms impacted by noise from above.

Summary

You could be looking at moving because your current home doesn't appear right for you. It's unappealing, small, shabby and items are broken. Yet, with a little imagination and effort maybe the house can be vastly improved at a relatively modest cost. But, even incorporating some of these

ideas into your new house or renovation can improve it immensely. So consider some of these home improvement ideas.

- ➢ Add additional storage and improve the cupboard layout to maximise storage.
- ➢ Lighten and brighten your house. Even change furniture.
- ➢ Install new lights.
- ➢ Add new cornices.
- ➢ Fit nice skirtings.
- ➢ Change the door and cupboard handles. Even consider a new front door.
- ➢ Fit new carpets.
- ➢ Install new blinds or curtains.
- ➢ Improve and tidy the garden.
- ➢ If noise is a problem, improve the soundproofing.
- ➢ Add or improve the outdoor living areas.
- ➢ Fix what's broken.

Understand what you don't like about your house and why, then see how it can be fixed. Renovations don't have to be major and involve enormous expense. Even small changes can increase the value of your house and improve your enjoyment of it.

Over the years we've bought several investment properties. To make them more appealing we've repainted them in light colours, installed new lights in some rooms, sometimes changed tap and shower fixtures, added ceiling fans, done maintenance, improved the garden by adding a few simple plants and covering the planting areas with mulch, and cleaned the house – all at a relatively small cost and a few days' work. The houses and apartments immediately looked lighter, brighter and more attractive and we've always easily found tenants.

Conclusion

Your house is one of the biggest financial investment that you'll make. You'll have to live with many of the features of the house which can't easily be changed for many years. So it's important to get the design, location and construction right.

Before starting on your construction adventure it's important to understand your limits – your financial limits, your physical limits, your time limits and limits regarding your construction knowledge and experience. Knowing these you will be better prepared to select the best options for designing and constructing your house. Getting in over your head will cost more money when you have to hire a professional to help out.

It's important not to embark on renovating your home or buying a property on a whim, simply because you want a change, or because you don't like your current home. You first need to decide what you would like, what you need, what you can afford, and importantly what your partner wants. Also understand what you don't like and what you want to change in your current home. Far to often people embark on expensive home renovation projects which are a waste of money, sometimes projects that don't satisfy them. From time to time renovating and changing your current home will never give you the desired outcome, which might be because you're changing the wrong things, or because the things that should be changed can't be easily altered, so the bad features remain. Regrettably some renovations end in a mishmash of styles, a poorly connected house and a house that looks amateurish, leading perhaps to the house decreasing in value or certainly not recovering the renovation costs. Then there are some renovations and buildings which are of poor quality, possibly even being unsafe for the occupants. Often though, small changes and improvements can improve many homes, making them more liveable and improving their value hugely for only a modest cost and small effort, without going through a costly major renovation project. So it's vital to have an overall masterplan for your renovation project so there's a cohesive style and a satisfying outcome when it's all complete.

Of course if you are set on building a new house make sure that you get the design right. A design that delivers a comfortable and safe home for

you and your family without being unnecessarily expensive to build, and a home that will be easy to maintain without high ongoing costs. A design that ensures there aren't continuing problems of leaks, blocked drains, damp and more. A no fuss house which suits your family's lifestyle. A home that can be easily adapted to your family's changing needs.

But it's pointless building your dream home in the wrong location, an area that's noisy, busy, unsafe, or one with other drawbacks. Of course the right property should be a property that's relatively easy to build on, or at least a property where you understand the issues that will impact your design and the construction costs. Take your time to pick the right property, the right property for you and your family. Buying the right property will be a valuable investment which will undoubtedly reward you when the time comes to sell. But buying the wrong property will be a very expensive mistake which you may have to live with for many years.

If you're building and renovating a house as an investment, to sell at a profit, or to rent or lease, then understand what prospective buyers or tenants are looking for. Know what's available in the market and what additional supply will be added in the next few years. Understand your costs and compare them to the income or return that you'll get from renting or selling a property with those features in that location. What will make your house stand out from others? Costs are always important, but never cut costs such that nobody will want to rent or buy the finished house.

You can ensure the success of your home project by:

- ➢ Knowing what you want and what you need. Understand what are 'must haves' and what are 'would like to haves'. Equally know what you don't want, don't like, or don't need.
- ➢ Knowing what you can afford.
- ➢ Gathering ideas by looking at home magazines, visiting display homes, houses for sale and product showrooms (such as kitchens, lights, tiles, bath ware and flooring displays).
- ➢ Preparing a budget. This budget must be realistic and it should have a contingency. It must include all the costs. Regularly update the budget as new information comes available and as costs are incurred.
- ➢ Working with your partner to see that the house will be one that you both like. Be prepared to listen, understand, and where necessary

compromise, while ensuring that you aren't both making so many compromises that you end up with a house that neither of you like.

- ➢ Being prepared to stop the project if you find your expectations can't be realised, or that you can't afford the project.
- ➢ Always being prepared to consider alternatives. Never be too set in your ways, or too proud to change your mind.
- ➢ Getting advice when necessary.
- ➢ Employing experts to help when necessary.
- ➢ Carefully selecting the property, considering your and your family's requirements. Research the property and the surroundings. Understand what's going to be impacting the neighbourhood in the future. Ensure that you're not going to encounter additional construction costs because of the property, or if you are that you factor these into your budget. Always buy a property that fits your budget. There will be another property so don't be rushed to commit to a property that's going to be difficult and expensive to build on. Don't be fixed on buying into a neighbourhood that's the 'in place', a suburb you're familiar with, or because it's really close to work, if you're going to be paying a premium to be there. Rather be flexible and cast your search net a bit wider – you may find that your money can buy a far better property elsewhere.
- ➢ If you planning on building on an existing property you own, or renovating an existing house, then understanding the area and the characteristics of the property before embarking on an expensive build which you might ultimately not like because you don't really like the property, or the build is more expensive because of the difficulties of working on the property.
- ➢ Understanding the property restrictions such as zoning, access, heritage and setbacks, and ensure that you know what impact the local and the estate regulations will have on your house plans.
- ➢ Selecting a designer (architect and engineer) that has designed similar projects to what you're looking for.
- ➢ Ensuring the designer understands your needs. Know that you will be comfortable working with them.
- ➢ Designing a home that suits your needs, that's practical and satisfies the codes and specifications, and importantly, fits your budget. Get the big things right that are difficult to change later, such as room

sizes, kitchen layouts, etc. If you can't afford to include the second bathroom, another bedroom or garages now, then plan the house so that they can easily be added later. That includes designing the floorplan layout and the roof so the house can easily be extended, and positioning the house on the property to allow for the expansion. If budgets are a constraint, save money on items which can easily be upgraded later.

- ➢ Carefully reviewing the design to see that it includes everything you require and hasn't added stuff which you don't really need and which will cost you additional money.
- ➢ Ensuring that you have reasonable and attainable expectations in terms of the time, costs, aesthetics and the finished result.
- ➢ If you're doing the construction work yourself, working safely, have a master plan of what you want to achieve, how you're going to do things and the order that everything must be done. Be willing to call for expert advice and help. Never take shortcuts.
- ➢ Not selecting your contractor based on price alone. Investigate your contractor, checking that they're reliable and can produce the quality home you're looking for. Ensure that you've provided the contractor with all the information they need to price the project. Then carefully check and review the prices to ensure everything has been priced and that there are no traps or pitfalls. Then appoint the contractor using a legally binding contract which contains all the project terms and conditions.
- ➢ Understanding how your decisions, or lack of decisions can impact the progress and cost of the project. Resist the temptation to make changes as construction progresses.
- ➢ If required, appointing a clerk of works to check the quality.
- ➢ Regularly checking the works to ensure that the contractor is working safely, they're keeping the site tidy, the quality is acceptable, nothing has been left out, and that they're progressing according to the construction schedule.
- ➢ Knowing what needs to be done before you can move into the house.
- ➢ Ensuring that the contractor has completed all items in their scope when the project is finished. Prepare a snag or punch list of all the defects and unfinished items when the contractor is ready. Once

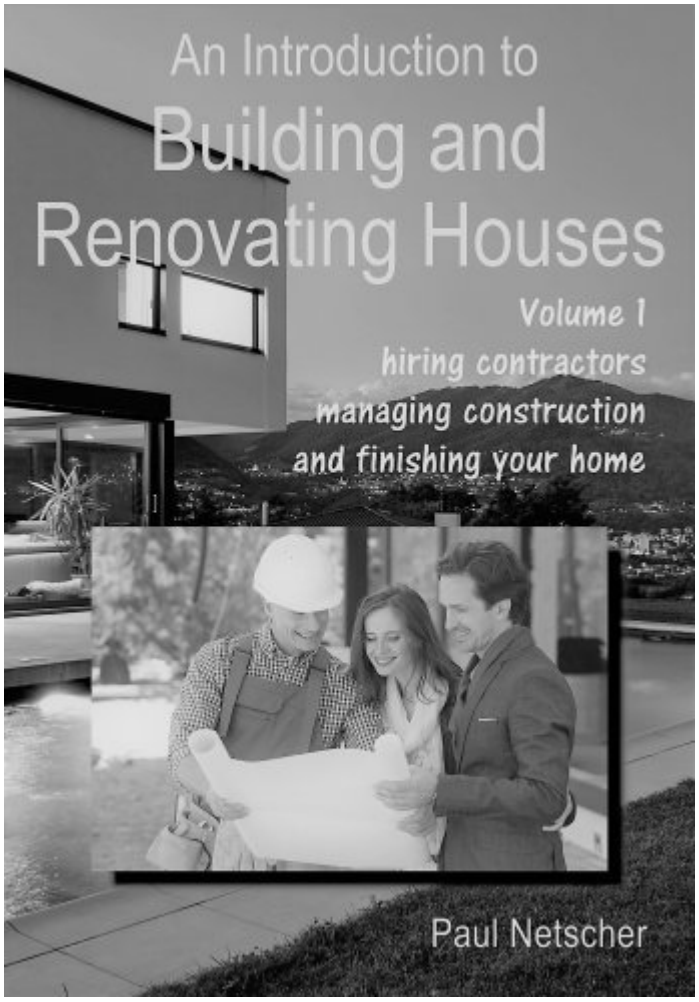
the contractor has completed all the remedial work check that it has been completed satisfactorily. Check that the worksite has been cleaned and returned to the condition it should be.

➢ Understanding your rights and your obligations in the process.

Building or renovating a house can be daunting, but I hope that I've armed you with the knowledge to dodge most of the pitfalls and dangers of purchasing a property, renovating a house and designing your home. The next challenge is to ensure that the construction or renovation process is a success. You don't want your dream home spoilt by shoddy construction, nor do you want to be caught by a shonky builder who takes for ever to complete your project, possibly even leaving it unfinished. Of course you definitely don't want to pay more for your house than you should. In my book *'An Introduction to Building and Renovating Houses – Volume 1, Finding Contractors, Managing Them and Finishing Your Home'* I discuss the different parties in a construction project and how they can help you. I look at the different ways you can construct your house, including doing all the work yourself, appointing a number of different subcontractors and managing them, using one contractor to do all the work, having a project manager to manage the construction process, and a number of options in between. How you manage and build your project will depend on your time, your abilities and your finance. I also discusses a number of common construction processes and pitfalls to avoid. There's a chapter on selecting your contractor, another on managing your contractors and a chapter on what you need to know to finish your project successfully. I briefly discuss what to consider when doing the work yourself. I also consider legal and contractual aspects. Lastly I discuss some common problems encountered on construction projects and how you can ensure that your new home doesn't suffer from them.

I hope that I've opened your eyes to the numerous possibilities for your new house. Good luck with your project. May you and your family enjoy many happy years in your new home.

Visit www.pn-projectmanagement.com for more home building advice.



For more valuable information on building and renovating houses read 'Volume 1 – hiring contractors, managing construction and finishing your home'.

Glossary

Construction and property terminologies vary between different countries and even companies. The descriptions below relate more to their meaning within the book and aren't necessarily their official descriptions.

Access – how you get to your house and how your vehicle goes from the road to the garage. Also, the contractor needs to reach the work areas and be able to work there. Access to the work area must be provided to the contractor in the condition specified in the contract document so they can do their work.

Aesthetics – what the finished house looks like. Could be interpreted as beauty versus ugly. Something what is aesthetically pleasing to one person may not be aesthetically pleasing to another. This is particularly a problem with modern architecture which some could object to, while others think the building is beautiful. Some estates and cities may restrict buildings that don't fit particular aesthetic guidelines. Blemishes on the finished product, such as mismatched tiles, colour variations, poor workmanship and visible patches can mar the aesthetics (look) of the finished product.

Air-conditioning (HVAC) – is equipment used to cool air down and then circulate the cool air into a room. Reverse cycle air-conditioning also heats rooms.

Appliances – could be dishwashers, clothes washers and dryers, fridges, freezers, etc.

Approval (permission) **–** constructing a new house or renovating an existing house usually require approvals from various authorities. These approvals could include approving the drawings as well as stages of the completed work.

Architect – a person that plans and designs a building, including preparing construction drawings. They could also be employed to manage the construction process. Usually architects require a qualification and a license to operate in the region.

Architectural style – are a series of features and details, coupled with the overall form, which identifies a house with a particular

style. There are many recognised architectural styles with most being related to historical periods or to countries. So you could have Greek, Japanese or Spanish styles, or Victorian, Modern, Art Deco, etc.

As-built drawings – are drawings showing the exact location and size of the finished structures and positions of utility lines. Where the construction drawings haven't been deviated from then these drawings could be used for the as-built drawings.

Authorities – used generally to define city, town, county, or state and country government agencies.

Balustrade – a railing supported by columns to prevent people falling from a terrace, balcony or staircase. The area beneath the railing is filled with decorative panels, glass, railings, etc, which have spacing small enough to prevent children from squeezing through gaps. Children shouldn't be able to easily climb over balustrades.

Basement (cellar) – that part of the house below ground level. Usually the ground is at least threequarters (usually more) the height of the rooms on all sides of a basement.

Basin (washbasin, sink or washbowl) – place for washing hands in a bathroom.

Bathroom – room in the house specifically for toilets, showers and bathtubs.

Bay window – a window that projects outwards from the walls of the house.

Bearing wall (loadbearing wall) – a wall that supports a load above (usually an upper floor or the roof) in addition to its own weight.

Bonds (surety) **–** a form of guarantee issued by a bank or insurance company to insure you (up to a specified value) should the contractor fail to fulfil their obligations as detailed in the contract.

Bricks – small rectangular blocks used to construct walls. These could be clay or cement and could be solid or hollow. They come in various sizes depending on the manufacturing process and are also in different strengths. So an engineering brick is typically stronger and can be used in foundations and to

support an upper storey. Face bricks are clay bricks which are designed to be exposed. Face brick walls can be decorative and they require no painting or render.

Budget – an estimate of income and expenditure (costs).

Build (construct) – complete any portion of your house.

Building lines (setbacks) – a portion of your property, measured from the boundary, where you cannot construct your house. Usually measured as the horizontal distance from the front, rear and sides of the property boundary. These are stipulated in building codes, property zoning regulations, property title deeds or in housing estate rules.

Building plans (drawings, blueprints) – schematic representation of the house and property.

Bylaws – regulation made by a local authority or housing estate.

Caveat – a document that a person or company can lodge claiming title to a portion of your property. The caveat is kept with the title deed. So a utility company could have a caveat for a portion of a property which prevents structures being constructed on that portion. They may have a utility pipe in this area or could install one at a later date. Your neighbours may have negotiated a right of way (access) through your property. Members of the public may have right of way to walk across your property to reach a beach or lake.

Ceilings – the upper interior portion of a room, usually constructed of gypsum board or timber. It could be level, or follow the profile of a sloping roof – like a church. It generally hides the roof structure and the utilities fixed in the roof space.

Codes – are a uniform set of mandatory technical provisions for the design and construction of buildings and other structures. These can be national codes, state codes, or even codes applicable to a city or region, and usually the structure must comply with the most stringent applicable code.

Construction drawings – the drawings required by the contractor to enable them to construct the project.

Construction – the physical work of building, renovating or constructing a house.

Construction schedule (construction program/programme) **–** the depiction of the activities required to construct a house, showing their duration, the inter-relationship with other activities, their order, and when the activities are planned to start and be complete. It's used to measure progress, adjudicate any extension of time claims, and if necessary, to quantify the amount of the liquidated damages.

Constructability (buildability) – the ease and efficiency that the house can be constructed, which usually reduces construction costs as well as the time required for construction

Contract – is the agreement between you and the contractor setting out the scope of the project, the price, milestone dates, the terms and conditions of the agreement as well as the obligations and rights of the contracting parties.

Contractor (builder) **–** a company that constructs a house, or a portion of the house.

Cornice – a decorative horizontal trim at the intersection of the walls and the ceiling.

Covenants – is a restriction on what you can build on your property, or where you can build.

Cupboard (closet, cabinet) – usually a piece of furniture with shelves (and sometimes rails) for storing clothes, crockery, etc. For this purpose I've used it to define cupboards built into the house. They may have doors.

Demolition – the act of breaking down part or all of the structure. It could involve breaking an opening in a wall for a window, chopping up floor tiles, removing part of the roof or bashing down walls.

Designer – architect or engineer that designs the structures and house.

Double volume – an area of the house where the ceiling is around twice the height of the ceiling in the rest of the house. Often used in double storey houses where part of the upper floor doesn't extend completely over the lower level, but the roof does.

Downpipe (downspout) – vertical pipe that carries water from the roof to the ground.

Drawings (plans, blueprints) – are the graphic representations of the property, house and other structures.

Driveway – the road or paving that connects the house to the public road. Designed for vehicles and constructed of compacted ground, concrete, surfaced with asphalt or various paving blocks.

Ducts – round or rectangular pipes that deliver air to and from an air-conditioning unit. Ducts could also be hollow cavities in walls where pipes and air-conditioning ducts are positioned where they are hidden from view.

Earthworks (ground works) – all work involving excavating, filling and levelling the ground (earth or soil) on the project. Also excavating for pools, basements, foundations and utility trenches and refilling them as required.

Eaves – the lowest portion of the roof overhanging the house walls.

Engineer – designer of elements of the building, such as the structure, air-conditioning and stormwater. Usually required to be registered.

Estate (housing estate) **–** is an area of land set aside for a specific use, often with specific guidelines and rules, sometimes with their own governing body or authority.

Flashing – thin pieces of material, usually metal, designed to seal the gap where the roof joins to chimneys and walls, where pipes penetrate the roof, and to join two pieces of roof together that intersect at an angle. The flashing often takes an L-shape, with one leg of the angle sliding under the roof covering and the other leg being securely fixed to the chimney or wall above the surface of the roof, thus forming a channel for the water to flow away. Flashings can be cut and bent to suit specific roof junctions and shapes.

Fill (backfill, filling) – ground, soil, earth, used to fill holes, trenches, under buildings and to level an area. The ground usually has to be compacted in layers so that it is firm and doesn’t settle when it’s wet or loads are placed on it.

Finishes – generally taken to mean the non-structural elements of the building that provides the building it’s finished aesthetics. The finishes may include carpets, floor and wall tiles, the render

(plaster) on the walls and the type of ceiling. It could include the type of fixtures, such as, bathtubs, washbasins, tapware and lights. A garage could have minimal finishes with bare concrete floors and walls and industrial lights, while a bathroom could have expensive finishes which could include marble floor and wall tiles. The type of finishes can add hugely to the cost of a building.

Fixtures – light fixtures, built in cupboards (cabinets), sinks, taps, basins, toilets, bathtubs, etc.

Flue (chimney)– a duct for smoke and gases created by a fire or gas heater to exit the room.

Foundation – the lower portion of the building that connects the building to the ground, supporting the weight of the house and anchoring it to the ground.

Gable end – the triangular wall at the end of a ridged roof.

Garage – secured covered area where vehicles are stored.

Garden – used to describe the portion of your property outside the house. This could consist of patios, driveways and swimming pool, but generally is the area covered by plants, trees and lawn (grass).

Green buildings – are buildings specifically designed and constructed to be sustainable and environmentally friendly. This is achieved by them being resource efficient (which is limiting the amount of energy and water required to operate and construct the house), using recycled materials and materials which can be recycled, and limiting the impact of the house on the environment while you living there, as well as in the construction phase.

Ground (soil, earth, dirt) – material which can easily be excavated, usually consisting of sand and sometimes including stones and small rocks. This material can also be levelled and compacted to fill holes and trenches, or to create level areas where the house can be constructed.

Gutter – the channel to collect water running off the roof.

Heaving clay – some clay will expand when it’s wet and then shrink when it dries out. This causes the ground to move, which can

break pipes in the ground and cause house foundations to move, often unevenly, resulting in cracking of the building.

Heritage buildings – are buildings that have been declared to have cultural or historical importance. Sometimes whole precincts are declared to be heritage protected. Heritage buildings are usually protected (listed), often meaning that they can't be changed, and when any work is done on the building the new materials and workmanship must match the existing building, or comply with strict guidelines. There are often different levels of heritage protection which dictate what can and can't be done to the building.

Infrastructure – could be public roads, highways, railways, power lines, stormwater drainage, power cables, gas lines, telecommunication cables, sewer pipes and water pipes supplying the area, city or town.

Inspections – records that work meets the specifications and quality requirements. Inspections could be done by the contractor, you or your representative, or by representatives of local authorities, utility providers or banks.

Instruction (Site Instruction) – is a contractual request made by you or your representative directed at the contractor. Instructions often cause the project to be varied and may result in a variation claim.

Insulation – preventing the movement of heat or cold through a roof, floor or wall. Can also be used for sound insulation.

Investment property – a house or apartment which is used for investment purposes. Either the property is rented, leased or let to tenants who pay rent. Or a new house is constructed, or an existing house is repaired and renovated and then, hopefully, sold at a profit.

Joint – The junction of adjacent surfaces. In some cases a joint is specially formed in walls or floors to allow independent movement without causing cracking.

Landscaping – the process of making a garden, including shaping the ground.

Land survey – checking the physical position and elevations on the property and plotting these on a drawing. It could also be the

act of marking out what's on drawings physically on the ground. So for instance, marking the position of the property boundary and the position of where structures must be constructed.

Levelling the site – flattening the area so that the house can be constructed, usually by excavating high areas to remove material and filling lower areas. This could involve making areas perfectly level and even compacting the ground.

Lights (light fixture, luminaire) – an assembly that contains the light.

Maintenance – to repair damages and faults as well as undertaking preventative maintenance, such as servicing equipment, and painting and cleaning the building.

Master bedroom (main bedroom) – principle bedroom, or parent's bedroom.

Materials – all items permanently incorporated into the works. This may include concrete, reinforcing, timber, bricks, glass, etc.

Neighbours – could be people or companies located immediately adjacent to your house, as well as those in the immediate area.

Orientation – the direction your house faces.

Patio – paved outdoor area. Floor finishes could be timber, concrete, tiles, paving stones, etc. May have a roof covering.

Paving – referring to an outdoor hard surface to driveways and patios. Paving may be bricks (clay or concrete), concrete paving stones, asphalt or natural stone.

Pergola – covering over an outdoor area. The covering could be a timber or steel frame to support climbing vines and creepers, or it could be a roof of thatch, polycarbonate or tin. Some pergolas have roof panels which can be opened and closed to keep the rain out.

Permits – are documents that officially allow the receiver of the permit to carry out the action stated on the permit, often subject to conditions and constraints attached to the permit. There may be a number of permits required for a construction project and these may be issued by different departments and agencies.

Pitched roof – sloped roof.

Principle agent – is a person delegated the responsibility of representing your interests. Often the architect or engineer is appointed the principle agent and their duties usually include project managing the construction work, assessing the contractor's variation claims and payment claims, and ensuring that the construction work is delivered on time, safely and meets the quality standards and specifications.

Project manager – is the person (or company) appointed to manage the project for the owner (you). Often the contractor's person responsible for managing their portion of the construction work is also called the project manager (or construction manager, site manager or site agent). However, these two project managers fill two distinct roles in the project, with the one representing you and the other the contractor.

Property (lot, block, land) – the land that you own where your house is, or where your new house will be constructed.

Quality – the properties of the product supplied to you, defined by the requirements in the contract document, specifications and drawings, which may include the visual appearance, as well as the strength and durability.

Render (plaster) – a composition of sand, water and cement, or of lime or gypsum and water, which is spread over walls or ceilings to create a smooth, or a textured, finish that's uniform and even and covers the underlying surface, which could be bricks or gypsum boards.

Renovations (remodelling) – the act of changing an existing house or structure to increase its size, change its use, or improve it to better suit your needs. Renovations could be as simple as repainting the house or involve partly demolishing and extending the house.

Right of way – allows others to travel over your property, usually to get to their property which is inaccessible by other means. Sometimes a right of way is granted to the public to cross the property, for instance for a walking path to the beach.

Riser – the vertical height between steps.

Rock – ground that is hard and can only be excavated using mechanical means or with explosives. The rock may be solid

or could be fractured (cracked).

Schedule (often referred to as a programme, program, bar chart or Gantt chart) **–** a graphic representation of the timetable needed to complete the project, showing the sequencing, inter relationship and duration of the various project tasks and activities.

Scope of work – the work which the contractor is contracted to do. The scope normally takes the form of a written description of the work contained within the contract document.

Screed – usually a sand and cement mixture placed onto a concrete slab to make it level, to raise a floor to a desired height, or to create a slope towards a drain or low point.

Septic tank – are underground chambers of PVC, concrete or other materials. Household sewage flows into the tank where it's broken down by bacteria. The treated effluent fluid flows from the tank into a French drain where it is allowed to seep into the ground. Periodically the sludge that accumulates in the tank must be pumped out and disposed by specialist contractors. Usually licenses are required to install septic tanks.

Services (utilities) **–** water, power, gas, telephones, sewer and data cables, ducts and pipes.

Servitudes (easement) – a portion of the property which can be used by others, such as for installing utility cables and pipes. The easement or servitude should be in the title deeds or on the property plans.

Set-back (building line) **–** A prescribed distance that a building must not be closer to the property boundary. This amount is usually dictated by the local authorities and the zoning of the property. In some instances it's part of the conditions of building on the property dictated by estate rules. The set-back could vary depending on the height of the building and the set-back could vary for different floor levels or heights of the building.

Setting-out information – information to position a structure in the horizontal plan and the vertical plane. Often given as X and Y coordinates and an elevation or Z coordinate. Could also be a measurement, height and direction from an existing structure or a known fixed point.

Sewer pipes (wastewater pipes) – pipes that take the wastewater from toilets, sinks, bathtubs, basins and showers to the town wastewater (sewage) system, or to a septic tank.

Shop drawings – drawings produced (normally by the contractor, their suppliers or subcontractors) to show the details of an item that they have to fabricate.

Sill – the bottom portion of the window.

Sink (basin or washbowl) – place to wash plates and pots in the kitchen.

Site (project site) – the area where construction takes place.

Slabs (concrete slab) – concrete structural element forming the floor on the ground level, and the floor between the different levels in the house.

Skirtings – a board running around the base of an internal wall. It finishes the joint between floor and wall, protects the wall from knocks and it can provide a decorative feature. It can be of timber, PVC or tile.

Soil (ground, earth, dirt) – material used to fill holes and against foundations and under floor slabs.

Specifications – definitions and requirements of the materials, processes, quality, products and systems to be used in the house.

Storey (story, floor, level) – the number of floor levels above the lowest level. A house that has a ground floor and an upstairs level is two storeys, while a house with three floors or levels would be three storeys high.

Subcontractor – a contractor employed by a contractor to do a portion of their works.

Survey (construction survey) – used here to set out structures and to plot the position of structures, site boundaries and other relevant items, locating them on plan and elevation. However, preconstruction survey is used to record the condition of existing structures.

Tiles – a manufactured hard waring product of ceramic, cement, stone (such as granite, marble) and glass used to cover floors and walls. They can be square or rectangular and range in size from mosaics to tiles of six hundred by three hundred millimetres

(two feet by one foot). Roofs are often covered by cement, clay or wood tiles.

Topography – the slope of the property.

Topsoil – uppermost layer of soil which usually contains vegetation and nutrients. Topsoil is a valuable commodity essential for most plants to grow.

Tread (going) – horizontal part of a step.

Utilities (services) **–** water, gas, electricity, telecommunications cables. Also used here to include sewer pipes.

Valley (roof valley) – the V created where two sloping roofs meet.

Vanity (bathroom vanity) – the combination of the bathroom handbasin and the surrounds, which is normally a shelf holding the basin plus creating storage around and often under the basin. The top surface, or slab, is usually made of natural stone, concrete, timber, or tiles. It must be water resistant to withstand regular splashing.

Veranda – usually an extension to the roof creating a covered outdoor area, or simply to shade the windows of the house.

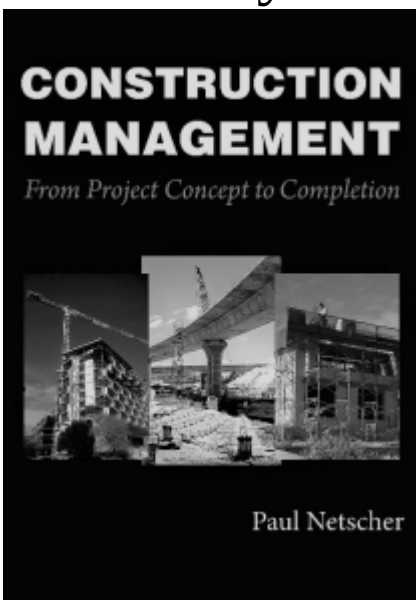
Waterproofing – the process of making a wall, floor or roof impermeable to water. Waterproofing can be an impermeable material such as PVC sheeting, tar paper, or a bituminous paint applied to the surface.

Water table – the level of water in the ground below the surface.

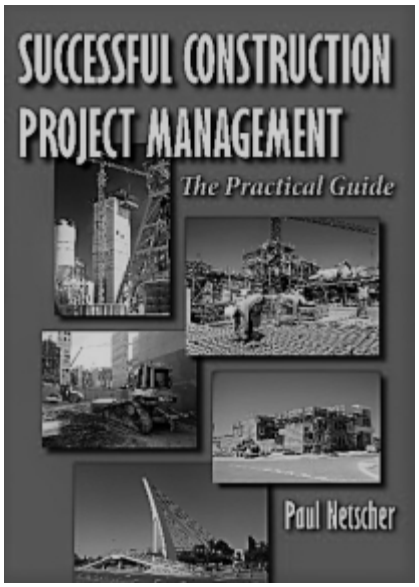
Window dressings – curtains, blinds or shutters.

Zoning – areas of land (properties) are divided by authorities into zones within which various uses are permitted. These zones may also dictate the minimum size of the property. So for instance, we could have land zoned for industrial use, commercial use, residential and apartments. From time to time the authorities may revise the zoning, changing the land use and revising the property density. Zoning laws may also dictate the size and height of the house, the type of structure and how close the buildings can be from the property boundaries.

Other books by Paul Netscher



Construction Management: From Project Concept to Completion
Better than most construction books recommend highly. (review on Amazon)



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