Design Guide for Building 2010

Chapter 1

Purpose

The purpose of this design guide is to provide the format, the information, and the guidance for an individual or family to fully participate in the design of their new home. With the help of this guide, the user will be able to design a new home and provide the information necessary for a draftsperson to draw final working plans. This guide can help you design the house that you really want and can also save you money.

It is our belief that no matter how many stock house plans you have to choose from, changes to the final house design will inevitably be made. Because of the increasing necessity of accurate, fully-defined, final working plans, we have developed this guide to help you make all your design decisions and changes before the final working plans are drawn. Accurate, final working plans which depict the finished “as built” product, are necessary to satisfy lenders and permitting agencies, and to accurately predict the cost of your project.

Following the procedures set up in this guide, the user will be able to make all the critical design decisions necessary to make a home completely successful. Those design decisions can become the basis for your final working plans. Eliminating the need for costly changes after building has begun.

By using this guide as an aid in designing your home, you can possibly save thousands of dollars in architectural or design fees. Because there are no financial pressures to make decisions quickly or to stick to decisions already made, you have flexibility to consider more alternatives are receive input from all your family members.

In this guide we will discuss details and specifications. It is not the purpose of this guide to help you make final, finish detail decisions. It is our purpose to help you design the

physical spaces of your house and to point out the many finishing detail decisions that you will have to ultimately make when building or remodeling a house. It is our further goal to make you ask yourself the right questions about the needs and preferences of your family as they relate to home design.

We believe successful home design is an exercise, first of asking appropriate questions, and second, of answering questions appropriately.

A supplement to this Design Guide (The Traditional Home Series) contains 56 home designs; each with an alternative floor plan. For some people a home can simply be chosen from one of our stock designs. For others our stock plans are merely sets of ideas and guidelines to aid in the design process.

For those of you in the latter categories, we will provide the information and techniques to use with the plans, work spaces, and components found in this guide. This will allow you to produce an accurate scaled "drawing" of your design.

In either case:

We hope you find this guide helpful and are able to find or design or remodel a home that will successfully accommodate the needs and dreams of your family.

Chapter 2

The decision to buy an existing house or to design and build a new one once a geographic area has been decided has always been complicated.

Designing and building a new home has inherent advantages directly due to its newness.

Traditional arguments in favor of buying an existing house have been:

1. Immediate occupancy
2. What you see is what you get
3. Neighborhood clearly defined
4. The price is right
5. "We can always add on"
6. "We can always remodel"
7. "We can always resell"

There are a few factors today to consider that increase the complexity of this decision. Our "To Buy or to Build" discussion will focus on these new factors.

BUILDING CODE CHANGES

While it is true that buying an existing home can lead to immediate occupancy in an established neighborhood, if that house is an "older" existing house, research should be done to determine if the home complies with local and state codes.

When buying an older house, code complicity with the flowing systems should be checked by a professional:

1. Structural (Footings, foundation, and framing)
2. Electric
3. Plumbing
4. Sewer disposal
5. Insulation
6. Smoke and fire detection and fire suppression
7. Access and Egress
8. Fire access and egress
9. Ventilation
10. Fenestration
11. Appliances

Deficiencies will likely be found in an older building. If deficiencies are found, the local building officials and inspectors should be contacted to determine your future responsibility for correcting these deficiencies.

In most cases, homes with deficiencies are allowed to remain in the pre-existing condition of non compliance. Some areas in the country, however, have adopted regulations that require code updates on some systems upon transfer of title.

Some areas require complete code compliance before a permit will be granted for an addition or remodeling. In areas where sub-surface septic disposal systems are used, replacement of a failed system may be necessary to meet new regulations.

ZONING CHANGES

Compliance with all zoning regulations should also be checked. Lot sizes, set backs, and permitted uses may have changed since the house was built. This might restrict the size of an addition that legally could be added onto the house, or may restrict the number of bedrooms you are allowed to build into a house on the lot. That barn may be cute, but you may no longer be able to keep horses there.

HAZARDOUS WASTE

When considering the purchase of an older existing home, the property should be checked for hazardous waste and contamination.

A simple, buried 275 gallon oil tank that is not removed before title transfer could result in a great unexpected expense later on. Your local real estate broker, banker, insurance agent, or building inspector can help you with this concern.

PAYMENT OF MAJOR REPAIRS

When designing and building a new home all necessary items are included in mortgage considerations. This provides a predictable monthly expense.

When buying an older, existing home a major repair or system replacement because of code changes, zoning changes, or health hazards is almost a certainty. The expense of this repair or replacement could be considerable. This could result in an inconvenient out-of-pocket expense or the expense of refinancing.

Purchase a home for demolition

In some areas desirable land may be scarce. Older underdeveloped homes are often available and can be demolished to create a clear building lot. This option has advantages and costs associated with it. Because of the many complications involved in this approach it is best to work with a professional. We will be more than happy to provide advise for this approach and would be happy to show you examples.

Chapter 3

How to Use this Guide

Most of the information provided in this guide is self-explanatory. Some explanation is needed, however, to take full advantage of all the features this guide has to offer.
The house designs in the supplement have been divided into eight different series. These divisions are not intended to be the lost word in historic building classification, but to be a simple and practical classification of some of the more popular building styles used today.

This series of houses was chosen because we feel that we are in an era of value oriented house design. People are serious about their homes as a place to live and raise a family and, as an investment. As banking appraisals become more conservative, financed houses will have less fluff and more substance. Sound, high quality physical structures, efficient interior layouts and efficient systems are stressed when building today.

We believe the houses in this series and modifications of these houses can be built to integrate the needs of the families building today with the concerns of the banking and appraisal institutions.

The design process can begin with whatever part of the house you would like, but we will discuss a logical order in which to proceed in a later section.

After a general design of the house or addition is chosen and after creating a floor plan you must decide on general specifications. The general specifications of your house should cover all aspects of your project and should be completely understood by you and your builder.

We have included a sample general specification document for you to examine. This document can be modified to reflect your personal specifications and local requirements.

After the design and specifications have been finalized, working plans must be drawn and a builder must be chosen. This will be discussed in later sections.

Chapter 4

Purchasing a Lot

What comes first, designing a house or purchasing a lot?

The answer to that question depends on your situation. Designing a house for a specific lot or finding the perfect lot for a specific house can be both challenging and rewarding. What is most important is understanding that there is a relationship between the house and the land. That relationship can be maximized for aesthetic, practical, and economic gain. If a building lot is being purchased with the intention of building soon, it would be helpful to have a basic idea of the type and size of house that will be built.

It is possible to build almost any house on almost any lot. However, if a house design has been decided, a lot compatible with that house design should be chosen. A properly matched house and lot will save money and provide more enjoyment for you and your family.

For example: a large ranch requires more flat level building area than a smaller two-story house. Site modifications to a sloping or rolling lot to build a large ranch could be costly. It would be better to purchase a flat level lot in this case.

However, if a walk-out basement is desired, a sloping lot would be the obvious choice.

If you already own a lot, and are designing a house to be built on that lot, allow the characteristics of that lot to influence the design.

For example: On a corner lot, the house could face the primary road and the attached garage could face the secondary road. A house could be designed to wrap around the lot following the radius of the cul-de-sac. If the lot affords appealing views it would be appropriate to design the house having a living room with a window-filled wall facing that view.

There are many factors other than house design to consider when choosing a piece of land on which to build a house. Some of the factors concern the lost specifically and some concern the area in general. A few specific lot considerations are:

1. Geographic location
2. Cost, financing, and insurance availability
3. Availability of electricity
4. Availability of water
5. Municipal or self-contained septic facility
6. Topography
7. Soil conditions

A few concerns about the area in general would be:

1. Educational facilities
2. Recreational facilities
3. Cultural facilities
4. Religious facilities
5. Social opportunities
6. Availability of transportation
7. Employment opportunities
8. Zoning regulations
9. Property tax values

After you have given some thought to the above considerations, it is time to start looking for a building lot. If you are unfamiliar with the area, a real estate agent is probably the best avenue for finding a lot. If you do not wish to spend a lot of time looking for a lot, a real estate agent is also helpful.

Buildable lots that are for sale can also be found through “for sale” signs along roads, through advertisements in local newspapers and magazines, through developers and builders, and through friends, co-workers, and word of mouth.

The single biggest factor in a lot purchase decision is usually cost. A decision must be made to allocate a certain amount of money for a lot purchase and a certain amount for construction. The ratio of these two numbers will vary in different parts of the country. Your banker or real estate agent can help in this area.

When judging the relative costs of one lot compared to another, determine the expense of site development on each lot necessary to provide the same level of services and support for your house.

Consider:

1. Heavily wooded lots require considerable clearing.

2. Rocks and ledge can require blasting.

3. A long driveway can be expensive.

4. Bringing in fill or removing fill can be expensive.

5. Poor soil drainage may require an expense to correct.

6. How far is electricity?

7. How deep is good water or, how expensive is the hook up to, municipal water lines?

What will be the expense for a sub surface septic system is municipal service is not available?

After finding a few lots that meet your financial requirements and some of your general requirements, it is time for a closer inspection.

Walk around the potential lots, drive around the neighborhoods, and talk to the neighbors. The more information obtained at this point, the fewer surprises you will have later on.

When you make your final decision, contact an attorney. Have a lawyer check all the legal aspects of the property. Again, this reduces surprises later on.

If everything checks out with the lawyer, you are ready to purchase the lot.

Decide if you are going to:

1. Pay cash for the land
2. Finance the land with the seller
3. Finance the land with a bank
4. Finance a land a house package with a bank

Another possibility as discussed above is to purchase a lot with an existing house with the intention of demolishing the existing building. All of the above considerations for a lot apply to this approach. One additional consideration not to be overlooked in this approach is the cost to properly dispose of the demolition material.

If you are financing a land and house package, the bank will want to see your house plans and specifications and a contract with your builder.

The following sections in this design guide will help you prepare that information.

Chapter 5

Construction Costs and Appraisals

For many people, the most important initial factor to consider when designing a house is cost. After determining a budget for the entire project and subtracting the cost of the land, a dollar value for actual construction can be determined.

The cost of the actual construction of your house will depend on may factors. The biggest factor will be the size of the house.

From a banker, real estate broker, insurance agent or builder obtain the average square foot cost for new construction in the area where you intend to build. Be sure to get a square foot cost for the first floor and the second floor as they are usually different. Also, check the difference between slab and foundation construction and which is more common in your area.

By dividing the amount of money available for building by the square foot building cost, you can determine the approximate size house you can afford.

At this time you should choose a preliminary house design of appropriate size and obtain rough estimates from a builders. This will allow you to determine if the chosen design and size are in your budget, before all the final details and specifications are worked out.

If the preliminary estimates are in line and you are happy with the initial design chosen, it is time to finalize the design and specifications.

It is necessary at this point, however, to discuss the appraisal procedures used by banks when evaluating your mortgage package. Banks have become conservative in their lending practices and should remain so throughout the decade.

This conservative nature will dictate the use of modest square foot prices when a bank is appraising a house on paper for mortgage purposes. The bank is not going to approve square foot building costs that are too high above the costs of similar houses in the same area. The concern is that with two similar sized houses, in most cases, the least expensive house will sell first.
With these cost factors in mind, the design process should include good quality, appropriate components and systems in a sensible, efficient, and economical layout. The series of houses in the supplement mentioned above were designed to produce modest square foot building costs.

Chapter 6

Style of House

The style of house chosen as a base when designing a house if more a matter of aesthetics than anything else. However, there are some non-aesthetic differences between the styles that we will discuss in this section.

The Ranch

The basic physical characteristics of a ranch are single-floor living spaces and low roof pitches. This style of house is the correct choice when it is necessary or desired that all living areas be on one floor. This is particularly important in cases of elderly, infirmed, or physically challenged occupants.

The Half Cape,
The Three-Quarter Cape,
The Full Cape

The basic physical characteristics of the Cape are a square or rectangular first floor, with a steep roof pitch (generally 9” to 12”) providing some second floor living space.

The Half Cape is characterized by a front entry door on one side and two symmetrically placed windows on the balance of the front.

The Three-Quarter Cape is characterized by a door surrounded by one window on one side and two windows on the other side. These windows are symmetrically placed.

The Full Cape is characterized by a center front door with two windows symmetrically placed on each side.

While the steep roof pitch of the capes provides some living space on the second floor, it is generally necessary to add either on or more single gabled dormers or a shed dormer to accommodate windows for light and ventilation.

Skylights can sometimes be used instead of dormers for light and ventilation. If you are attempting to authentically reproduce any of these traditional designs, skylights should only be used where they are not highly visible.

The Saltbox

The basic characteristics of the Saltbox are a square or rectangular first floor with a second floor and a steep pitch gable roof that extends to the first floor in the rear. This type of design provides more full height level ceiling area than is available in similar sized capes (before dormers are added). Dormers can also be added to the rear of saltboxes to increase living space or to provide light or ventilation. Skylights can also be added for this purpose.

The Gambrel

The basic characteristics of the Gambrel are a square or rectangular first floor, with a roof having two slopes on two sides with a steeper slope on the lower section. The Gambrel style again increases the amount of useable second floor area without using dormers. Dormers and skylights, however, can be added to further increase space, lighting, and ventilation.

The Colonial

The Colonial is characterized by a rectangular or square two story house with a shallow roof pitch (4” to 8”). This style house provides maximum available space on the second floor. It is not necessary to add dormers to this style house, but skylights can be added if desired.

The Bow Roof

The Bow Roof is basically a gable roof with is ballooned out a small amount to give the bowed effect. There are no special advantages to this style house and the construction of it can be more expensive than a house with a more conventional roof. This is the only style house in this series that is chosen for aesthetic considerations only.

The above house styles are featured in the plan supplement mentioned previously , however there are many other styles of homes including contemporaries, which can be explored. We will be happy to assist you in choosing a style appropriate for you .
If you are considering and addition or remodel it is our belief that the addition or remodel should incorporate all of the positive architectural elements in the existing structure and a plan should be developed that expands the original concept into a bigger integrated whole.

Chapter 7

Location and Orientation

Proper placement of a house on a lot is necessary to appropriately balance function and aesthetics with economic considerations. The best way to determine where the house should be located is to determine where the house cannot be placed. Because of legal, technical and physical restrictions, much of any lot can be excluded from placement consideration.

The factors to be considered when determining house location and orientation can be divided into the following categories:

1. Legal Characteristics
2. Physical Characteristics
3. Availability of Services
4. Aesthetic Considerations

With an accurate plot plan of you lot (prepared by a surveyor or an engineer if possible) areas to be removed from placement consideration can be marked off on the plot plan leaving a smaller area that will be called the “actual buildable area”.

We will follow this process of elimination through the four categories listed above.

LEGAL CHARACTERISICS

In most areas of the country there are local codes, ordinances, or zoning regulation that require any building to maintain minimum setbacks from rear, left, right, and front property lines, and minimum setbacks from roadways and easements. If you are near water or wetlands there most certainly will be additional setback requirements.

Setback information is available from your local building officials. Some restrictions may actually be in the title or deed to your property.

Find the setback requirements that apply to your situation and mark those areas off on your plot plan.

Other legal characteristics of you lot to consider in the design process are height restrictions and the percentage of site coverage.

In some situations (particularly in subdivisions) there are deed or title restrictions or restrictive covenants that may put further limitation on the actual buildable area. It is most important to respect these regulations, they may determine plan approval or title or deed conveyance. If applicable find these areas and mark them off on your plot plan.

PHYSICAL CHARACTERISTICS

The areas to be excluded from placement consideration in this section are not as clearly defined as those in the legal section; however, logical decision can be made to further reduce the area of the lot under consideration. In order to make the most of the ideas in this section, it is necessary to have a fairly good understanding of your lot. You should walk the lot, spend some time on the lot, and see the lot in as many different times of the year as possible. If time does not allow this, talk to the neighbors to determine seasonal influences.

When making decisions in this section it is necessary to consider economic as well as aesthetic factors.

For economic considerations, it is more desirable to build on a flat and level part of the lot that is high enough to be dry and low enough to be accessible. Building on a low part of the lot may require expensive site preparation to insure that the house and basement (if applicable) remain dry.

Since a long driveway can be expensive to construct and maintain, a house location closer to, rather than further away from the access road may make sense.

If some areas of the lot are heavily wooded or contain ledge, they can be removed from consideration in favor of other areas that require less expense to prepare.

In some cases it may be appropriate to eliminate an area that contains a particularly significant physical attribute. These could include an old or large tree, a large interesting rock, or rare vegetation. Some parts of your lot may provide habitats for wildlife that you may not wish to disturb. Blending the old with the new to provide a balanced and harmonic environment can be challenging and rewarding.

If you have found areas of your lot unbuildable because of considerations in this section, mark them off on your plot plan.

AVAILABILITY OF SERVICES

The final location of your house may be influence by the availability of electricity, water, and sewer. The may be economic as well as aesthetic considerations.

Is the electric service to your home going to be overhead or underground? Who is going to pay for the service to the house? What are the local, deed, or title restrictions for the electric service?

If electric service is only available on one side of the lot are you are responsible for bringing the service to the house, it might be appropriate to shift the house location to the side of the lot that is nearest to the available electric source. In some cases this decision can save thousands of dollars.

Is your water service going to be municipal or private?

If it is municipal, who pays for the installation of water lines and meters to your house? If you are paying for water line connections, it may be prudent to locate the house closer to, rather than further away from the water source.

If you will be installing a well on your property and the location has been predetermined, you may want to consider the expense of running water lines to the well when determining the house location.

The proximity to municipal septic lines or to the predetermined site of a subsurface disposal system, may also influence the location of you house on the lot.

If you have been able to eliminate areas of your lot from consideration in the section, block them off on your plot plan.

AESTHETIC CONSIDERATIONS

Aesthetic considerations are the most subjective of all the decision to make in designing your own home. They can overrule many other decisions if that is your choice. A decision influence by economic considerations can be changed by aesthetic considerations if you are willing and able to pay the additional expense.

The expense of placing your house at the highest point of your lot to take advantage of a specific view may be appropriate to meet the expectations of your family or to bring the lot to its highest or best use.

Sometimes the economic ramifications of your aesthetic considerations may be positive in the long run and other times it may be negative. It is necessary to consider all the possibilities. Cutting down a large number of trees may provide a nice yard, ball field, or view, but may also increase erosion or displace desirable fauna and flora.

One aesthetic consideration often overlooked is what things will look like in the future. Where are your neighbors likely to build? What other type of development might occur around your lot in the future? How high are the trees that you can now look over going to grow in several years?

Consider the aesthetic implication of all the house location decisions you have made. If those considerations have changed any of the other decisions made, change those areas on your plot plan.

ORIENTATION

At this point you should have defined the actual buildable area of your lot.

Now it is time to determine the actual location of the house. Make a paper footprint of your house at the same scale as your plot plan. Cut the footprint out with scissors or a craft knife. This “cut out” can be moved around the plot plan in the area you have defined as the buildable area.

Make sure there is room in your actual builable area to locate your house. If not, check your scales, change the house size, or review the areas you determined not to be part of your buildable area.

If you plan to expand your house in the future, of if you think it would be desirable for future owners of you house to expand the house, the land requirements for that expansion should be taken into consideration when determining a final house location. A typical example of this would be allowing room for the future addition of a garage.

Once the final physical parameters have been determined, it is time to determine the physical orientation of the house.

Which way should the house face? Should the house run parallel, perpendicular, or tangent to the road providing access to the house? Should the house face in the direction of the mountain, the valley, or the water? It is necessary to decide what is most important to you.

Is the relationship between the house and the road the compass points? Or is the view most important?

On a small lot with may other houses on the road, it may be more important that the house conform to the orientation of the other houses.

On a large lot away from other houses it would be more important to orient the house facing south to capture all the passive solar benefits possible.

On any lot with a significant view it would be appropriate to orient the house in favor of the view in order to maximize development of the lot.

With the correct lot and an appropriately designed house, it is often possible to orient your house to take advantage of all the above situations.

On your plot plan position your house "cut out" in the most desirable location. Draw in a driveway and parking area. Experiment with different arrangements that will accommodate the traffic flow patterns of your family and guests. Be sure to allow ample area for turning vehicles around.

Finalize the house, driveway and parking area locations and have them checked by your engineer or builder.

CHAPTER 8

In order to delineate all the design requirements of a house, it is necessary to determine the purpose of the house and the needs of the primary and/or secondary occupants of the house.

The purpose of a house will have a great influence on the design of the house

Is the house:

- Your dream house to live in forever?
- A house in which to raise your children?
- A retirement house?
- A vacation house?
- A vacation and rental house?
- Primarily and investment?

After the purpose of the house is understood, the needs of the occupants of the house as they relate to the purpose can be determined. These needs must be considered when defining design requirements.

After the approximate size of the house, the next design requirement is the number of bedrooms. How many people need their own bedroom? How many people can share a bedroom? Do you need a guest bedroom or is a pull out couch in the den or family room sufficient? Are your present bedroom requirements likely to change in the time that you

intend to occupy this home? Is an extra bedroom necessary or is a sleeping loft sufficient.

How many bathrooms are necessary to handle the number of people that will be regularly occupying the bedrooms designed into the home? How many bedrooms require private bathrooms? How many bedrooms can use shared bathrooms? Is the house spread out enough to warrant the addition of a half bath, or are the shared baths sufficient for general use?

What are your bedroom closet requirements? What are your linen closet requirements?

From the bedrooms and bathrooms we move to the kitchen. Designing a kitchen is often the most agonizing part of house design.

Do you want your kitchen to be a separate room? Do you want it completely open to the dining room or to the living room? Do you want to separate your kitchen from the rest of the house with a large wall opening, with a half wall, or with a breakfast counter or raised bar? Do you want a laundry area in the kitchen?

In the house designs in this guide we have shown many different kitchen layouts. In this component section we have also included many kitchen layouts.

With the individual kitchen components in the component section you can design your own kitchen.

If none of the above work for you, most building supply companies and most cabinet shops will design a kitchen for you. People specializing in kitchen design can show you many interesting custom options and the most recent developments and trends. Since a premium is often paid for custom products and innovation, it is wise to get ideas from a few different sources.

A standard rule of thrum for kitchen design is that, in addition to the basic appliances that you choose, 18 square feet of shelf space for basic storage, with an additional 6 square feet for each person usually served, is required. An average size kitchen has approximately 20 running feet of counter tops and equipment combined.

After deciding on the requirements for the bedrooms, bathrooms, and kitchen, the general use area requirements must be decided: living room, dining room, foyer, laundry, or library, etc. Finally, you must decide how to use the remaining space in your house. Do you need entry closets, pantry closets, and special equipment closets?

As you can see, this section asks many questions. But as we said earlier, one of the purposes of this guide is to help you ask yourself the right questions when trying to appropriately design your home. Designing a successful home is an exercise, first of asking appropriate questions and second, of answering questions appropriately.

Having decided the basic design requirements of your project, find a floor plan in this guide that meets or comes close to meeting those requirements. Change the plan as necessary, either by marking over a zoomed copy of a complete floor plan for minor changes, or by producing a new floor plan from a zoomed copy of a work space plan for major changes. Use the component, fixture, and furniture cutouts as necessary to experiment with many different plans and arrangements to find a design that is perfect for you and your family.

After the floor plan spaces have been arranged, exterior window and door placement, size, and location must be determined. Place these doors and windows on the floor plans and on the isometric plans. We will discuss generally accepted practices for window and door placement, but as in most design cases, there are no absolutes.

Bedrooms should have windows for light, ventilation, and fire access and egress. Check local codes for details on these requirements including opening styles and sizes. Bedroom windows should be arranged to allow for the necessary furniture and to allow for privacy. If only one window can physically be placed in a bedroom consider a skylight for cross ventilation.

Bathrooms should have a window placed in consideration of privacy and ventilation. Avoid placing a window over the bathroom sink where a mirror and/or medicine cabinet is usually more appropriate. If the bathroom has no exterior walls for window placement, use an exhaust fan.

It is typical in a kitchen to have a window centered over the sink. Additional windows if desired can be placed where they do not interfere with the necessary cabinet space.

Windows in the remaining areas of the house should be placed to best enhance natural lighting, ventilation, and to take best advantage of exterior views. Symmetry and centering should be considered. Interior wall space needs should be considered. Windows placed close to the floor, or in stairways, or near doors, should be made of tempered glass; check local codes.

Exterior door placement and size are also covered by most codes. A main entry door and a secondary door are usually required. Additional doors to exterior decks are often added.

Interior door placement must allow for traffic flow between all separate areas. Local codes and practices determine interior door size, with the required size of bedroom and hallway doors being larger than those of bathroom and kitchen doors.

More information about windows and doors is included in the next section. If you are planning to include an exterior deck, add it to your plans. Exterior decks have been placed in the component section for this purpose.

CHAPTER 9

Details, Details, Details

In the previous sections we have bee dealing basically with the “concepts” of building design.

It is important to integrate broad design concepts with minute building details to assure total design success. No detail is too small to encompass into the design process.

It is up to you to ask yourself all the right questions about your needs and desires in every aspect of your house design. There is not enough room in this guide to discuss all the possibilities available to you in all areas, for example: style of carpet, color of paint or stains, or type of bathroom fixtures. We will try, however, to provide enough information to enable you to ask yourself the right questions and answer them appropriately,

The basic areas of detail analysis and a brief discussion of the design requirements and some procedural tips for each are as follows: (you may wish to leave some of these areas in the hands of your draftsperson, engineer, or builder).

Excavation and Grading

Previously, you determined a location on your lot to place the house, driveway, and parking area. These areas must be cleared of tress, brush, and undergrowth. Before actual clearing, have these areas staked out and visit the site to determine if any final changes are necessary. It may be appropriate at this time to change the layout of the driveway or parking to save a tree or other physical attribute. It may be necessary to physically identify trees you wish removed and those you wish to keep.

When the hole for you foundation, crawl space, or footings has been dug, the grade elevations must be checked to insure that the house will be located above the final grade by that amount that was planned. This distance varies locally, but 12 to 18 inches above the final grade is usually enough to keep the wood framing dry and low enough to be aesthetically acceptable.

Septic/ Sewer

If you are installing a sub-surface disposal system it must be designed by a professional. You can, however, provide input as to the extent of the clearing necessary to install that system by adjusting the final location.

Foundation/ Crawl Space/ Slab

The choice of the above is a matter of local practice, local building codes, mortgage requirements, and personal preference. Check with local building officials for information about practices in your area.

If you are designing on a slab, make sure allowance is made for in slab system requirements. Be sure to allow space of a utility room.

If you are designing on a crawl space, be sure to allow an area in that space for support systems. Also provide for adequate ventilation.

If you are designing on a full basement, proper placement of support systems can save money and increase efficiency. Adequate basement windows should be provided for ventilation and light. Give some thought to the best location for an exterior access to the basement.

Framing

The details of the framing system are best left to a professional. All areas of the country have different requirements that deflect topographical and climatic differences.

The person you choose to draw the final plans of you house should be familiar with the local conditions. Through that familiarity a design to meet the framing system requirements of the local building codes is attainable.

General Exterior Finish

The exterior finish of you house is a matter of personal preference and local practice.

Drive around your area and look at different houses for examples of siding materials and roofing materials. Look at trim, shutter, and door colors.

Check the local building supply houses for ideas; go to building product trade shows to see all the latest products available. With careful though and planning it is possible to select a very satisfying exterior finish.

Consider the maintenance required for the different materials under consideration. Maintenance is both time consuming and expensive. Proper planning can deliver a comfortable and predictable maintenance program.

Windows

Among the many factors to consider when deciding on the type of windows to use in your house are size, method of opening, insulating values, options available, condensation performance, and shading capabilities. The cost of the windows is also very important. Be sure to take all the performance differences into account when judging the relative costs of windows.

Windows are an important part of the overall ventilation requirements of a house and also provide necessary fire access and emergency egress. In addition to your own

preferences, local and state regulations concerning window requirements should be checked.

Skylights (ventilation and lighting)

Skylights can be added to a roof system whenever there is a need to add natural light or to increase ventilation. Skylights are particularly valuable in wall height or in sloped ceiling areas where conventional windows cannot be installed.

Doors (access and egress)

Exterior doors are available in many styles, both solid and with glass. There are two common types of exterior doors: hinged and sliding. In most residential homes, exterior doors swing into the house. An advantage of sliding doors over swinging doors is less interior space is required for the door to open.

The exterior door on the front of a house is often used as a design statement to set the design tone for the entire house. Whether your design is colonial or contemporary your front door can lead the way.

Secondary doors (side or rear) often are not as much a dominant part of the entire design. This allows for more flexibility when they are chosen. Half-glass, full glass, sliding, patio, atrium, or multiples of the same, these doors can add natural light, provide ventilation, or provide dramatic views, and allow considerable design creativity and expression.

Insulation

Insulation is an important part of the house for both heating and cooling purposes. Because of its long term energy saving potential, there is a strong possibility of a high rate of return on any investment made on extra insulation.

The importance of year-round comfort should also be considered.

Find out the recommended minimum insulation requirements for ceiling, walls, and floors over unconditioned spaces in your area. Do not be afraid to increase the recommended levels, especially in ceiling areas.

It is important, however, not to over insulate any particular space or cavity. R-11 fiberglass insulation is the maximum thickness insulation designed for 2” x 4” framed wall cavities. If more insulation is desired, 2” x 6” framing can be used to accommodate R-19 insulation, or rigid insulation can be added to the interior or exterior of the 2” x 4” walls.

When specifying ceiling insulation it is important not to design a situation that will restrict air movement in the roof ventilating system. In cathedral ceiling areas or sloped chilling areas with no attic above, it is helpful to install Styrofoam baffles to allow for proper air movement.

Since the roof ventilating system has not been discussed before, we will discuss it now.

In order to minimize the temperature differential between the roof of the house and the first conditioned interior space, (in an effort to eliminate condensation and moisture build-up) outside air must pass freely between the roof and that first conditioned space. This can be done either with gable end louvers (in the case of an attic) or with a combination of sophit vents and ridge vents. A well designed cupola can also help in a situation where there is an attic. Make sure all roof framing bays are ventilated including bays below and above skylights.

Check on accepted materials and practices in your area.

Electrical System

The electric system in your house consists of two parts: the service brining electricity to the house and the plugs, switches, controls, and lights inside your home.

Conventional electrical service is either overhead or underground. Check with local requirements.

When determining the basic electric layout in your home, consider the following:

- Electrical outlet needs
- Traffic flow lighting
- General area lighting
- Specific area lighting
- Appliance requirements
- System requirements

Electric Outlet Needs

The qualified electrician hired by your or your builder will provide all the basic wiring required by local and state codes.

In addition to the code minimums, you should analyze your family's electrical needs as they relate to each room of the house. Do you need extra outlets for an entertainment center, for a computer or your specifically placed lamps? Do you have a need for specific outlets in your basement or garage? Outlets are much easier and much less expensive to add in the planning stage than after the house is built.

Traffic Flow Lighting

When designing a lighting layout for your house, consider the traffic flow patterns. Where should light be in order to illuminate areas that you approach and where should switches be to turn off the lights as you leave? As you enter a bedroom, hallway, or bathroom, or go in and out of the house, what lighting would make that movement comfortable?

As far as particular lighting fixtures are concerned, the sky is the limit in terms of variety and price.

General Area Lighting

What are your lighting needs in all the open areas of the house? Will you use lamps or would track lights or overhead light suit your fancy? Basement lights, garage lights, bathroom lights, bedroom lights, exterior deck lights, what are your needs?

Specific Area Lighting

Dining room table lights, bathroom vanity lights, under the cabinet lights, closet lights, a museum light to highlight the portrait of Uncle Ed, narrow beam, overhead bedroom reading lights (with conveniently placed dimmers on each side of the bed); there are examples of specific areas lighting. What are your requirements?

Appliance Requirements

In addition to the standard kitchen appliances, make sure provisions are made for all the "gadget" appliances that may be popular in your house.

System Requirements

What are the electrical requirements for your water system, heating system, air conditioning system, alarm system, or smoke detection system? The details of these requirements are best understood by your electrician, but a general reference to them in the specification document is helpful.

Plumbing System

The actual construction specifications of the plumbing system will be dictated by local codes. A qualified plumber should be capable of implementing the details of your design.

Is a simple, functional bathroom enough for you needs, or do your tastes run to the elaborate and expensive? There are no design and expense limits in bathroom planning. Know thyself and thy budgets.

Water System

If your water needs are being satisfied by a municipal system, the installers will be making all the final decisions. If you are installing a private well, it is necessary to check on local conditions to determine if a shallow or deep well system should be used. Will a 2", 4" or 6" well be necessary to satisfy your water volume requirements? Would you prefer a standard pump and pressure tank or would a submersible pump system be more appropriate? In either case, what horse power pump would be necessary to adequately deliver your families water needs? Check on local conditions and practices to make an informed decision.

Masonry Work

The principle masonry component of most new houses is the chimney. The chimney can provide gas and vapor removal from oil heat, gas heat, wood heat, etc. The chimney can be part of a fireplace or part of a wood stove area.

When designing a chimney and fireplace or wood stove area, design in extra flues, if possible, to accommodate the needs of your heating system.

Do you want a fireplace or wood stove? A fire place is attractive and can define a room, but a good wood stove is much more efficient. Is the purpose of your fireplace or stove aesthetic or practical?

Do you want an interior fireplace or stove, or should it be placed on an outside wall? Interior placement captures more heat, but and exterior chimney uses less square feet of valuable floor space.

If you are considering a wood stove area, check local codes.

It is necessary to observe minimum safe distances from combustible materials when installing a stove. The fire safety set backs are measured from the floor, walls, and ceiling. The area needed for a safe installation can be quite large.

If the codes in your area require a large heath area, consider designing a hearth flush with the floor level. This will lessen the traffic flow restriction.

Many materials are available for chimney and fireplace construction. Check on materials that are locally available. Allow the mason that you and your builder have chosen to help with the final details of your design.

If you are going to be adding a mantel or are trimming your masonry area with wood, be sure the mason and the builder understand each other's requirements. It is also important that the builder confirm framing openings with the mason. It is also important when designing the fireplace or wood stove area to make sure that the footings for the construction can be placed on solid, undisturbed ground. This means the chimney construction usually must start at the same level as the house footings. In the case of an

interior design, this means the masonry work will rise up through the middle of the basement. This will influence the uses and traffic flow in the basement.

Other masonry design considerations are stoops and steps, exterior veneered walls, and exterior patios.

Heating System

The two considerations when choosing a heating system are personal preference and local conditions.

Although any system can be put in any house, some systems are much more practical than others.

Consider the initial cost of the system. Consider the cost and availability of fuel. Consider maintenance of that system. Consider the practicality of the system. Consider the ability of the system to consistently deliver the comfort levels that your family requires.

Do you wish to incorporate central air conditioning into your heating system? A local heating contractor can supply you with information on systems that are practical in your area.

In addition to conventional systems, be sure to investigate the practicality of alternative heating systems.

Radiant floor heating lends itself to solar collector applications and solar enhanced heat and hot water are now economically feasible.

Standing Interior Finish

What types of interior wall and ceiling finish are you looking for? Sheetrock, plaster, paneling, or specialty woods are options. What color pain or stain would you like on these surfaces? What type of interior trim would you like around windows and doors? What kind of baseboard? What kind of interior doors? What type of finish do you want on these materials?

Your local building supply house can provide information and ideas in these areas.

Interior Floors

The variety of flooring materials and styles and colors is almost endless. What is practical for your family?

It often proves desirable to allow traffic flow patterns to influence flooring decisions. More durable products should be used in highly traveled areas.

Consider the daily maintenance requirements of your flooring choices. Consider the daily use of the different floor areas in your house. Every family will have a different impact on flooring areas. Are baseball spikes or ballerina slippers likely to be running through your kitchen? Young children will be more likely to test the water containment ability of your bathroom flooring products than mature adults.

Your local building supply house can supply information on all your flooring needs.

Kitchen and Bath

When designing a kitchen or bath, the primary concern should be practicality. Will the design successfully accommodate your family's needs now and in the future? Styles, colors, and surface types are varied. Appliances and fixtures also vary greatly.

Check local supply houses for information. It is particularly important to make correct decisions in the kitchen and bath design and detail choices because of the expense of making changes later. It is easy to change the color of a wall or the change wallpaper, but it is difficult and expensive to change cabinets, vanity design, or countertop surface.

Closet Finish

Think about entry closets: bedroom, closets, linen closets, utility closets, and pantry closets. What are your shelving arrangement requirements? Where do you require closet poles?

Are wood shelves or particle board shelves acceptable, or do you require wire-frame shelving?

In which closets would you like lighting? Have you allowed sufficient storage space for brooms, mops, and vacuum cleaners? One of the most common complaints about he design of particular house is the lack of closet and storage space. For total design satisfaction, be sure to analyze your storage needs carefully.

Stairs

When deciding stair finish, consider aesthetics, safety, wear factors, and noise. Are your stairs a focal point of your design, or are they more practical in nature? Finished hardwood stairs can be slippery and noisy. That could be a problem if they are used by the elderly or the very young. In that case, carpet may be the appropriate choice.

Carpet, oak, pine, locally available hardwoods, or tile, can all be used as a finished surface for your stairs.

What style stair system are you using, closed walls, half walls, railing and balusters, or a combination? Check your local building supply house for ideas.

All stairs should have handrails. Check local codes for specific requirements.

Decks and Stoops

Exterior decks add greatly to the enjoyment of a home. In the design process consider size, placement in relation to shade and trees, property lines, access and egress, traffic flow patterns, and what your particular uses will be.

An integrated deck system can tie together a secondary entrance with a sliding glass door and an enclosed shower system. This integration keeps traffic patters on the decks and off the natural grade and helps keeps the house cleaner.

When designing your deck, allow room for deck furniture, barbecue equipment, or even a whirlpool. Also, allow enough area to use all deck stairs and building entrances without obstruction.

Decks should be built of materials that will withstand outdoor exposure. Pressure treated materials can be used to increase deck life. Other materials can be used if they are properly treated. Railing systems should be used on decks and stairs in most situations. Check your local requirements.

Footings for deck support posts and stairs must also meet local requirements.

Landscaping

Landscaping puts the final touches on the entire exterior project. It can be as simple as recovering all areas disturbed in the construction process, or it can be an elaborate system of walkways, driveways, flowers, shrubs, trees, or other plantings. Time and cost usually determine if the landscaping is handled by professional landscapers or by the homeowner.

Although all these details can be found on some sets of plans, it is helpful to organize theses details into a document that we shall call “General Construction Specifications.”

A sample GCS document is included in a later section.

Chapter 12 (deleted)

CHAPTER 13

GENERAL SPECIFICATION DOCUMENT

This particular specification document is not designed to be used by you in its present form. It is intended to be a guide to help you draft your own document. It is important that each specific item be changed if necessary to reflect the particular details of your house and building situation.

All of the specific information required by the builders or building officials in your area may not be included in this sample document.

Any necessary information that is missing in this sample specifications document should be discovered by your potential builders during the bidding process. The document can then be further modified before a contract is executed.

In addition to detailing the specifics of your house the specification document also discusses responsibility for unforeseen expenses and cost overruns.

Allowances are used where particular products are not specified. The allowances provide an even bidding field for the potential bidders, and give you flexibility in your decision making process. Whenever possible, allowances should be replaced by specifications.

This particular specification sheet is for building a four-bedroom cape on a heavily wooded lot with no municipal facilities.

As you will see, the owner has not made all the final decisions at the time this document was prepared. Because of this, some flexibility was built into the document.

This particular owner would like to make some of the final design decisions during “walk throughs” of the house during the construction process. When the final decisions concerning details left undecided in the specification sheet are made, the builder should be informed in writing.

General Specification Document

Permits

A well permit or municipal access permit will be provided by the builder.

A permit for a subsurface disposal system rated for a four bedroom, house will be provided by the builder.

A building permit will be provided by the builder.

The builder will provide an occupancy permit upon completion of the contract.

Conservation commission permit, appeals board permit, zoning board permit or association permit are not needed.

Excavation and Grading

The lot will be cleared and brush and tress will be removed, only as necessary to build the house, install the septic system and cut in a 50' driveway. Excavation and tree and brush removal costs associated with cutting in a driveway over 50' in length will be charged to the owner.

Finish grading with available soil only will be included. The extra cost of bringing in additional fill or removing excess fill will be charged to the owner.

A minimum landscaping package is included in the price. The driveway will be cut in and finished with 3/8" washed stone or equivalent. The extra cost of finishing a driveway over 50' long will be charged to the owner. All disturbed areas will be revegitated with a combination of seeded areas and areas of wood chips.

The purpose of the landscaping package that is included in the price is to recover disturbed areas.

The cost of any abnormal excavating occurrence necessary for construction or habitation will be charged to the owner (i.e. blasting, water problems, or access ramps).

Septic System

An allowance of $( ) will be included to construct a subsurface disposal system according to an engineered plan.

Foundation

16" x 8" footing will be provided under all subsurface basement walls. Poured concrete basement walls will be 8" x 7'6".

Tilt out basement venting windows will be provided.

Sub grade foundation walls will be tarred for waterproofing.

Basement floor will be 3 ½" poured concrete with steel trowel finish.

An exterior bulkhead door will be provided as per plans. The exterior bulkhead door will be painted by the builder. An exterior steel energy door will be installed between the bottom of the bulkhead stairs and the basement.

The costs associated with a walk out basement, wood framed basement walls, partial basement wood framed walls, and retaining walls (if any of these changes are desired) will be charged to the owner.

Framing

All framing will be as per plans.

2” x 6” exterior framing.

6” x 10” girder.

2” x 6” pressure treated sill,

2” x 10” floor joists first and second floor 16” o.c.

5/8” cdx plywood subflooring.

2” x 8” collar ties 24” o.c.

2” x 10” rafters 24” o.c.

2” x 12” ridge.

½” cdx plywood exterior sheathing (sidewall and roof).

Roof and attic will be ventilated by continuous ridge vent and continuous sophit vents.

Typar or Tyvek house wrap is included.

Exterior Finish

Exterior sidewall will be finished in white cedar “clear” shingles. Except red cedar clapboards will be fastened with stainless steel nails.

Exterior trim will be either painted common pine or common red cedar left natural. Plastic exterior trim is also available. Plastic trim can be left white or can be painted

Dimensional “architect” style asphalt roof shingles will be used.

Gutters or downspouts will be included.

Exterior doors and windows (Andersen windows, skylights and slider, Stanely steel exterior doors) will be installed as per plan. The Andersen windows will be terrytone if red cedar trim is used and the windows will be white if painted pine or plastic trim is used.

Screens will be included for all windows, skylights, and sliders.

The builder will paint the exterior doors in the owner’s choice of colors.

Grills will be provided for window and door glass.

Insulation

Basement ceiling R-19.

Exterior walls R-19.

The house ceiling will be insulated with R-30.

All insulated sloped ceilings will be provided with Styrofoam ventilating baffles.

An energy door will be installed at the top of the basement stairs and between the bottom of the bulkhead stairs and basement.

All exposed hot water pipes in the basement will be insulated.

Electrical System

A temporary service will be provided.

150 amp permanent service will be provided.

There is a $( ) allowance for underground electric service. This allowance is for trenching, electrical cables and conduit, meter pedestal, and labor. All costs associated with providing electrical service if electrical service is not readily available will be charged to the owner.

Switches, plugs, and fixture outlets will be provided according to building codes and owner's specifications within the standards of the codes. All costs associated with plug, switch, and fixture installation beyond code requirements will be charged to the owner.

There will be an allowance of $( ) for lighting fixtures.

Smoke detectors will be provided according to building code.

Telephones will be prewired at owner's expense
Cable TV will be prewired at owner's expense

Plumbing System

The plumbing system will be installed to meet all state and local codes.

Standard fixtures are included.

All costs associated with the installation of nonstandard plumbing fixtures will be charged to the owner.

Hot water will be oil fired.

Outside sillcocks per code are included.

Exposed hot water pipes in the basement will be insulated.

Washer and dryer hook-up will be provided in basement.

Water System

The base price of this house includes a $( ) allowance for a 4” well, a pressure tank, and a ½ h.p. pump.

Masonry Work

A two-flue chimney with fireplace is included.

A brick front stoop is included.

There is an allowance of $( ) for all masonry work.

Heating and Air Conditioning System

There are many options to consider in this category. We will be happy to work with you to design a system that incorporates you needs.

Interior Finish

All interior partitions will be 7'4” 2” x 4” studs 16” o.c. (except necessary 2” x 6” plumbing partition walls).

All interior walls and ceilings will be sheetrock. Walls will be primed two coats and ceilings will be textured.

Interior doors will be 6-panel pine and closet doors will be louvered.

Interior trim will be 2 ½” colonial casing.

Baseboard will be 3 ½” o.g.

Doors and interior trim will be either stained one coat with nails set and holes plugged and two coats of polyurethane sealer applied, or primed with nails set and holes plugged and painted one coat with interior semi-gloss latex.

Interior Floors

An installed allowance of $( ) per sq. yd. is included for all interior floors.

Kitchen and Bath

The allowance for the kitchen cabinets, countertop, and backsplash is $( ).

There is an allowance of $( ) included for kitchen and laundry appliances.

The bathroom allowance included in the price includes a 30” standard oak or Formica vanity with laminate countertop and backsplash, and a wall mounted mirror.

All costs associated with further customizing the bathrooms will be charged to the owner.

Towel racks and toilet paper holder supplied by the owner will be installed by the builder in the owner’s choice of location.

Closet Finish

Bedroom closets will have one shelf and pole on available walls. Linen closets will have multiple shelves.

Stairs

Basement to first floor 2” x 12” stringers, 2” x 10” treads, 2” x 4” handrail. First floor stairs will be carpeted as per above allowance.

Decks and Stoops

A brick front stoop will be included.

A 10' x 12' pressure treated rear deck is included.

Misc.

Any actual costs below the allowances will be deducted from the final contract price. Any costs above the contract allowances will be charged to the owner as they occur. The builder will carry liability insurance. All workers on the job site will be covered by workman’s compensation insurance or equivalent coverage. A specific builder’s risk policy will be carried by the owner of the new construction.

Chapter 14

Construction Contract

Once you have decided on plans and specifications, a contract should be signed to make everything legal. We have included a simple contract here for your examination. If you would like additional protection, have a lawyer draw up your contract, or have a lawyer review the contract provided.

Construction Contract

This agreement made and concluded this ( )th day of ( ) by and between "Owner" of the town of "Anytown" (hereinafter referred to as "client") and "Builder" (hereinafter referred to as "Contractor"):

Witnesseth, that contractor in consideration of $(enter price) agrees to provide labor and materials to build a (enter style of house) on (enter address), according to attached plans titled (enter name) and dated ( ) and according to the general specifications dated ( ).

Client agrees to make payments to contractor I accordance to the following schedule:

5% upon signing contract
10% upon installation of foundation
20% when plywood tight
20% when weather tight
10% when ready for sheetrock
10% when sheetrocked and primed
15% when kitchen and floors installed
10% upon completion

Contractor agrees to provide all work and materials of good quality and to perform all work in a timely and workmanlike manner.

Contractor further agrees that a one year contractors warranty of materials and workmanship shall run in favor of client.

In testimony whereof, we have hereunto set our hands and to duplicate instruments of the same tenor and date on the day and year first above mentioned.

_____

_____

Clients

_____

Contractor