



Architectural Alliance, Inc. is a customer oriented and service minded architectural design, construction administration and owner representation firm opened in 1993. The director of Architectural Alliance Inc., Eric P. Enfield, AIA, President, is a long-time Santa Fe resident who specializes in Northern New Mexico and Santa Fe style architecture. See our website at www.archallinc.com.

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This handbook was created by Eric P. Enfield to assist you with your home buying process. It is written in common, everyday language so you don't have to be an Architect to understand. We hope that you enjoy this publication.

EVERYTHING YOU NEED TO KNOW ABOUT BUILDING A HOME FROM AN ARCHITECT'S EYE

*The following handbook is based on articles that appeared in the
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1. A BRIEF HISTORY OF SANTA FE STYLE

The year was 1250 A.D. the pueblos of the Galisteo Basin were thriving. Adobe and timber structures of multiple stories and in some cases thousands of rooms dotted the horizon. Little did these Native Americans know their building style would be thriving in the 1990's in the same areas. The "Santa Fe Style" which draws visitors from around the world and entices thousands of new residents a year is the result of not just its Native American roots, but also Mexican, Spanish and Anglo influences.

The Native American and Native Mexican populations choose adobe as their preferred material for many reasons, the primary reason being the abundance of its basic ingredient, soil. It could be poured, molded, formed and dried into vertical walls that had the highly desirable insulative qualities of being cool in the summers and warm in the winters, to this day we are not able to apply our modern formulas of determining the "R" value of a wall to adobe. It has unusual qualities which when combined with a soil roof created a totally natural yet man made environment on the interior.

Vigas (beams) and latillas (decking) were used to support the soil roofs and even bark was incorporated to fill the gaps between the latillas to keep soil from falling between the decking onto the inhabitants below. The vigas with one big end and one little end provided the natural slope to create a sloped roof, this was and is important to drain standing water. Vigas were hard to come by in these times and the native populations maximized their use by spacing them far apart and spanning the gaps with smaller branches (latillas). These materials were those that were available from the land in this semi-arid environment and for many centuries these were the only materials available (of course stone was used in many old structures also).

The availability of new materials coincided with the coming of the Europeans, first the Spanish from Mexico and then the Anglos from the new United States.

The Spanish who came to New Mexico in the late 1600's brought with them new skills that could be applied to existing materials in this area. Wood could be carved, metal could be created with the combination of certain natural elements, stone could be cut, glass could be made and wheels could be shaped. All these skills led to a metamorphosis of the native style to a conglomerate of native and Spanish styles.

The Anglos who arrived in the mid 1800's brought with them new skills as well. Brick making, wood milling, metal machining were some of the more important skills. These techniques were a result of the industrial revolution which made it easier to make units out of buildings. Now buildings could be measured, scaled, drawn and built. When the railroad came in the 1880's everything changed. Non-native materials became readily available. Exotic woods, plasters, paints and cement were all now within reach. New styles were introduced to this area. Victorian, Georgian, Territorial and Greco-Roman were now all possible and as more and more settlers arrived more and more dreams were realized by the newcomers resulting in a conglomerate of even more building styles. Metal roofs began appearing, grandiose details in wood and plaster were used and choices in building materials were available from wood to wrought-iron.

In the 1940's many Santa Feans and area residents recognized the importance of their past and began a drive to regulate design in the core of Santa Fe. This resulted in the creation of a regulatory body intended mainly to preserve old buildings from alteration or worse yet demolition. There have been many buildings that have been saved from inappropriate renovation or demolition by the Historic Design Review Board.

The Historic Design Review Board has carried its charter even further by also regulating new buildings and any renovations of any existing buildings. Its boundaries have expanded also to include some old residential areas and many areas of the "Eastside". Their regulation has been controversial in many ways and has led to the loss of many old buildings that were not in the "Santa Fe Style" particularly on the Plaza where only the Catron Building and the Palace of the Governor's carry any resemblance to their historic past look. This regulation has led to a continuity of looks throughout the downtown area which many people see as maintaining Santa Fe as a tourist Mecca. It appears this regulation will only continue to increase over the years, but Santa Fe Style must be looked at for what it is, a conglomerate of styles that has developed over centuries.

2. SANTA FE HISTORIC DISTRICT ORDINANCE

In the last chapter we discussed where “Santa Fe Style” came from and touched on the governing body that regulates design in the Historic District, the Historic Design Review Board. I’d like to discuss further that Ordinance No 1957-18 that changed the way Santa Fe would present itself to the world forever.

The purpose of the creation of this ordinance in it’s own words was; “In order to promote the economic, cultural and general welfare of the people of the city and to insure the harmonious, orderly and efficient growth and development of the municipality, it is deemed essential by the City Council that the qualities relating to the history of Santa Fe, and a harmonious outward appearance which preserves property values and attracts tourists and residents alike, be preserved; some of these qualities being: The continued existence and preservation of historical areas and buildings; continued construction of buildings in the historic styles, and a general harmony as to style, form, color, proportion, texture and material between buildings of historic design and those of more modern design.” This original purpose statement is intact almost verbatim in our existing 1995 Santa Fe City Code. Looking at this purpose statement shows: 1) The importance of tourism and residents alike. 2) The importance of preserving existing historical buildings. 3) The importance of maintaining and creating a harmonious look to Santa Fe.

It appears that all three of these items have been carried out successfully. As of item #1 has been under constant question; Do we want more tourists or residents? I’m not sure anyone can control this seeing as all individuals in our country are guaranteed the right to move about freely and live where they wish. Certainly by carrying out #2 and #3 we are making the city more attractive and thus physically attracting new tourists and residents by our own city ordinance. A bumper sticker I’ve seen around town can’t help but shed some light on Santa Fe’s continuing history; “Santa Fe - 300 Years of Tourism”. I think this really could be changed to 600 years or more considering the fact that Native Americans migrated and traveled through this same area for trade, hunting and relocation purposes.

The specific rules of the ordinance have been evolving over the years with the influx of new larger scale developments. The ordinance specifies an “Old Santa Fe Style” character-

ized by adobe bricks and include “Pueblo, Pueblo-Spanish, Spanish-Indian or Territorial, and Recent Santa Fe Style” which is defined as a “development from, and an elaboration of the old Santa Fe style with different materials and frequently added decorations”. From their definitions we can see that our forefathers saw that existing old structures carried with them an older style while new buildings had a more modern style. This definition of two different yet harmonious styles allows for some variation in new construction vs. renovation of old existing structures. This ordinance thus was not written so every building looks the same but that a healthy variation can and may occur within the structure of this ordinance.

This control has further been defined by classifying existing buildings as either significant, contributing or non-contributing. This is achieved first by age, the building must be 50 years or older to be considered any of the above classification and secondly by it’s condition related to how much it has been altered. If a building is over 50 years old, has documented historical past and is largely unaltered on the exterior it may be classified as significant, if a building has a documented historical past but has been altered yet some important details exist it may be classified as contributing, a building with no historical significance and that has been altered significantly will probably be classified as Non-Contributing. These classifications become very important when proceeding with a renovation. If a building is considered significant it will probably be not allowed to change the exterior in anyway and any additions will not be permitted on a primary facade. Any additions square footage shall also not exceed 50% of the square footage of the existing footprint. The above applies to both Significant and Contributing structures, but typically if a structure is Non-Contributing you will be allowed much leeway in the alteration or addition to the structure.

There are many other rules and regulations that pertain to glazed area allowed, colors allowed, heights allowed and if you talk to anyone that has gone through the process it is recommended that first city staff be contacted to review any proposed changes or additions by your designer or architect, and secondly you are clear in your presentation to the Historic Review Board and thirdly and most importantly exhibit patience, the process could involve from one to four months.

3. HIRING AN ARCHITECT

The three red tags on the front door of the residence boldly stated "City of Santa Fe Notice to Stop Work". I immediately began to wonder why the owner had decided not to obtain a permit for the construction. It appeared that the only work being done was replacing windows and patching stucco but is the owner aware of egress requirements out of bedrooms, proper venting of heaters and the numerous other code upgrades that may be required by the City Officials when undertaking a renovation. This individual could have saved both time and money had he only consulted with a qualified licensed Architect.

An Architects mission is simple; provide a safe, clean environment for people to live and work in. This is achieved by the Architect interpreting both his clients needs and the strict city/county code guidelines to develop working drawings that conform to the particular guidelines set out by both the parties mentioned. The drawings are used to obtain a permit and used by the contractor for the actual construction. These drawings also serve many other purposes, probably the most important in a renovation are 1) documenting existing conditions 2) addressing code issues 3) determining budgets by utilizing the drawings to obtain pricing from general contractors, subcontractors and suppliers. The three items listed above hold importance whether a job is small or large. Of course, the larger the job the more requirements and needs that must be met and addressed by an Architect. Sometimes these larger jobs require the Architect to assemble a team of design professionals including, but not limited to, structural, electrical, mechanical and civil engineers, and sometimes interior designers.

Along with translating the clients needs and ensuring code requirements are met, the architect also can help in the bidding/negotiation process with the contractor. Additionally, the architect can observe the physical construction, acting as the client's representative to ensure adherence to the drawings. Every job is unique though and some jobs do not require full architectural services as described above.

Most architects will structure their fees based on what level of services an individual job may require. This makes fees dependent on the particular job and for that reason, fees can vary quite a bit. Don't let architect's fees scare you! Over the

forty to sixty year life cycle of a building, design fees are a small fraction of the overall cost. An architect's expertise can save the owner a substantial amount of maintenance and money over the years.

The final point I'll make about hiring an architect is that with present city/county codes and specific design restrictions, the client typically requires an architect simply to interpret these complex and changing code requirements. Certainly a building or residence owner can not be expected to keep up with landscaping or paving requirements for something as simple as a parking lot, but your architect should be familiar with these.

Now that you've decided to hire an architect be careful in your selection of the firm you choose to work with on your project. You will be working on a personal level with this firm on a small job for possibly a couple months, but on a larger job you could be working together for a few years. So, choose the firm that seems both compatible with your specific needs and one that you are also personally comfortable with. If you are interviewing a larger firm make sure you meet the architect/designer that will be assigned specifically to your job. Always remember the architect is not just concerned about the quality of their design, but also the potential cost-saving and quality of the building you end up with as the client.

4. UNDERSTANDING THE ROLES OF YOUR ARCHITECT & BUILDER

It's been one year since you started the process of building a home. You worked 4 months with your Architect and 8 months with your Contractor, how does it feel? Both the Architect and Contractor hope it was a great experience, but there are many issues and emotions that have been dealt with over the last year, three entities had just signed contracts a year before binding them contractually. The Owner, Architect, Contractor relationship is complex but completely explainable.

The Owner desires something, the Architect designs something and the Builder builds something. As simple as that may sound that is the way all legal contracts define the responsibility of the three above parties.

The Owner hires an Architect, the Architect draws plans and the owner hires the Contractor. The Architect is not involved in the Owner/Contractor agreement except as the owner's agent when requested or required. The Contractor's obligation to the owner is to interpret the plans or contract documents and build it to meet all applicable codes. The Architect's obligation is to insure the contract documents and the design intent is what is built.

If the owner desires a change during construction they should consult with their Architect and determine the most economical and reasonable approach to the change and then the Architect present it to the Contractor for their input. A cost or a credit should be presented to the owner for their approval prior to the change being made physically. Wise decisions can be made while building if all three parties work together.

The responsibility for the quality of the construction lies strictly with the Contractor. The Architect is responsible for clarifying the plans when a question is raised and observing the work to insure its acceptability and insuring the Contractor lives out his contractual responsibilities by reviewing monthly pay applications and schedules and reporting his or thoughts back to the owner. This service provided to the owner is meant to serve more as a check on the contractor than as a watchdog to tell the Contractor how to build, he or she should already know how to build.

As the job nears completion, the Architect is responsible for determining what is left using a punch list at about 90%. He will determine the date that will bring the job to full completion. This date will insure the Architects fulfill their contractual

agreement. Likewise, the Contractor's responsibility is to complete the project in a timely and professional manner and organize his subcontractor's to complete punch list items with as little interference with the Owner's life as possible. Those issues that are still outstanding should be listed by the Architect and Contractor and presented to the Owner for resolution. Care must be taken by the owner that these steps aren't omitted or not done. A punch list is extremely important as is the other documentation required to close out a job including lien releases and transferring insurance from Contractor to Owner.

The contractual responsibility doesn't end with the completion of the project but actually extends for the one year warranty period when the Architect does an inspection one year after the Date of Substantial Completion and the contractor must correct any items.

The one year cycle is important because typically a house or project seasons through the different weather conditions and one year allows the house to complete the full weather cycle. This is typically when cracking and/or settlement may occur.

The responsibilities of the three parties are laid out in AIA (American Institute of Architects) documents. I highly recommend using these when entering into a contractual relationship with either an Architect or Contractor. These documents are available from the Albuquerque AIA office at (505) 244-3737 or give me a call at 988-5269 and we can help you obtain them.

5. PURCHASING A FIXER-UPPER

You were reviewing Sunday's real estate ads and you see a classified that states; Home for sale by owner, great location, needs some work. You call the owner and find out it is in the neighborhood you want to live in and the price is extremely reasonable. You arrange with the owner to meet at the house the next day with your real estate agent.

What should your next step be? Having personally bought and sold residential real estate I'd recommend looking at confirming three things prior to putting in an offer:

- 1) What is the properties true value?
- 2) What is the existing condition of the property?
- 3) What work is required to make the house livable?

Once you have answered these three questions you are ready to make an intelligent decision on what to offer and what money you can anticipate spending to make it the place what you want it to be.

To determine the properties true value you will need to do two things. The first is to have your real estate agent pull up from the Multiple Listing Service comparable properties in the neighborhood and see what they are selling for. This will give you a good idea what the market value is. Your real estate agent should also be able to pull up previous sales in the area which would show what the asking price was and what it actually sold for. This can be very useful in adjusting the asking price to determine a fair purchase price. You also can actually get the previous sales price, in some cases, by digging through old county files at the County Courthouse. Though this information is not always available it can be extremely helpful to know what the property sold for and when it sold last. This information can be used in the same way as the comps or recent sales in the area.

With this information in hand your are still not ready to determine what price your going to offer until you look at the house. The inspection process begins before you even arrive at the property. Look around as you drive through the neighborhood. Is there pride of ownership? Is it a rental or mostly family occupied neighborhood? Is there graffiti or trash all over? Keep the answers to these questions in your mind and as you drive up to the property how does the approach feel? Is there enough off-street parking? Is there room for expansion of the existing residence? Has the yard been kept up?

Is there junk or trash on the site? These factors will determine the neighborhood and street appeal of the property which is important for value and resale purposes.

As you walk around the residence look for large cracks in the stucco, windows that are out of square, concrete slabs that have cracked. These could be signs of inadequate structure or major building settlement. If these are present I would recommend calling a Structural Engineer for him to review it and make any recommendations. The other main concern on the exterior is the condition of the roof. I always go onto the roof and look for some specific items. Are there cracks or bubbles in the roofing material. At the connection between the roof and the parapet has the roofing cracked or pulled away from the wall? Are roof penetrations properly sealed? These questions will lead you to a quick determination on whether you will need to replace the roof and always keep in mind in old houses you may have no insulation in the roof and there may be three, four or even five roofs on the building and by code if there are two or more roofs already in place these must be stripped off before a new roof is installed. Also look at how the water drains. Is there adequate slope? Does pounding occur on the roof?

It is now time to look at the interior of the house. I typically start by looking at the big ticket items like electrical, plumbing, mechanical and structural. On electrical look at whether all switches and lights work, how old the existing electrical wire looks and if the electrical panel appears legal and if it has the required disconnects and circuit breakers. Sometimes by turning all the lights and appliances on all at once to see if the panel can handle the demand. If anything does not feel right and you see signs like exposed wire I would call an electrician in to walk-thru the residence.

To check plumbing first look and see if the pipes coming off the water heater are copper, if they aren't then service is probably old. I also check the water pressure, the length of time the hot water takes to get to the faucet, if toilets flush properly, how quick a tub or shower drains and check the make and model # of the water heater to see if it's age will probably mean it will need to be replaced anytime soon. Other issues if you're dealing with a property fed by a well are quality of water (a water test starts at about \$100), have a professional

check all pumps and do a flow test on the well. You can even get well reports from the State Engineers office.

Depending on what kind of heating/cooling system is in the house, here are some quick and easy things to check. Turn up the thermostat(s), does the boiler or furnace kick on promptly? Is there a vent to the outside and is there a grill into the room or closet introducing fresh air? Do the filters look clean? As with the water heater also take down a manufacturers name and model number to determine if the unit is to small for the size of the house and how old it is.

Checking structure is also important. Are any ceilings sagging? Have any of the floors become soft and spongy (could be wood rot underneath)? Do any of the walls or ceilings have paint peeling off or plaster falling off the walls? This could mean water has been leaking into the building. These last four items can cost \$1000's to correct and I look at these items first, on the interior. Then it is time to look at the fun stuff. Start by thinking what you would ideally like this house to be like. First of all could it ever be what you wanted it to be? Obviously if the answer is immediately no as you drive up to the house do not waste your own and your agents time, do a quick walk-thru and leave. If you think it might fill the bill then start looking at the quick and easy things you could do to fix it up. Sometimes removing everything added by the different owners over the years will really clean up the space and bring the building back to it's more original condition. Always remember that if you are looking at purchasing a property in the Historic District you may be limited to what you can do but the Historic Style staff at the city of Santa Fe will be happy to talk to you.

Other things to look for are concealed beams or vigas above dropped ceilings or plaster ceilings. Wood floors under existing carpeted areas and if your really lucky discovering a below grade root cellar lined in stone (which actually happened to me). Buying can be tough, but when you find a great place, weigh all the above factors and come up with an offer, make the offer, buy the house and you will start a project with probably no end.

6. REMODELING YOUR NEW RESIDENCE

When purchasing a home in Santa Fe, some alterations are almost always in order. Remodeling is typically the bread and butter of our firm. In fact, renovation is more prevalent than new construction, due to Santa Fe's limited land base (we're backed up against the southern Rockies on our east side).

With a remodel, many known and unknowns must be dealt with. The top priority is obtaining as-builts. As-builts are drawings that show existing conditions, mainly room layouts and sizes. If any exterior work is to be done, exterior elevations will also be important.

Once these drawings have been done—or better yet, original plans obtained you are ready to sit down and begin the process of altering your plan to meet your needs. I always start by asking clients what they need, prioritizing this list of needs, and then establishing a budget. Typically the needs exceed the budget, so the list of priorities becomes extremely important in bringing a remodel within budget.

Once needs have been identified, we can determine if the existing house and its layout can meet these needs or if additional square footage is required. Often by looking at an existing space closely, we find that adding square footage may not be necessary.

The biggest and most common mistake made is trying to make a house something it was never designed to be. For instance, I've seen many people say they want the kitchen where the bedroom was, the living room where the kitchen was, the dining room where the bedroom was, and so on. This approach attempts to make the house and its layout something it probably shouldn't and can't be, and it will cost the owner many thousand of dollars.

Working within the existing house's parameters will save the new owner thousands of dollars and probably relieve the potential for unforeseen problems that could cost even more money. If additional square footage is required, look closely at how the new addition will fit into the fabric of the existing house and its layout.

A recent remodel my company was involved in solved the problem of a client with five children and only a three-bedroom house. We converted the oversized garage (which was insulated and finished) into four new bedrooms and a play area. The existing garage slab was luckily already recessed, so all we had to do to heat the space was put in new radiant heat and pour a four-inch concrete topping on them. This was a lot cheaper per square foot than a new five-room addition would have been.

The key to a successful remodel is doing your homework with your architect, understanding your needs and working within the framework of the existing house. By doing these three things you've gone a long way to ensuring a successful remodeling project that remains within budget.

7. SITING YOUR NEW RESIDENCE

As we drove up to my clients new 12.5 acre lot in the Tesuque area, three words came to mind - access, location and orientation. We had obtained some important information pertaining to zoning, building setbacks, and access to public utilities. I had asked the owner to bring the legal plat and any accompanying restrictive covenants, both of these were in his closing package which he had received from the Title Company. We had already stopped at Bascamp and purchased a USGS map which would give us an idea of existing topography. The property corners had been staked from the recent survey and we were ready to walk the site to locate potential house and driveway sites. We had begun the process of selecting a site for his new residence.

I began the site search by looking for a natural point to enter the lot. This can be the first dollar saving decision. You don't want to enter against the grade you want your driveway to look like it was meant to be located right there. Instead of looking at the driveway going straight to the site, let the driveway meander up to the site and avoid cutting down trees wherever possible. Also look at avoiding arroyos and not effecting existing drainage patterns. One of the most important considerations in the winter months is orientation. Your driveway should have southern and western orientation so in the winter months you don't have to constantly worry about snow and ice buildup. The final point I'll make about driveways is by all means look at sharing a driveway with a neighbor, this can cut the disturbed area on both lots in half and increase the aesthetics on your lot and your neighbors.

Now that the parameters for driveway location are understood let us start looking for house locations. Starting this process can be done back at the office by looking on the preliminary topography and identifying buildable areas. Stay away from areas that have excessive slopes (over 30%) and ridgetop areas which are usually exposed to elements such as wind. Instead look for areas with good orientation (solar) and that are naturally protected, like bowls or shelves. Knowing what we are looking for, we can now walk the lot and look for potential sites. The most important thing is to walk the whole site, there maybe a beautiful area that could be overlooked because it is not easily seen. Another aspect to be aware of is whether the client will also want a future guest house, stables or some other accessory structures. This should also be discussed during this initial site visit.

Once all the sites have been identified, start weighing them against each other with these three basic criteria in mind: 1) access, 2) location and 3) orientation. A big part of this process should also be looking at existing houses or potential future buildings on adjacent lots to make sure a site with maximum potential for privacy is chosen. Avoid sites that are exposed to the prevailing winds or have excessive northern exposure. Keep in mind your site must be workable through all four seasons that we enjoy in Santa Fe and its surroundings.

There is no better feeling than finding that perfect site with the client and beginning the design process. I'd also like to point out that this process should be used whether your lot is 2,000 square feet or 2,000 acres. Don't get caught in the trap of hastily picking a site that may not be the perfect one.

8. SITING YOUR NEW RESIDENCE II

In the previous chapter we discussed how to pick out the proper house site and road location for your new lot. In this article I'd like to discuss the actual siting of your new house.

The first step is having a clear idea of what spaces need to be incorporated into your new house. Make a list of the rooms required and their approximate sizes, take this to the site, you can then begin to put together the layout of your house. Place the more public spaces like the dining room, living room and kitchen on the southern and western side of the site. The lived in spaces will be much more comfortable with good natural light and heat gain during the cold winter months. Place the more private spaces like bedrooms and bathrooms on the quiet side (away from roads and driveway) of the site and preferably with eastern orientation so you wake up to the sun. Garages should be on the least attractive part of the site and if possible bermed in on the Northside. Closets, utility rooms and other accessory spaces should never be located on exterior walls, they should be ingeniously incorporated internally.

Now that we've determined the rooms needed their sizes and their approximate locations let's look at other site issues. One of the most important issues is balancing cut and fill in the excavation work for your new house. This is achieved by a very basic principal, set a height for your finish floor that matches a contour (a certain ground elevation) that runs approximately through the middle of the house. This means that where the finish floor is below the line of natural grade, the soil will be removed and placed in the areas where the finish floor is above the natural grade. This will save you money by eliminating the need to either import or export soil to the site during construction.

With a finish floor level set you can now look at how the rooms will work together on the site. Maybe stepping down into the Living Room will add a gracious feel to the room if you do this make sure the Living Room is located on the site such that two or three (never more) steps are needed. Never add steps just to have steps in a house unless there are needed for existing grades. Another pet peeve of mine is garage location. Do not make the garage the first thing you see when you drive up to your house. Tuck it back in the corner of the house, let the living spaces of the house be the first visible elements you see as you drive up to the house. This is much more attractive than an 18' garage door.

Another important element is outdoor spaces. When doing your house siting keep in mind that 6-8 months out of the year we have wonderful weather. Make sure you provide areas for developing outdoor spaces either now or later. If your doing yard walls follow existing contours and let the wall match the form of the terrain, if they don't they will look out of place. Think about other things also like where a vegetable garden might go, where the dog run may be, where you will park your boat or RV, where you will stack your firewood. Though these things seem trivial or small the time to look at these things is now.

9. OUTDOOR SPACE DESIGN, INTEGRATING INDOOR/OUTDOOR

The rains have finally come and your garden has rebounded from the lack of rain. Some plants did not make it, but your basic landscaping has survived. It is time to take a look at your outdoor spaces including the built environment and make sure you have what you want.

If your building from the ground up or for that matter remodeling there are a few basic things I look for:

- A) What is the quiet or private side of your site?
- B) Where do you get good solar orientation?
- C) How do you live? Do you spend a lot of time outside? Do you like eating outside? Do you like entertaining outside?
- D) How much time do you want to spend on working and maintaining your outdoor space?
- E) Do you have any special needs or things you would like incorporated in the outdoor space?

The first and probably most important thing is locating your outdoor space on the most private part of your site. You probably won't use an outdoor patio or portal if it is right on the road or your neighbors look right at you. I have found people are most comfortable when they feel a certain amount of privacy. Privacy can be achieved in other ways besides just location. Strategically placed evergreens can provide a year round screen as can a properly located fence. Vines can also be used on a trellis to provide enough screening for comfort. When considering location also keep in mind orientation. A dark cold space will not be used much, but a nice light sunny space will. This means locating your outdoor space with a southern angle is important. It can be turned towards the east or west and still feel like a warm space. If your space is facing south it will also be nice to have a shaded area, a few ways to achieve this are:

- 1) A roofed portal
- 2) An awning
- 3) Trellis work with either plant materials or fabrics to diffuse the sun
- 4) A heavy tree canopy formed by a grid of trees
- 5) Locating parts of your house such that they cast shadows to create shade

Southern orientation also has a lot to do with healthy plant growth and certainly if you're going to incorporate a vegetable garden exposure is imperative.

When developing your outdoor area first answer the simple question of what you want to use it for. There is no reason to build an 8'-0" deep portal that you could have a table under if you do not like eating outdoors or do not expect to entertain outside, though for resale it may be a consideration. By the same token there is no reason to have a 600 square foot deck if you do not expect to use it, in other words just build what you need to use keeping in mind your needs may change and you may want to expand those spaces in the future. One thing I think that adds a lot to any outdoor space is some kind of water feature, whether it be as simple as a birdbath or as complicated as a fountain (re-circulating preferably so the water use is minimal). The sound of water is a great pleasure and personally at our office we have a small fountain on our outdoor deck which is really soothing and a great place to just go mellow out.

Having created all this great outdoor space let's make sure you have the time to maintain it. There is no reason to plant a beautiful (preferably drought resistant) garden that you do not have time to keep up. Look at the particular plant types you are going to introduce and get an idea of what each requires for maintenance then add all these together to figure how much time you will need to spend for maintaining and probably most important - it's water use.

With a beautiful and usable outdoor space, the other important consideration is being able to see this outdoor space from the indoors. Use French doors and sidelights to exit onto the outdoor areas so you can see through from the inside out. Make windows low so when sitting in a living room or eating space you can look at the outdoor area. Even connect the Master Bedroom and/or other bedrooms to the outside so these rooms can also enjoy the space created outdoors. Above all, use and enjoy this outdoor space to it is fullest and enjoy our great southwest environment.

10. CHOOSING A BUILDING SYSTEM

You have just acquired a beautiful site of NM 14 between Cerrillos and Madrid. You have interviewed three or four architects and have picked one you are going to work with. You have met with the Architect on the site and discussed your program (what you want in the house) and budgets. It is now time to make that tough decision on which building system to use.

The choices are many in this day of alternative and traditional building materials. The choices are usually made by taking into account budget, desired aesthetics (wall thickness, etc.) type of finishes (both interior and exterior). Though the choices are many (wood frame, adobe, steel frame, straw bale, pumice, rammed earth or poured concrete) these choices can immediately be reduced by determining a budget. Always at this stage these numbers are created on a square footage basis. A client wishing to spend under \$100/sq.ft. will usually be limited to either wood or steel frame choosing these systems will insure your contractor can keep you within budget. In the \$100 to \$110/sq.ft. range you can probably choose between straw bale and pumice. When you get into the over \$110/sq.ft. range your going to be able to choose between the more labor intensive building systems like adobe, rammed earth. Making the choice for budget reasons unfortunately is the proper approach. Why promise yourself something that when it comes down to it you may not be able to afford.

Aesthetics are something that often people mention in describing the house they want. "I like those beautiful thick walls, can I have them in my house"? These thick walls come at a cost and this should be discussed in determining the system. Thick walls can be done economically with frame walls by just increasing the dimension of the stud you use or even by doing a double stud wall with the outside stud wall being load-bearing and the inside wall being non-load bearing. Thicker walls come naturally to materials like pumice (which is required to be a minimum of 12" just to meet regulations on insulation) and adobe which has a thickness of 10" one way and 14" the other way. You can have double adobe walls which will be up to 30" thick.

Another important aesthetic consideration is whether the client wants a more classic adobe look or a more contemporary look. To get the sharper more crisp look of a contemporary home you should use materials that are dimensioned and true like a metal or wood frame or even cast concrete in which the forms you pour the concrete into are flush and true. For the more classic adobe look using looser materials with more dimensional irregularity like adobe, straw bales or even rammed earth will give that look.

Obviously the formula about making a choice on building systems requires much thought and though finishes seem not such a large factor in determining a building system they alone can make or break a budget. Lots of money can be saved by making such simple decisions as plastering only in the dining room, living room, master bedroom and not in the kitchen, second bedrooms, or bathrooms. You wouldn't have this choice with exterior walls of adobe or straw bales which would require interior plaster even in a bathroom with an exterior wall. Other considerations to take into account are source of building materials (is it environmentally sound), thermal efficiency of the system chosen and climatic and orientation considerations.

Once all these factors have been reviewed and weighed, I think the appropriate building system can be chosen and you can actually start designing your residence.

11. SLOPED vs FLAT

Mention the word "roof" in Santa Fe and your bound to hear cussing and cursing about leaky flat roofs. The biggest complaint is because their roof is flat and water stands on top this leads to leaking. True enough most roof leaks are caused by inadequate slope, but many times the way a roof is detailed or built by your builder/roofer is the reason your roof is leaking.

First and foremost no roof should ever be flat. The Uniform Building Code requires a minimum slope of 1/4" per foot. The old way to get this slope was by just locating the big end of the viga on the high side of the roof. The problem with this is that you can not guarantee that the slope will be consistent or that water will not pool at flat spots over the vigas. The other option that was commonly used was literally putting dirt on top of the wood decking and raking it to get the slope. This provided slope but did not provide insulation as required by the energy code. This process was replaced by putting pumice on the roof and getting both slope and insulation with the pumice. Once again the slope of the roof could vary (depending on the raking job) and any roof leaks could go undetected because it would be soaked up by the pumice. This form of system is still allowed in the County but is no longer legal in the City of Santa Fe.

The three most effective systems to achieve slope and provide for controlled drainage are tapered insulation systems, a built-up pocket roof or ripped 2 x's on top of roof structures without exposed beams or vigas. The tapered roof insulation is the most expensive system and is a custom roof system that is designed for each application. It provides consistent slope, but because it is custom the price is high. It also does not allow for recessed lights (unless you build boxes at every light location) which is important in beamed ceilings.

The pocket roof is the choice of most residential applications because of its economy and usefulness. This system consists of building 2 x 4 walls and framing on top of the beamed ceiling structure. This creates a pocket (depth depends on the length of the roof) in which regular batt insulation can be put into and recessed lights (with thermal housings) can directly be cut into the ceiling without penetrating the roofing itself.

A variation of this is the third system which you use with 2x joists or truss joists. In these systems you take 2 x 12's and cut them consistently to form the slope. You then simply nail them to the tops of the 2 x or Joist and you have your slope built-

in. The batt insulation and lights can be installed in the voids between the roof structure. The last two systems are what we typically use, but there are some details that are common to all three systems that I'd like to discuss further.

The parapet will make or break a roofing system. If the parapet is not high enough (must be 16" to 24" above the roof) snow and/or water will collect against it and cause damage. Just driving around town you can see what happens if a parapet is too low, the stucco cracks and breaks off and probably the roof leaks along the parapet. Two other items to keep in mind when building parapets is 1) the roofing's last layer (90# felt) should go over the top of the parapet about 12" to protect the parapet from moisture and 2) slope the top of the parapet towards the back not towards the front. By sloping the parapets towards the roof you insure that the front wall will not be stained by water draining off the parapets and that the stucco will not crack at the tops of the parapet which can lead to water infiltrating into the walls below.

Another problem that must be addressed when doing the parapets is insuring water does not drain against the parapets. This is achieved by installing 4" cant strips on the high side of the roof, the parapets parallel with the sloped roof and providing crickets on the parapet on the canale side. A cant strip is a 4" x 4" triangular piece of wood or fiber that keeps water from traveling along the side of the parapet. A cricket is actually a sloped surface that diverts the water towards the canale and away from the parapet, a cricket usually projects 6" - 12" from the face of a parapet. Crickets are also important on the high side of skylights or mechanical equipment to deflect the water.

Canales are also a natural weak point in every roof. They are where all the water has to travel through to exit the roof and thus must be installed correctly or they will leak. The roofing must extend almost to the end of the canale and up the sides of the parapet a minimum of 12". The canales must also be designed to drain the right amount of roof area. Canales can drain 1000 square foot of roof area, often you will see 4 or 5 canales draining only 1000 square feet, when one canale would be adequate and also reduce your chance of leaks at the most common roofing connection failure point. I also use only copper lining in canales on my jobs, this adds another level of security and added life to the canale.

12. ROOFING CONTINUED

With all the options available for roofing materials how do you make a wise decision on which to use. To be able to make this decision you must first know the pros and cons of the various roofing systems available. The two kinds of roof types can be described as those that slope from 1/4" per 12" to 1" per 12" and those that slope from 1" per 12" to 12" per 12". Roofs that slope between 1/4" and 1" per foot are typically roofed with sheet or roll materials. Roofs that slope from 1" to 12" per foot are typically roofed with tiles, metal roofing or shingles.

Sheet or roll materials include the standard built up roof, single ply flexible roofing and single ply EPDM roofing. Standard built-up roofing is what is used typically in Santa Fe. It is typically a base sheet (either organic or felt) with 2, 3 or 4 layers of felt sheets and a cap sheet which may have gravel applied on top or a mineral surface applied by the roofing material manufacturer. The base sheet is nailed to the roof deck with the subsequent layers of felt sheets applied with either hot asphalt mopped on or a mastic glue to fasten the layers to themselves and the base sheet, the cap sheet is applied in a similar manner. This roof system is typically warranted from 3 to 7 years but it's life may extend up to 20 years without replacement. It's extensive use can most probably be attributed to it's lower cost and ease of maintenance due to widespread knowledge of this system and the ability of the homeowner to work on this type of roof.

Single ply flexible roofing is typically made of polyvinyl chlorides that are altered chemically to form a flexible membrane. It is applied over a roof deck or insulation by either welding the seams with heat or using glues or mechanically fastening it to the deck. Gravel is typically place on the welded type installation to literally keep the roofing from blowing off. This roofing material was developed initially for large commercial roofs where large square footage's of area require some flexibility to cope with the stresses of expansion and contraction due to temperature changes and the minor but inherent movement in structural materials. This system in the last 15 years has also been used in residential applications because of it's low maintenance and long life, but because of it's special installation requirements only certified applicators can be used.

EPDM roofing is also a single ply flexible roofing but instead of being PVC based it is elastomeric in nature. Elastomeric means flexible and is made of ethylene and propylene. This

roof is applied similar to the other single ply roofing previously discussed and has the same advantages. Some disadvantages are that methods of application vary greatly among the different manufacturers and close supervision is needed during the installation. If not installed correctly this roof system will not function correctly.

In summary, of these three systems the built-up roof because of it's universality and availability is what is usually used. If a multi-ply roof is sloped and installed properly you will get many years of life with out the initial high cost of the single systems.

Those systems available for roofs with slopes over 1" per 12" are quite numerous. Metal roofing is commonly used in New Mexico and many different types of metal roofing are available from the prefinished propanel to solid zinc panels that are custom rolled and installed. When installing metal roofs there are a few things that I've found need to be watched. First where different slopes of roofs meet much care must be taken in the detailing to insure that such things as the overhangs align and that the valleys are properly flashed. Secondly that any dissimilar metals not be in contact with themselves. Dissimilar metals in contact with each other can lead to electrolysis which can corrode a metal roof. Thirdly, that all required venting be provided for the roofing area. Fourthly and probably most important is that the metal roofing be applied per manufacturers recommendations. On as aesthetic note please use low reflective metals or finishes so your house is not visible from a hundred miles away. A correctly installed metal roof should last a lifetime.

Clay tile though not used much in New Mexico is also a product when installed correctly can last 100's of years. This is evidenced by the many historic structures in Europe that still have their original clay tile roofs after centuries. Asphalt and slate or stone shingles are another roofing system not used much in this region, but that will last many years.

The key to choosing and using a roofing system lies in economy, proper installation and maintenance. Economy in the sense that there is no reason to pay more for a roofing system that is not necessary for a normal or standard installation. Proper installation by a certified installer insures the full life of the material specified will be realized. Maintenance is also important in any roofing installation and this is as simple as doing a yearly visual inspection and assuring such things as canales, drains and gutters are clear of debris. A roof doesn't have to be a continual source of problems.

13. RESIDENTIAL HEATING & COOLING

The architect recommends an in-floor radiant heating system. Why was that recommendation made? That question is often asked by our clients and many times a lively discussion occurs over the pros and cons of the different systems that are available today. I'd like to discuss the pros and cons in this month's article.

In today's residential construction owners have upwards of seven directions they could take. I'll start with one of the most commonly used systems in the Santa Fe area. This is the in-floor radiant heating system. This system consists of a remote boiler to heat the water which circulates through "pipes" placed inside a concrete slab. This makes for "warm" floors and a very even heat distribution. The pipes in the slab are either copper or a synthetic polypropylene fiber reinforced tube. They are placed in the slab about every twelve inches, but by exterior glass doors or windows they are typically spaced at nine inches apart. Different heating zones within the residence are achieved by valves which control the amount of hot water flowing into the different zones. Probably the most important point to inform you of is that with a radiant system you have no real air circulation, you must rely on fans (which I recommend installing in all main rooms including bedrooms with a radiant system) and the ability to have cross ventilation from windows in every room. This cross ventilation is important to keep in mind in the preliminary design of any residence no matter what heating system is chosen. One other consideration in a radiant heating system is to spend the extra money to put rigid insulation under the slab which maximizes the efficiency of the radiant system.

Another common heat distribution system is baseboard heating which can either be electric or hot water. Electric baseboard is the least efficient of the heating systems and I would only use it in accessory structures such as storage areas or maybe even a free standing studio where the distance from the main residence precludes tying into it's mechanical system. Hot water baseboard utilizes the same type boiler as a radiant system but it's heating elements are exposed and located usually under windows or along cold walls (those facing North and East) where heat loss occurs. This is an economical choice for radiant systems and provides the same nice comfortable heat. Sometimes in two story applications, in-floor radiant is used on the first floor and baseboard is utilized upstairs where

there are no concrete slabs to conceal the radiant pipes. The one main disadvantage to all three of these systems is that between the time you adjust the thermostat and the time the radiant or baseboard heaters adjust themselves to the new temperature setting be hours. Many clients do not use these systems for this one reason.

One of the cheapest and commonly used systems in remodels or additions is wall or freestanding heating units. These are typically gas fired and installed either recessed in the wall or freestanding in a corner of a room. Many times these are used as a back up system for active or passive solar systems where the need for heating may happen only on the coldest, cloudiest days of the year. Installation requires only a gas line to the proposed location and a vent to the exterior.

HVAC systems (Heating Ventilating and Air Conditioning) are gas fired (they can also be electric) heating units that heat outside air and distribute it through the residence by ductwork either under the floor or in the ceiling above, or exposed on the roof. A condenser and humidifier can be added to this system to provide either air conditioning or increase the humidity in a house. The advantages of this system are instant on-demand heating and cooling, the ability to circulate outside unheated and uncooled air throughout the house and for many people with antiques and important art collections humidity control is required. This humidity control is required because in our dry climate with so little humidity wood furniture can literally dry up and crack, by introducing humidity you can prevent this kind of damage. The disadvantages to this system are uneven heat/cooling distribution because the air comes through at single points, no warm floors and it's higher initial cost with (air conditioning and humidifiers) than radiant heating to install.

The other cooling option used and usually used only in radiant or wall heater applications is evaporative cooling. Evaporative cooling is typically a square enclosure with filters on four sides and a fan inside. Air is pulled from the outside through the filters (which cools the air by moving the air over the wet filters). Many times we will locate evaporative cooling in the kitchen (where a lot of heat is generated by appliances) and possibly in the Master Bedroom. Evaporative cooling is a low technology and cost effective alternative instead of a central air conditioning system and should be considered.

The most cost effective way to heat a house is still passive solar. This option requires no electricity or gas usage but by simply orientating your house correctly and supplying enough glazing to the South, heat gain is achieved and the spaces are heated naturally. A caution with passive solar is that any standard home mortgage also requires a back up heating system and overhangs over the windows must be provided to shade the house from the hot summer sun. Window treatment can also help control the amount of solar gain and once again ceiling fans are important for air distribution.

Active solar systems are typically done with exterior panels on the roof which run water through them, heat up the water (which is stored in a insulated tank in the house) and a pump to distribute the hot water through the house for both heating and also for domestic hot water needs when the system is set up properly.

All these systems have advantages and disadvantages and each must be discussed with any potential client to determine which system will best serve them. Certainly on larger residential and commercial jobs a Mechanical Engineer should be hired to do preliminary evaluation and drawings to describe the proposed new mechanical system.

14. LIGHTING PART I

Windows are installed in houses so daylight and the view beyond becomes part of the experience in a house, but when the sun goes down and darkness falls it is time to flick a switch and use lighting for your nocturnal needs.

Artificial lighting is a very important part of any house and how this is dealt with in the design process will determine whether you end up with a dark, uninviting house at night or a well lit interesting and inviting space.

I would like to discuss the lighting options available and how they can be applied to your new residence. First of all, the use of the room will determine the required level of lighting which in turn will determine the type and quantity of light fixtures to use. For example a bedroom requires light at the bed for reading but otherwise you do not need to be able to read anywhere in the room so the rest of the room can have low levels of lighting. Another example is a kitchen where there is constant activity a real need for very high levels of both natural light and artificial light. So I would suggest making a list of the rooms to be incorporated in your new residence and the probable uses in these rooms (reading, sleeping, eating etc.). Once this is done the level of lighting can be determined and then the type and location of fixtures can be done. Keep in mind when doing this list that some rooms may have multiple needs, for instance, a desk and phone area in a kitchen may require task lighting for the desk.

The types of lighting fixtures available vary from recessed down lights to surface mounted spots for lighting walls or particular art pieces.

Within the family of recessed ceiling mounted cans you can have:

- 1) Cans that strictly project light down for area lighting.
- 2) Cans that have reflector lamps and lenses that can wash large areas of walls or surfaces.
- 3) Cans that have adjustable reflectors and lamps that can accent specific objects or smaller wall areas.
- 4) Cans that have adjustable reflectors and lamps that wash large areas of walls.

Using these can types in different numbers and locations can make for a very interesting lighting layout.

Surface mounted lights also have many different types available over the shelf. There are:

- 1) Surface mounted cans for area lighting.
- 2) Spotlights that are mounted on stems to accent walls and objects.
- 3) Surface mounted tracks with cans or spots attached.
- 4) Surface mounted fluorescent fixtures.
- 5) Pendant type fixtures that mount to the ceiling and extend below the ceiling to do either area or spot lighting.
- 6) Wires that attach to ceiling and carry low voltage that allows you to hang fixtures anywhere along the suspended wires. (This is mainly used in high end commercial applications).

With both recessed and surface mounted lights in any application the choice of bulbs is another very important choice. Incandescent lamps are the most often used but within this type of lamp are many variations. The standard bulb that you buy off the shelf is the general service type. They can range from 15 watts to 1500 watts. Their shape is either the standard globe shape or the pear shape. PAR lamps are incandescent also, but have built in reflectors, thus the designation PAR which stands for parabolic aluminizer reflector. These are shaped like spotlights and used when good light and maximum reflection of light down is required. Halogen bulbs are typically smaller than most other types and have great light quality (good color, good optical light control).

They are used a lot in smaller fixtures and with high end lighting applications. Mercury vapor, metal halide and high pressure sodium bulbs are typically not used residentially so I won't talk about these.

With all the above choices you must wonder how to make the choice? First of all only spend money on expensive fixtures where you'll get the maximum use and most "bang for your buck". Put expensive fixtures in the public spaces where all can enjoy, like in the living room or dining room, but remember when buying these fixtures look at the cost to replace the light bulbs. I have seen in my years clients replace PAR bulbs with regular incandescent because they were cheaper, so the money spent for a nice fixture is negated when the bulb dies and a cheap bulb replaces it.

Secondly in some rooms you don't need recessed or surface mounted lights, a floor or desk lamp will be just fine without

doing any lights above. Many times in bedrooms we just put an outlet on each side of the bed and a switch connected to it by the entry door so when you walk in the bedroom you can just flick a switch and the lamps next to the bed will come on. This allows for reading and enough light to move comfortable around the room.

Thirdly, do not put too many lights in your house. Pools of light are much nicer than having the institutional feel of light flooding onto all surfaces. Pick those walls where you might have art or another type of object you would want to accent and use some nice recessed or surface mounted light fixtures.

Finally as stated before determine the mood you want to set for the space and do it with appropriately specified and located fixtures.

14. LIGHTING PART II

The last article discussed lighting in general related to what light fixture types and bulbs are available. We also touched on the fact that different rooms require different levels of light. In this month's article I'd like to discuss actually laying out the lighting in a kitchen, living room and bedroom of a typical residence.

Kitchens have become one of the most important people spaces in a house. Light must be provided for many different activities; reading, food prep, doing dishes, cooking and the list goes on. When laying out lighting in a kitchen I start by providing general area lighting over the circulation areas and around the perimeter of the room. This is usually done with recessed down light cans. I then proceed with locating areas which require special lighting. Two areas I always wash with lots of light is the sink area and if there is an island or peninsula I locate recessed downlights over these areas to insure you have plenty of light to work. Where we have counter space under upper cabinets I always locate strip florescence or strip halogen lights under the upper cabinets so all surfaces are well light where food prep may take place. If you use halogen strip type lights you can incorporate dimmers which can make a kitchen quite a nice space. Be sure your upper cabinets have an apron on the bottom so your lights are not visible and are concealed behind this wood trim or apron.

If the kitchen has a desk area make sure you have a light directly above it or some strip lights mounted to the underside of the upper cabinets so the desk has plenty of light. If the kitchen has a walk-in pantry I like to provide plenty of light and a nice trick to do is to put the light switch in the door frame so every time you open the door the light automatically goes on. This saves you from looking for a switch with your hands full.

On to laying out the Living Room. I always start by determining where the main seating arrangement is going to be. Above this seating area I locate some downlights so a pool of light is formed over the couches, coffee table and lounge chairs. Typically, I also locate a floor outlet and floor phone outlet so you can plug in a lamp or phone by the seating arrangement. Some Living Rooms will also have a games table or possibly just two chairs and a table for reading. I also locate downlights above this area.

If the Living Room has a fireplace I always locate a spot light preferably switched separately to accent the face of the fireplace. I also sit down with the owners and determine which

walls will have art on them and either locate track lights or accent lights. Care must be taken in locating these accent lights to insure there are enough fixtures and they are far enough off the wall to shine on the art piece. If there are niches I also locate real small light fixtures inside so pots, kachinas or what ever is inside is accentuated. Other nice touches are: 1) Locating a recessed downlight above a series of glass shelves so one light will shine through all the shelves. 2) With solid shelves putting in small strip lights at the edge so each recessed shelf is well lite. 3) Putting dimmers on everything! 4) Lighting all four corners of the room so they are not dark. 5) Locating the controls to the outdoor lights so they can be controlled from the Living Room. 6) Locating a ceiling fan in the room for air circulation. (Do not locate recessed lights near fan or you will get a strobe light effect).

The bedroom layout is a more personal choice. Do or you read before you go to bed are there any special activities that occur at night in the bedroom that requires special lighting? Ask yourself these questions and then your ready to proceed. I always start by locating the bedwall and an area for a casual seating area to dress or read in. At the bedwall I determine whether the client prefers lamps or overhead lights to read by. If it is lamps I typically locate switched duplex outlets on either side of the bed with the switches next to the bed at arms reach or by the door entering the bedroom. If you do use in the ceiling lights be sure to either have lenses or offset the lights so they are not shining down directly into your eyes. If the house is not air conditional I locate a ceiling fan central to the room but always watch where the bed and fan are located because you could get hit by the fan blades if for some reason you may be standing up in bed.

Opposite the bed wall is probably where a TV or stereo might be located so I always provide power, cable outlets and possibly a light to help read the controls on the TV or stereo.

In the area where there is an informal seating area I locate lights above to allow for reading, dressing or any other activities. As in the Living Room it is nice to have control of the exterior lights from the bedroom so in case you need to light up the exterior from the safety and comfort of your bedroom. See attached copy of a proposed Master Bedroom layout. I hope this has been informative to helping you see how to provide different and required types of lighting in different spaces.