Space Planning

*Figuring Square Footage

An important aspect of space planning is the ability to figure square footage. Square footage is determined by multiplying the length of a room by the width. Therefore,

L x W = square footage or sq. ft.

Example:

A room is 10'-0” x 12'-0”

Multiply 10 x 12

= 120 sq. ft.

Example:

A room is 10'-3” x 12'-9”

Convert the inches into decimal

10.25' x 12.75'

= 130.6875 sq. ft.

Square footage or areas are usually figured in whole numbers. Simply round up or down to the nearest whole number, in this case, 131 sq. ft.

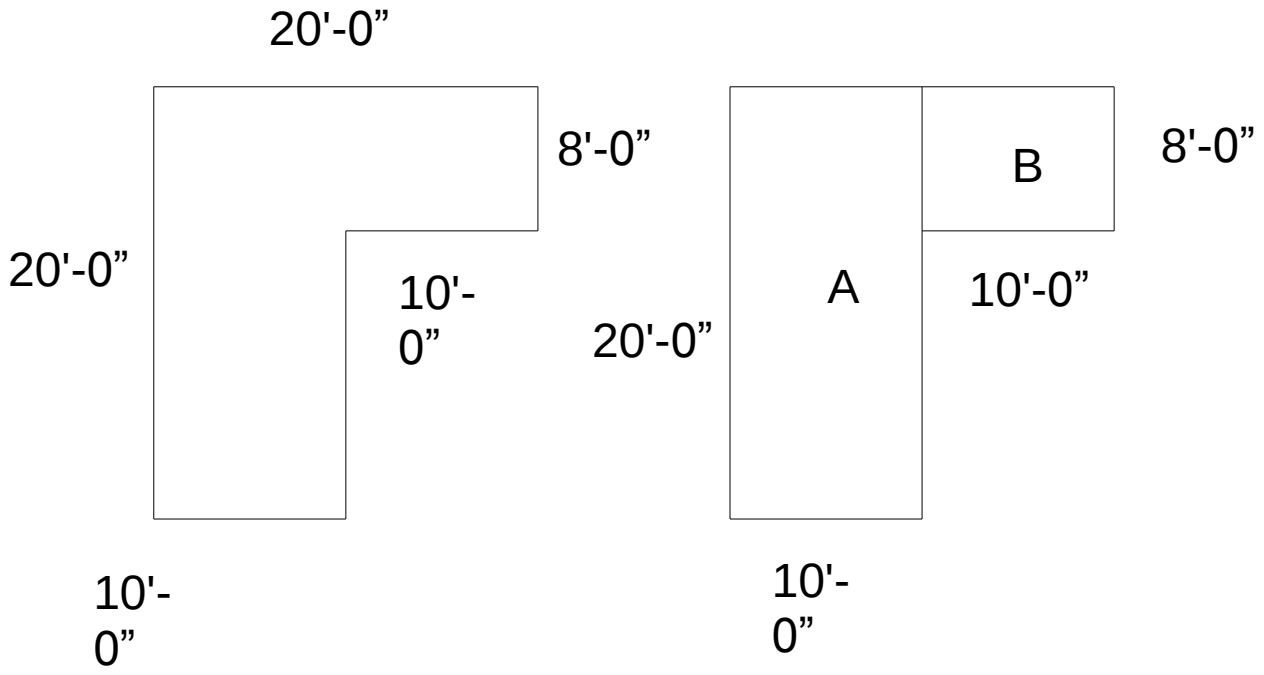
Figuring Square Footage

Determining Square Footage in Odd-Shaped Rooms

1) Dived the room into two separate rectangles

2) Figure the square footage of each space
A = 10'-0” x 20'-0” = 200 sq. ft.
B = 10'-0” x 8'-0” = 80 sq. ft.

3) Add the totals. The total square footage is 200 sq. ft. + 80 sq. ft. = 280 sq. ft.



Figuring Square Footage

Determining Square Footage of a room with an angle.

1) Divide the room into as few rectangles and triangles as possible

2) figure the square footage of each space:

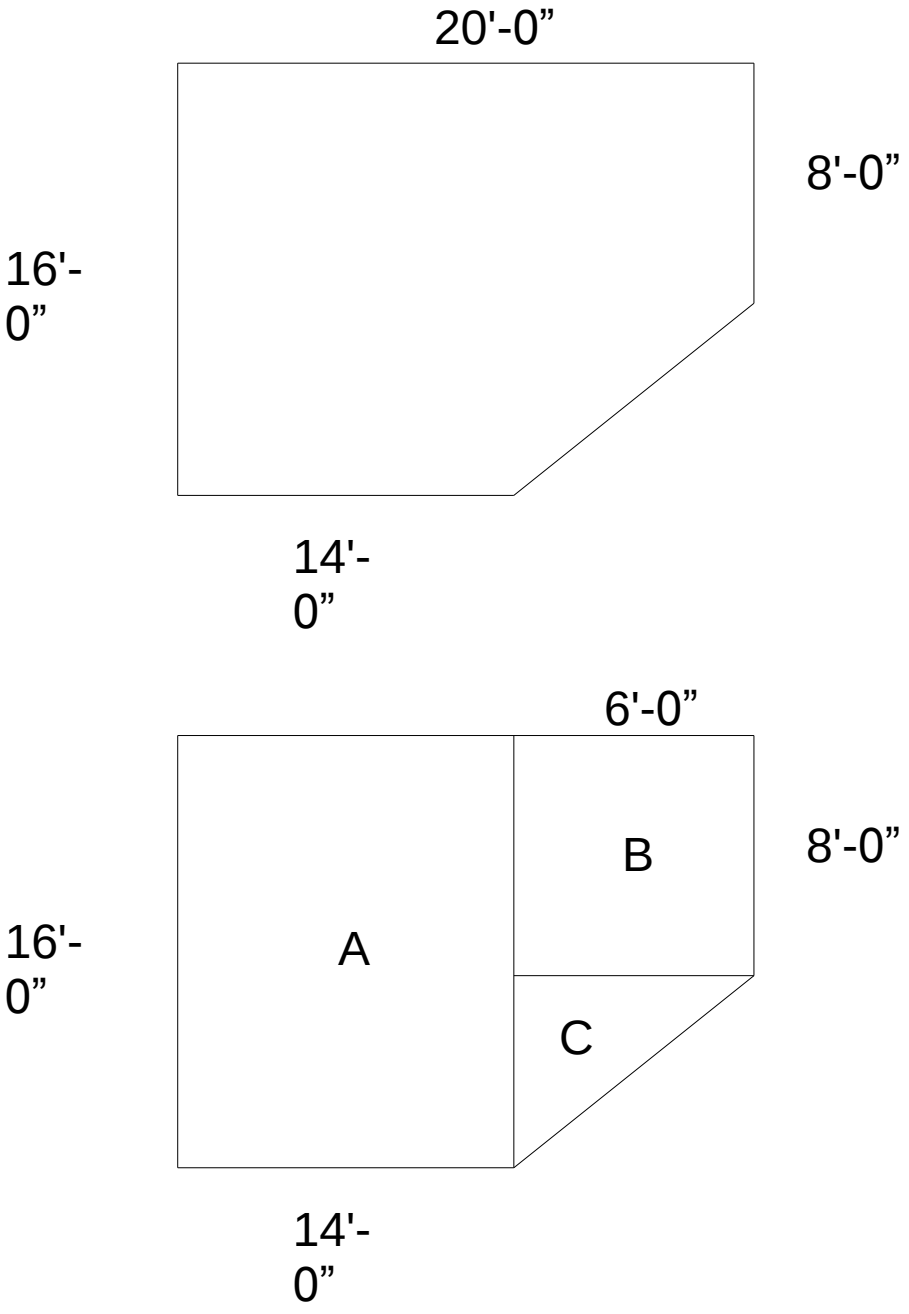
A = 16'-0” x 14'-0” = 224 sq. ft.
B = 6'-0” x 8'-0” = 48 sq. ft.

3) To figure the square footage of C, it is important to know that a triangle is simply a rectangle divided in half. Therefore, multiply the length by the width and divide the answer by 2:

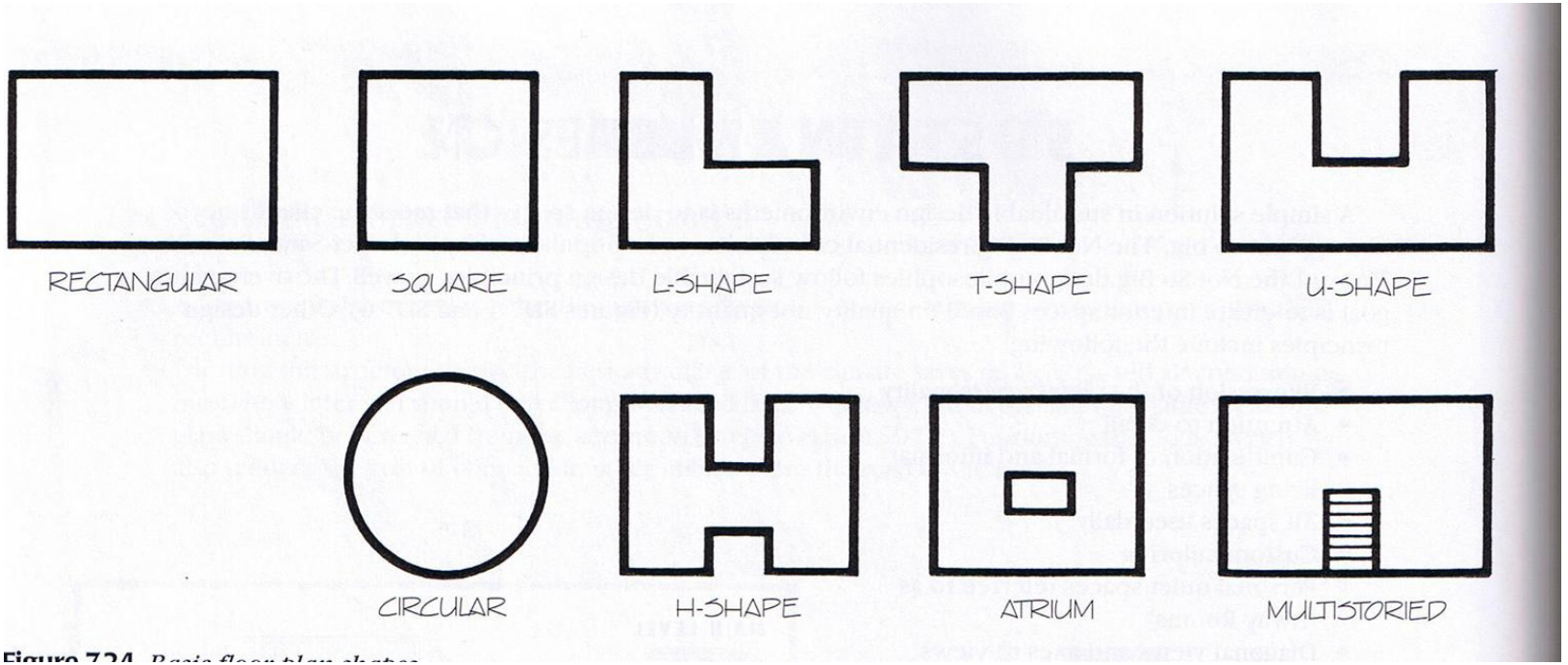
C = 6'-0” x 8'-0” = 48 sq. ft ÷ 2 = 24 sq. ft.

4) Add the totals of the spaces together to arrive at the total square footage:

224sq. ft. + 48 sq. ft. + 24 sq. ft. = 296 sq. ft.



Basic Floor Plan Shapes



These floor plans often have a few jogs, angles, or window extensions that do not change the basic shape of the structure. To serve the client better, the designer should keep these points in mind:

1) The house should be positioned on the site to enhance the landscape. Square and rectangle shapes can be more difficult to position and landscape attractively than shapes with more interesting angles.

2) Each angle and jog of a floor plan shape adds to the expense of the structure.

3) The shape of the residence may affect the interior arrangement of activities.

4) Traffic patters are usually more efficient in shapes with more angles than a square or rectangle offer.

5) Heating and cooling costs are higher with added wings.

6) Shapes with more wings or extensions allow additional light and ventilation in the residence.

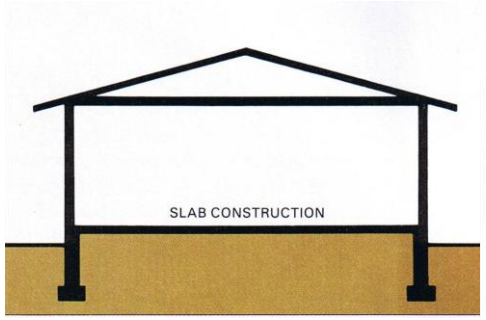
4 House Designs

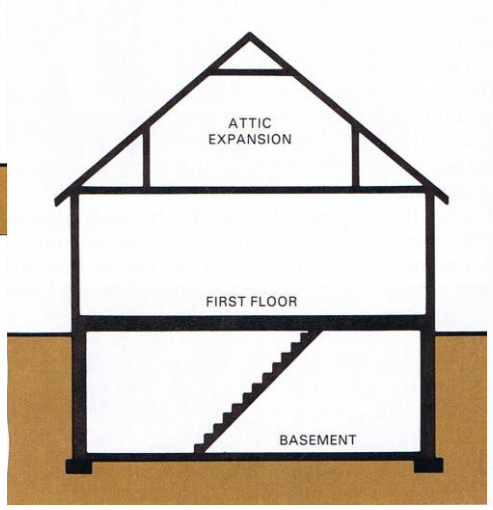
***Ranch Style – It is a long, low, one-story house. The plain ranch design generally has a low pitched roof with gables and overhanging eaves. It is normally built on a concrete slab with no basement. This style cost more to build.**

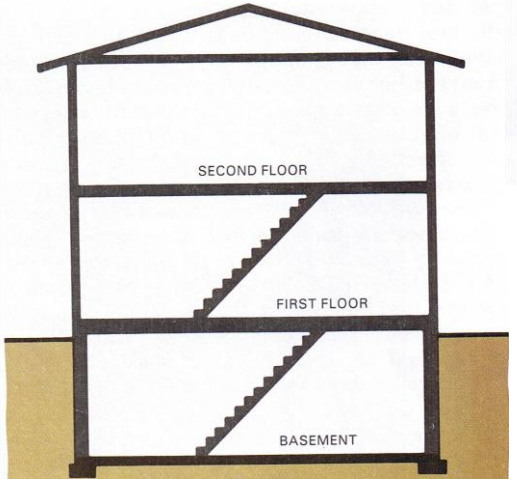
***One and one half story design – It is essentially one-story with a steeper roof which allows for expansion of the attic. Dormers are added to provide additional light and ventilation. Since any space with less than 5' of headroom is considered unusable, the total square feet of space in the attic is one-half the total of the first floor.**

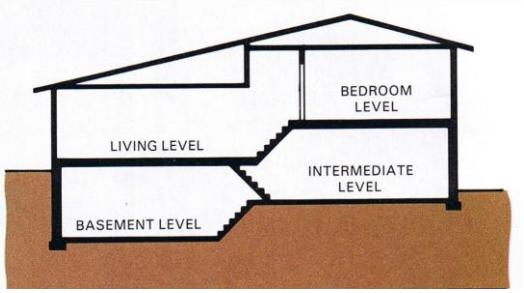
***Two Story – This home has two stories and may be built with or without a basement. A two-story home requires a smaller lot and has a smaller roof and foundation area so it is cheaper to build.**

***Split Level Design – The split-level was conceived for the sloping or hilly lot. The general arrangement of the split-level separates sleeping, living, and recreation on different levels.**









Door size standards

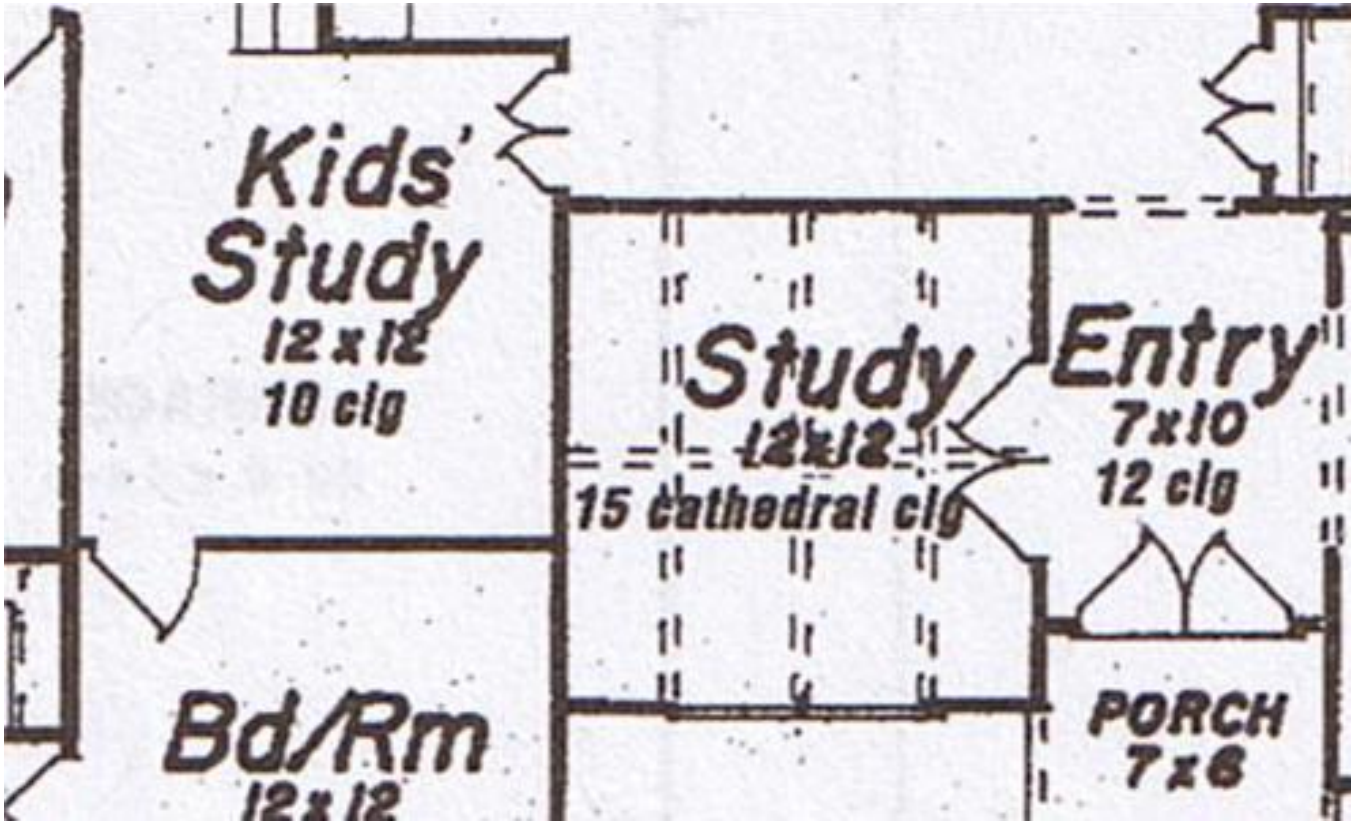
Front Door:
*36” wide
*6'-8” high
1 1/2” thick

Rear Door:
*36” wide
*6'-8” high
1 1/2” thick

Bedroom Door:
*30” to 32” wide
*6'-8” high
1 1/4” thick

Bath Door:
28” to 30” wide
*6'-8” high
1 1/4” thick

Closet (Bifold) Door:
Depends 4' to 12'
6'-8” high
1 1/4” thick



The minimum clearance on the side of a door opening is 3 inches.

*An exterior door must have a light.

*Doors should always swing into the rooms of the house.

*French doors can be used in designing a master bedroom with access to a private patio. They typically are made with glass panels.

Space Planning for Entry Hall or Foyer

In a residential setting the entry serves a a passageway, and like all good design, should not be cluttered.

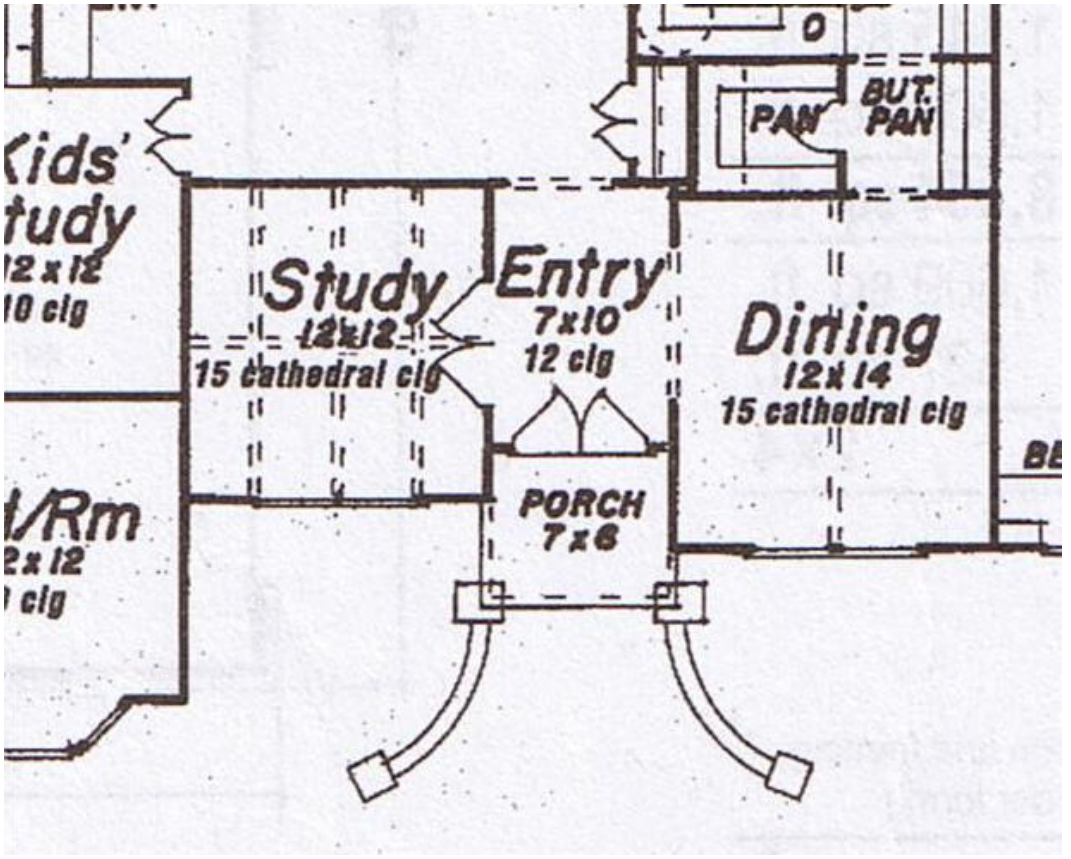
Easy flow of traffic is essential.

Ample storage areas need to be designed to accommodate coats, shoes, packages, and so on.

Entry doors are normally: 3'-0” wide
1 1/2” thick
Standard door height is 6'-8”

Added emphasis may be obtained by using two doors instead of one.

***Minimum hall width of 3'-0”. A width of 3'-6” or 4'-0” is more desirable.**



A well planned entry will provide a covered access into the home as well as a windbreak.

The entry should open into a foyer rather than directly into a living area.

A closet should be provided near the front door for storage of outdoor coats and sweaters.

Space Planning for Living Rooms

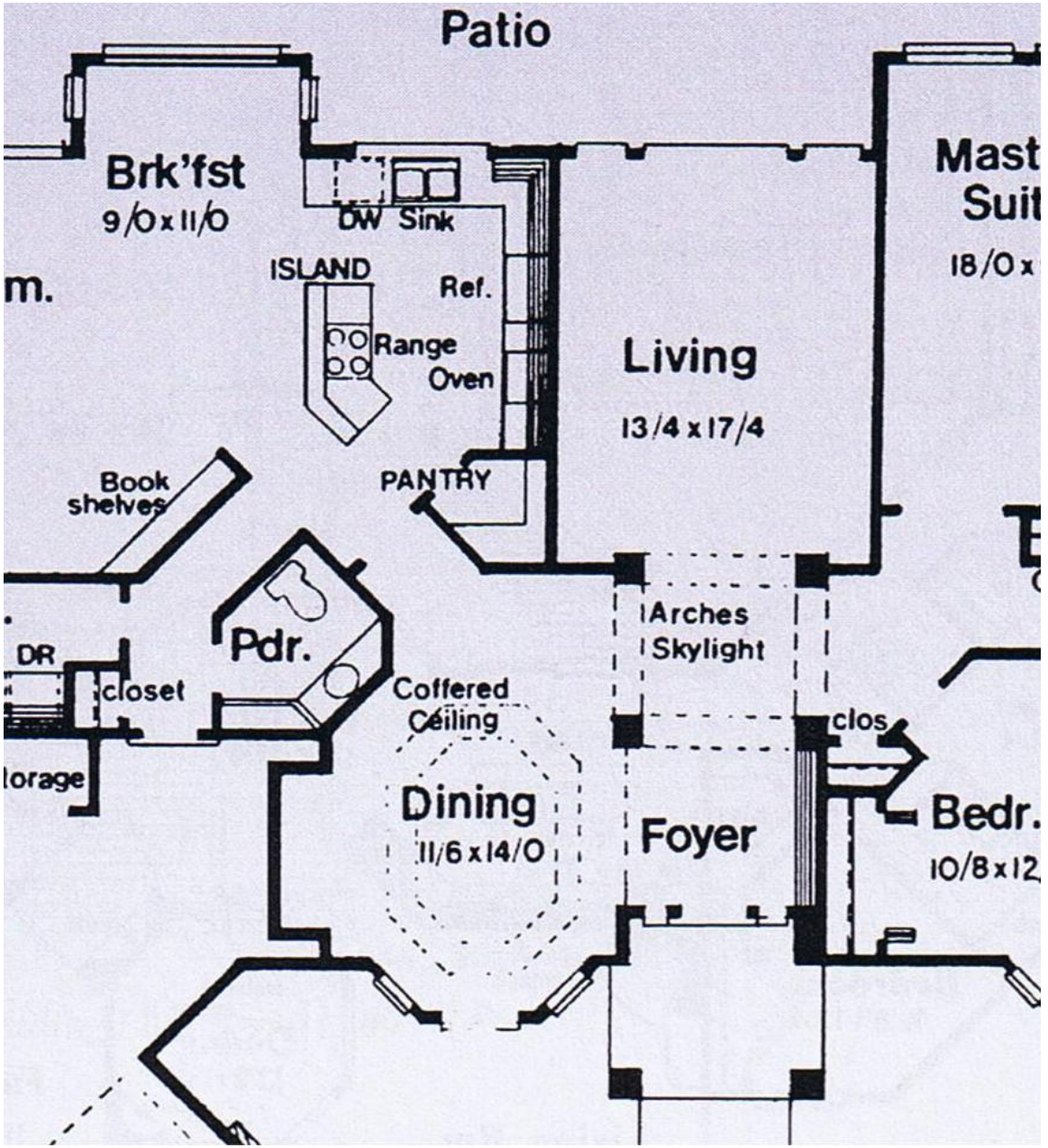
The living room is usually placed near the entry. This eliminates the need for guests having to pass through the rest of the house.

Living rooms can be made to seem larger if attached to the dining area.

A small living room may have as few as 150 sq. ft.
An average size around 250 sq. ft.
a large one may exceed 400 sq. ft.

A common size is 13'x18' which will allow for most furniture arrangements.

A square shaped living room does NOT necessarily mean that furniture placement will be easy.

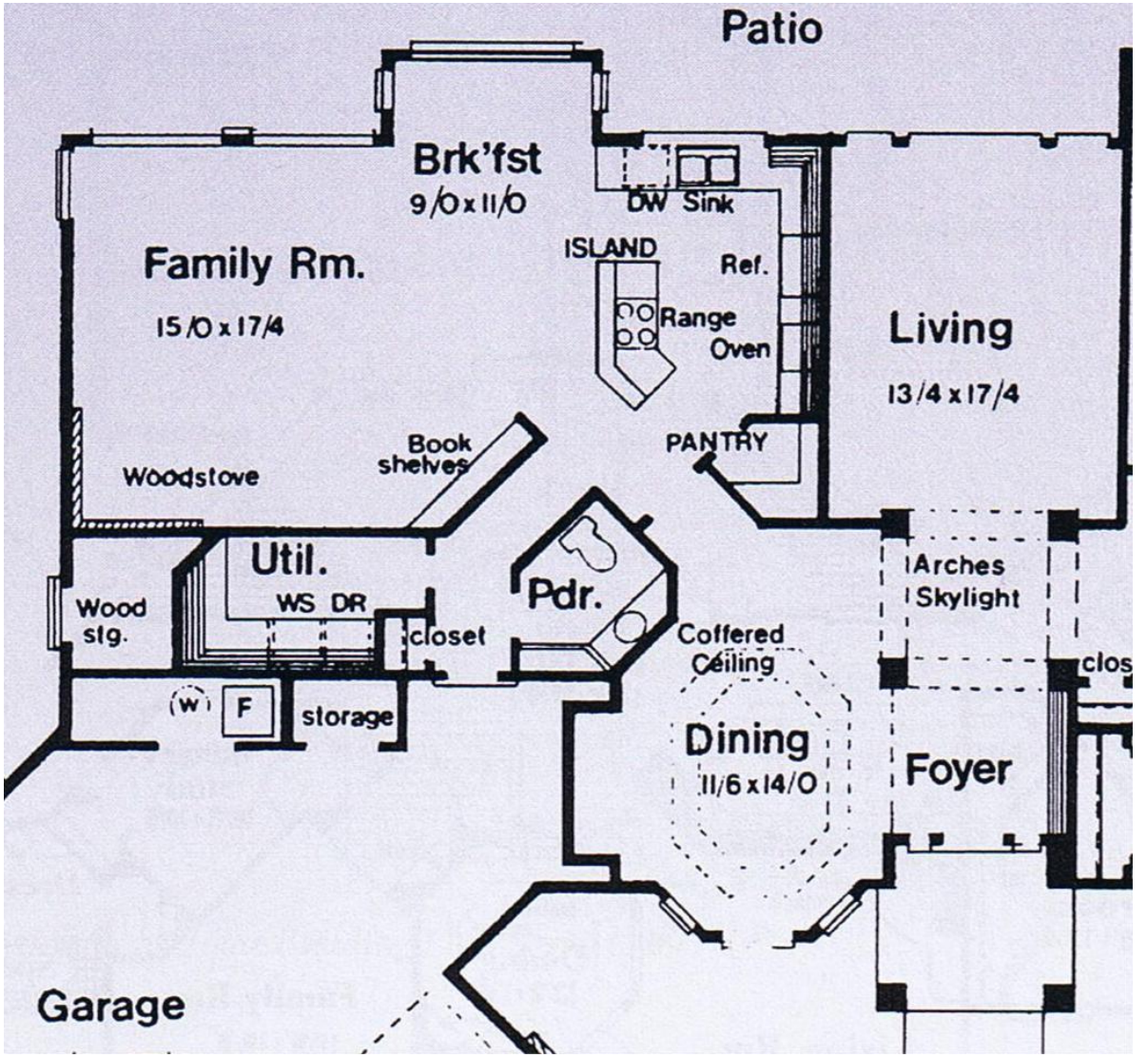


Space Planning for Family/Great Rooms

Family Rooms may encompass many of the basic activity areas; conversation areas, video and television viewing are the most common.

An area of about 13'x16' should be the minimum size for a family room.

When the living, dining, and family room are combined into one area it is called a grand or great room.

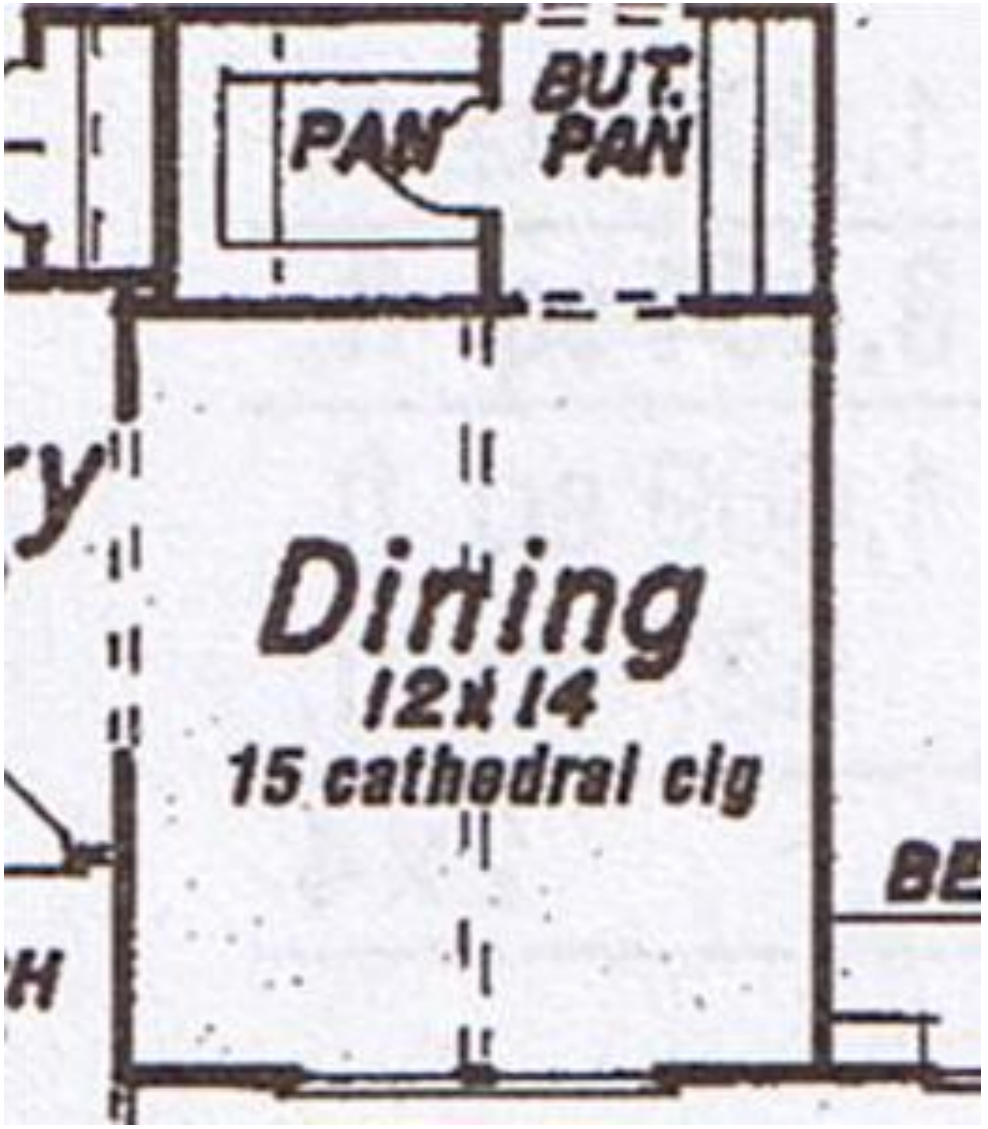


Space Planning for Dining Rooms

***If the dining area is open to another area it can be as small as 9'x11'.**

A formal dining area should be approximately 11'x14'.

A space of approximately 42” between the table edge and any wall or furniture will allow room for walking around an occupied chair at the dining room table.

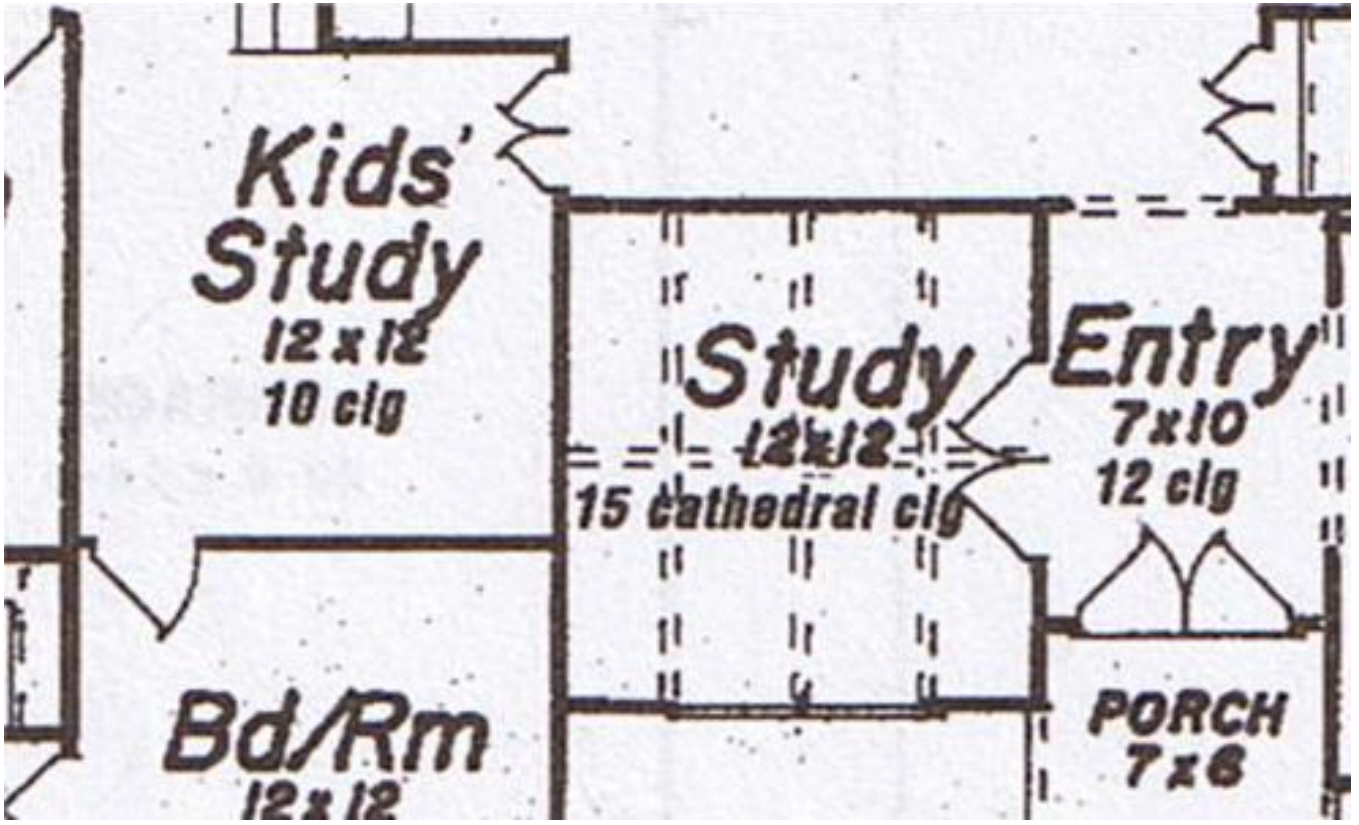


Space Planning for an Office

When designing an office it is best to place the computer at a 90 degree angle to the window to avoid glare. If the computer is placed against the window, the bright contrast between the sun and low-lit screen causes eye fatigue. When the screen faces the widow, an immense about of glare is created. Also, the person sitting at the desk should be able to easily see who is entering the office.

Also, consider the placement of electrical and telephone outlets. Cords should not be strung across the room or hidden by the base molding

A den or study is typically located off the entry and near the living room.



Space Planning for Master Bedroom

The master bedroom has become a refuge from the pressures and stress of everyday living. There may be space for a fireplace, a bar, a television set, a study, a conversation arrangement, an office, and even a physical fitness area. The master bedroom is best located at a distance from all other rooms. It does not have to be adjacent to any other room except the master bath and, if appropriate, a nursery.

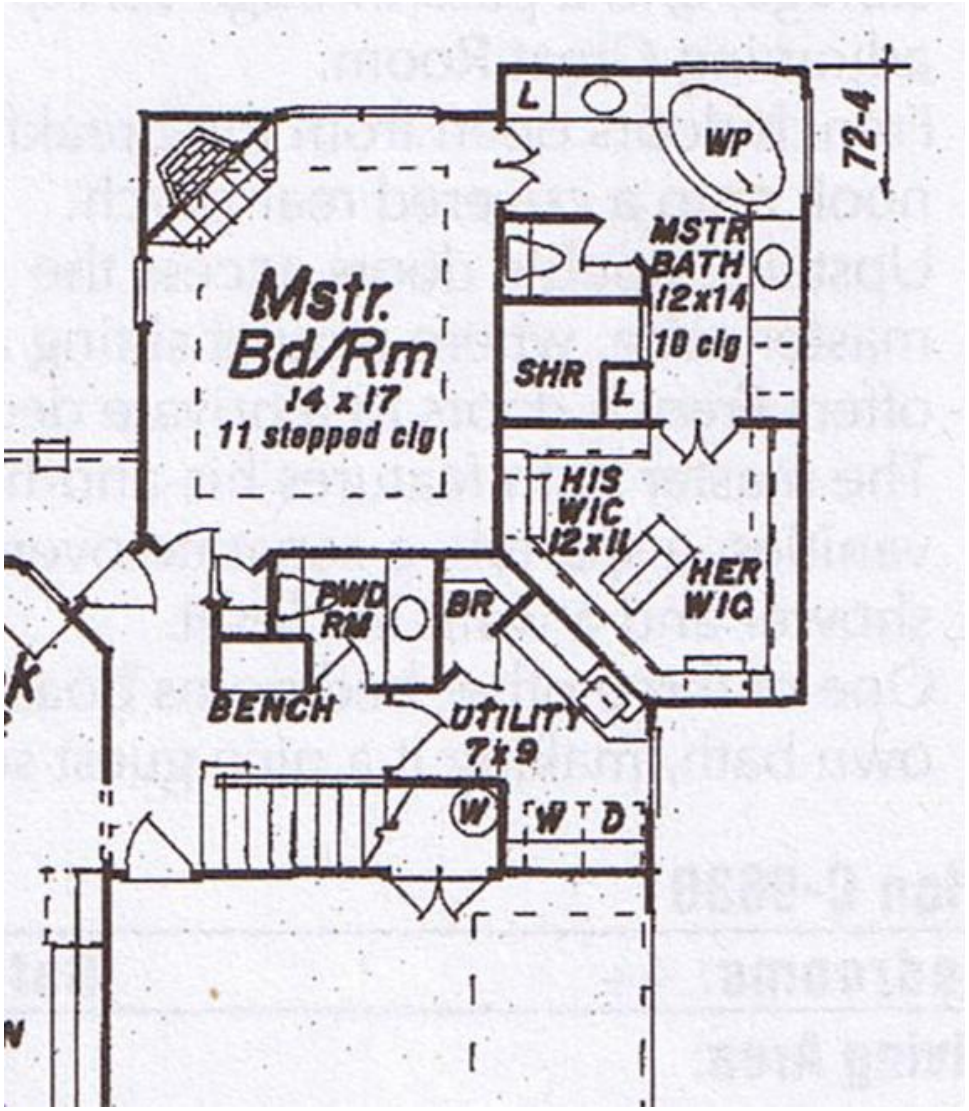
When planning a bedroom size, allow for a minimum of 24” on each side of a bed.

Allow for approx. 36” between dressers and any obstruction.

The master bedroom should be at least 12'x14' plus closet space. More if a sitting or other area is desired.

To allow for periodic furniture movement, try to arrange bedrooms so that at least 2 walls are available for bed placement.

There are 2 reasons for placing bedrooms on the upper level: 1) Heated by convection (movement of air) 2) Quiet area



A walk in closet should be at least 6'x6' in size. A size of 6'x8' would provide better access.

Space Planning for Children or Other Bedrooms

These rooms, like the master bedroom, should be located in quiet areas of the house. Children's rooms require ample storage, access to a bathroom, and perhaps a study or computer area.

The FHA (Federal Housing Administration) recommends 100 square feet as the minimum size

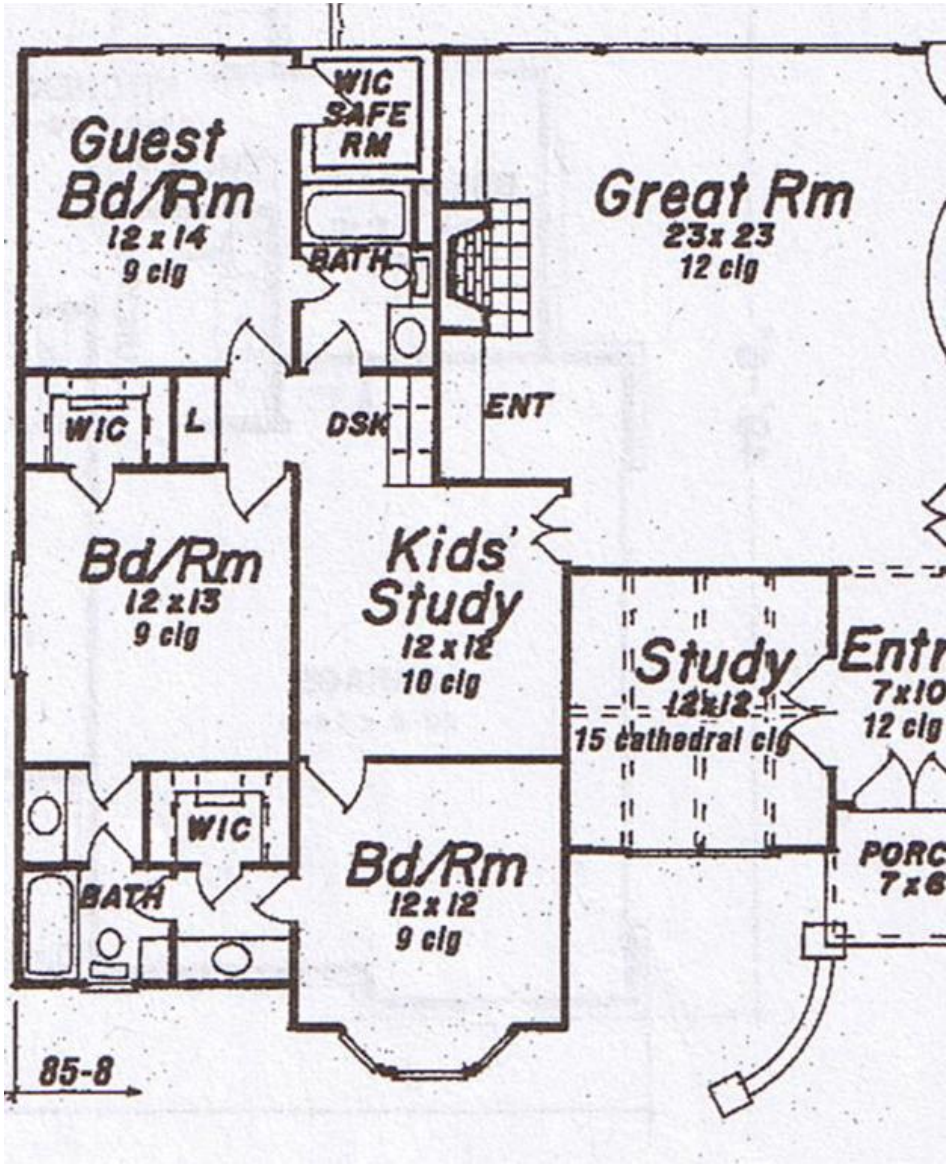
A small bedroom is 100 sq. ft.

An average size bedroom contains between 125 and 175 sq. ft.

A large bedroom has over 175 sq. ft.

For privacy, bedrooms will usually be located with access from a hallway.

***The minimum closet depth is typically 24 inches.**



A linen storage should be located near the bedrooms, with 2 feet wide by 18 inches deep being the minimum space needed.

Space Planning for Bathrooms

A minimum size bath is 5' x 8'
a large bath may be 10' x 10', 10' x 12', or larger

***A water closet is a toilet.**

***A lavatory is a sink.**

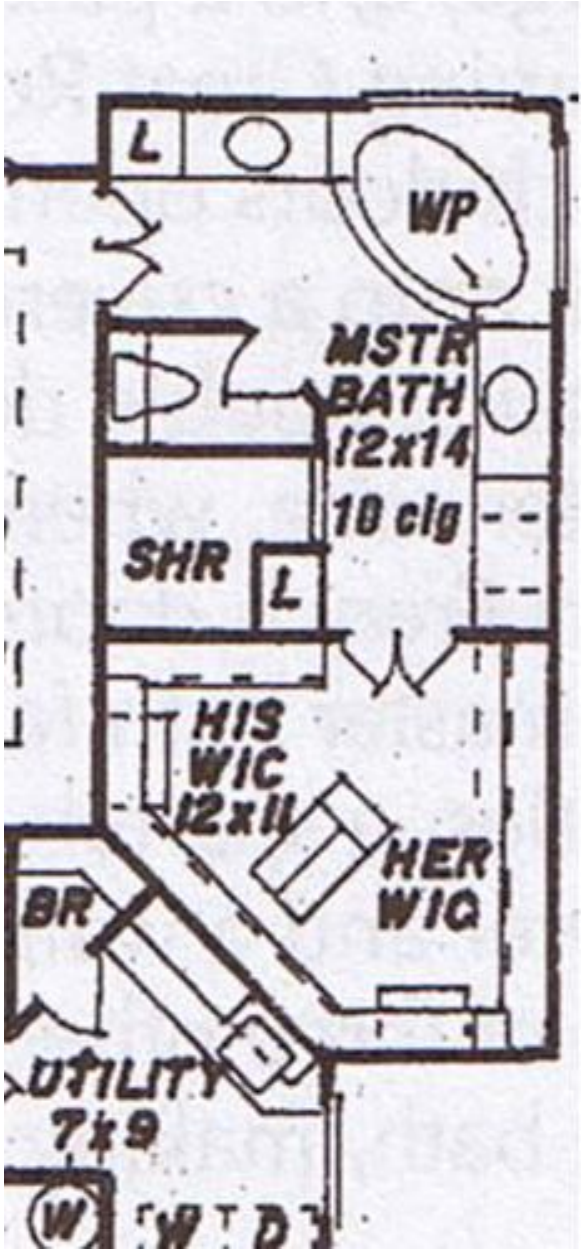
The minimum clearance in front of the water closet is 21”.

***The minimum water closet compartment width is 30” wide and 24” to 30” deep.**

The standard bathroom vanity is 22” deep and 32” high.

***The standard bathtub width is 30” to 32” and the length is 5'.**

Shower stalls – common shower sizes range from 30”x30” to 36”x48”



Space Planning for Bathrooms

If the bathroom's plumbing must be placed in a bedroom wall you should place closets on the wet wall and insulate the plumbing wall.

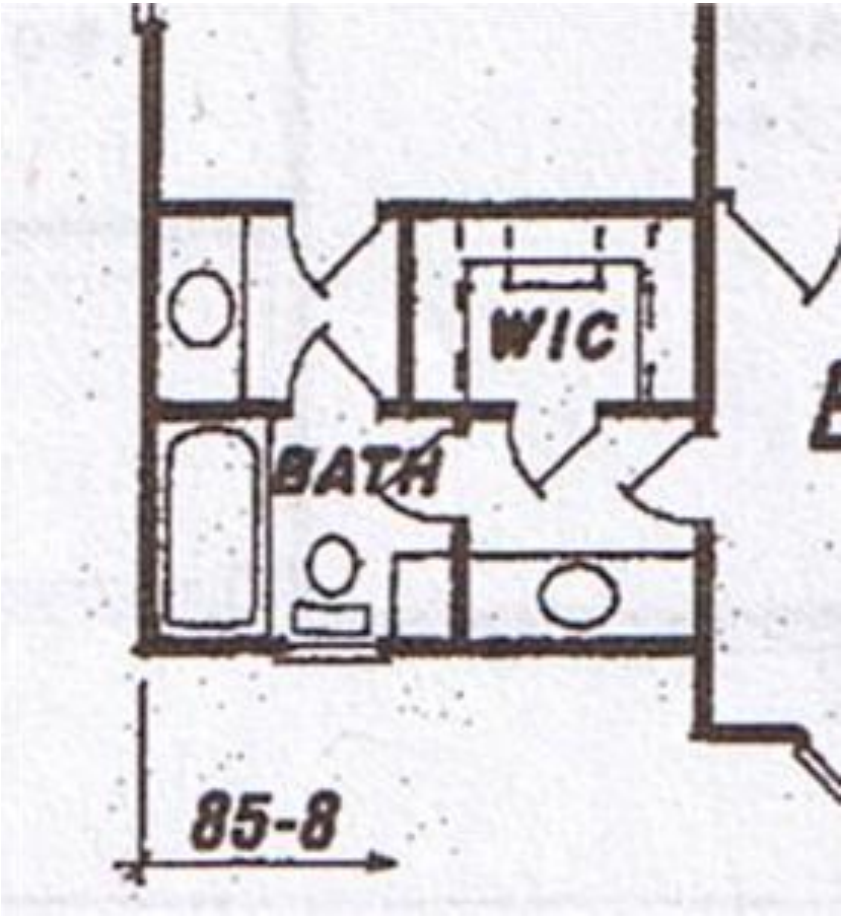
***A half bath contains a lavatory (sink) and a water closet (toilet).**

***A three-quarter bath has a lavatory (sink), water closet (water closet), and a shower.**

When a residence has two baths they will normally be placed back to back or above each other in order to reduce plumbing costs.

Combining a bathroom with a utility room creates what is called a mud room.

Bathrooms, kitchen, utility rooms and the garage are all classified as service areas. They should be designed so that noise generated by plumbing, appliances, and etc., do not interrupt activities of the living and sleeping areas.



Space Planning for Closets

The FHA (Federal Housing Administration) recommends:

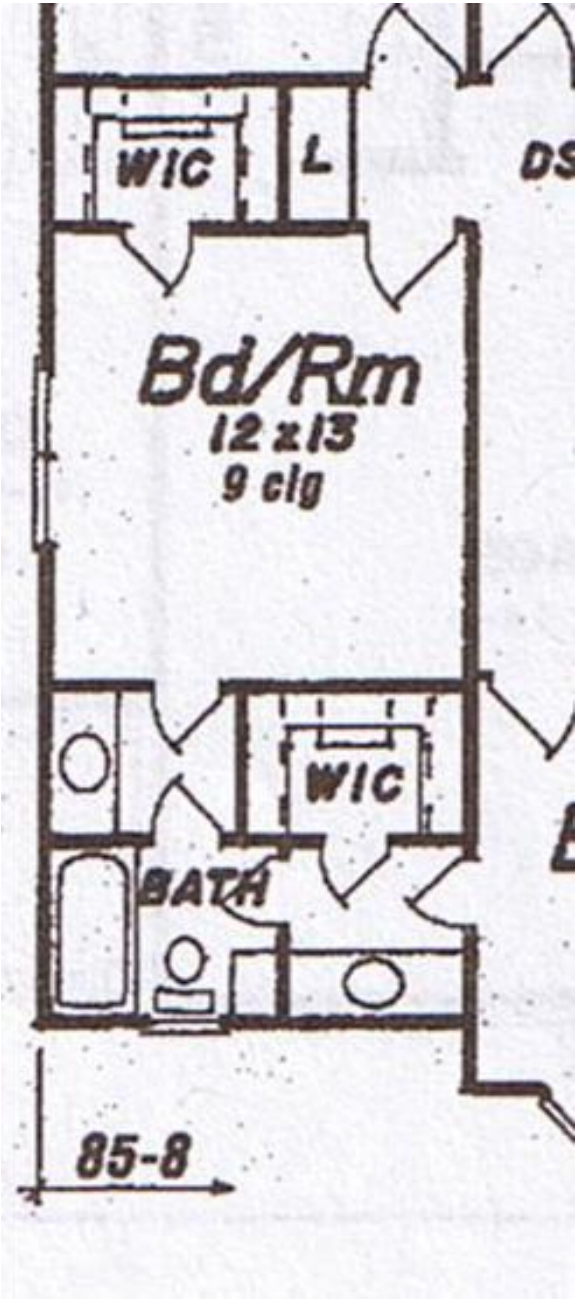
A minimum of four linear feet of closet rod space for a man

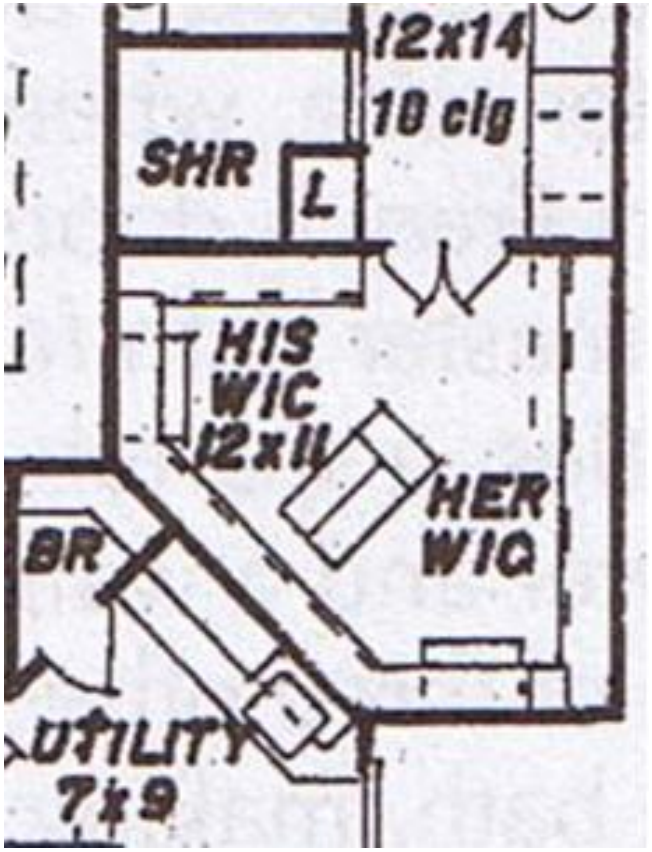
Six feet for a woman.

***The minimum depth of a clothes closet is two feet. If space is available, a 30" depth is desirable.**

When possible, closets should be located along interior walls rather than exterior walls. This provides noise insulation between rooms and does not reduce exterior wall space.

Closets should be located near the entrance of the room for easy access.





Space Planning for Laundry

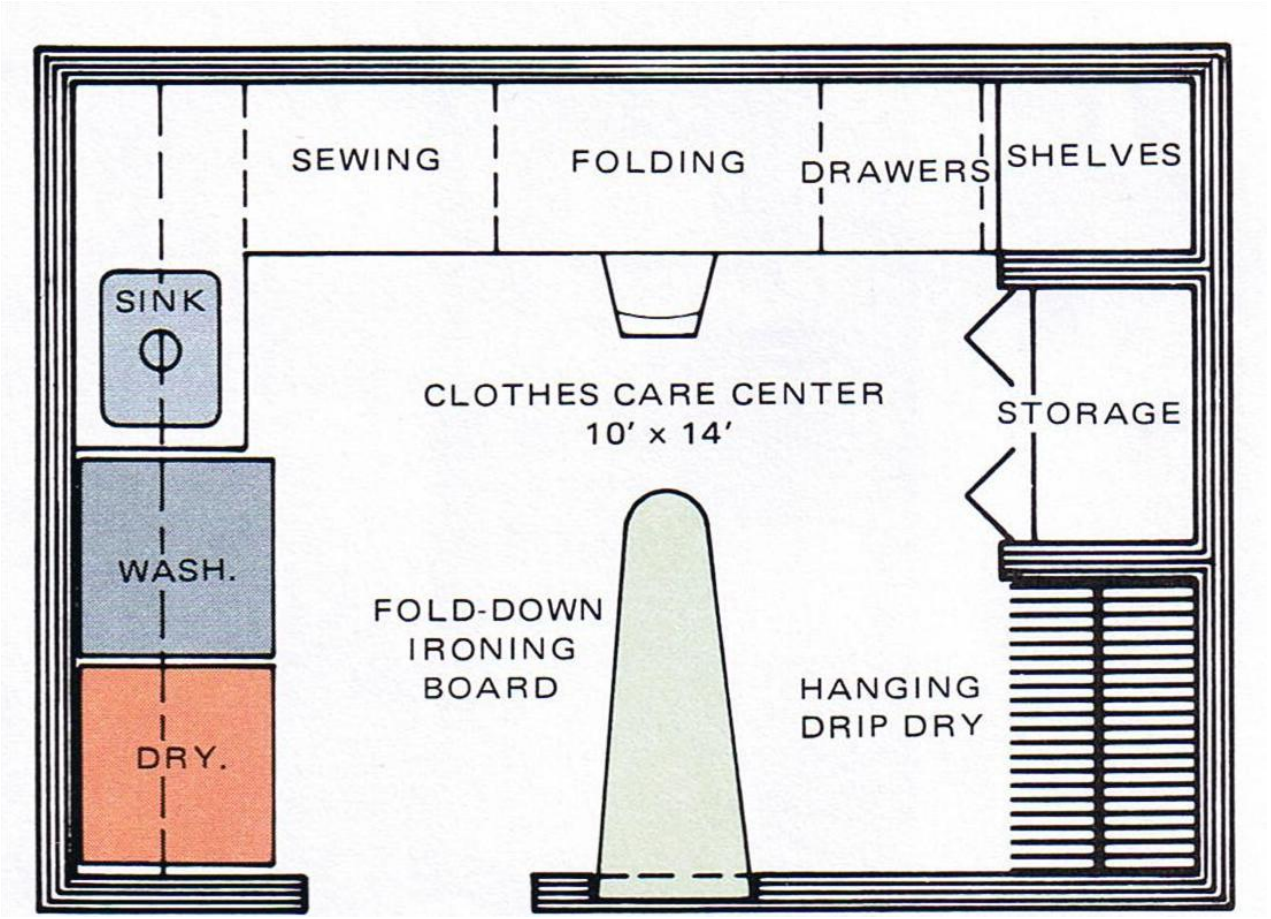
Laundry rooms should be ventilated and well lighted.

The floor must be resistant to water and easily cleaned.

Counter top space that is durable and soil resistant provides for a convenient work area.

Usually laundry rooms are located next to the Kitchen, however modern homes are locating them near the bedrooms especially if the bedrooms are on the 2nd floor.

***The size of washer and dryers are 29” in width and 26” in depth.**



6 Styles of Kitchens

*Straight Line Kitchen

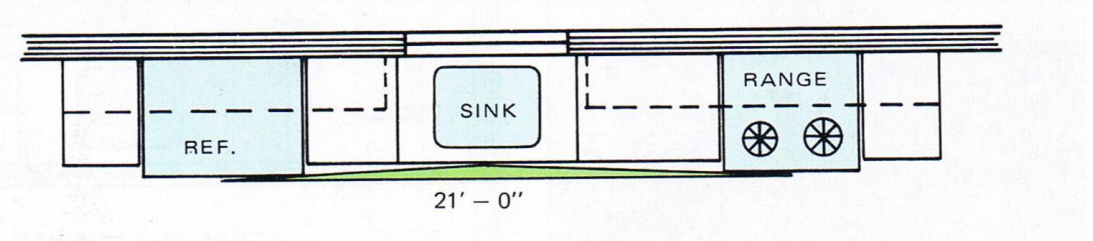
*L-shaped Kitchen

*Corridor Kitchen

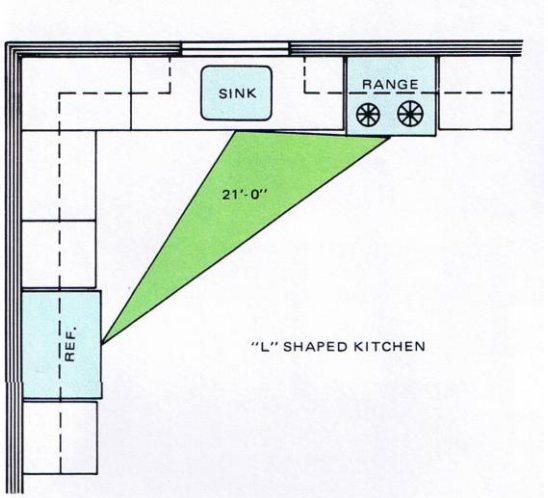
*U-shaped Kitchen

*Peninsula Kitchen

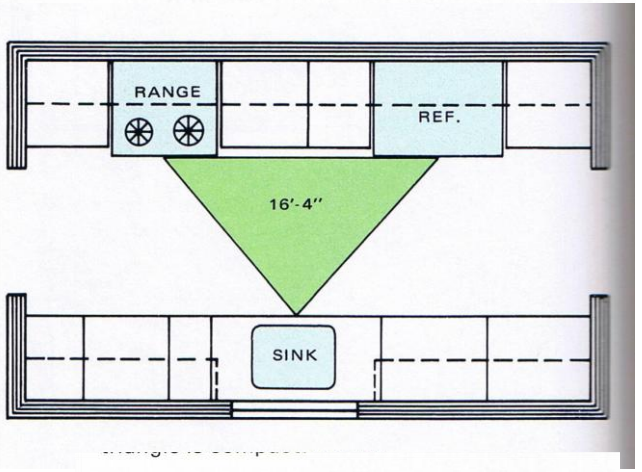
*Island Kitchen

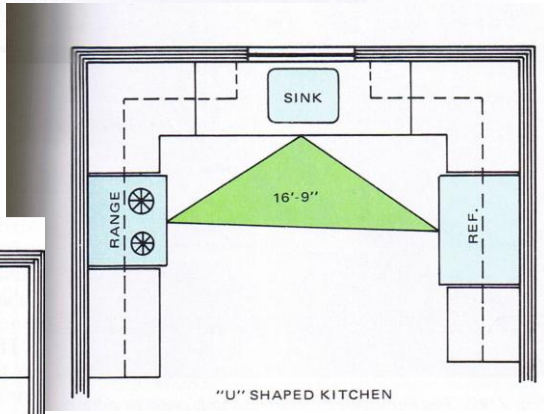


STRAIGHT LINE KITCHEN

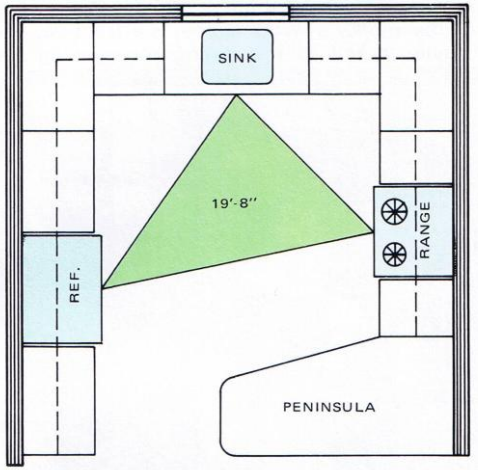


"L" SHAPED KITCHEN

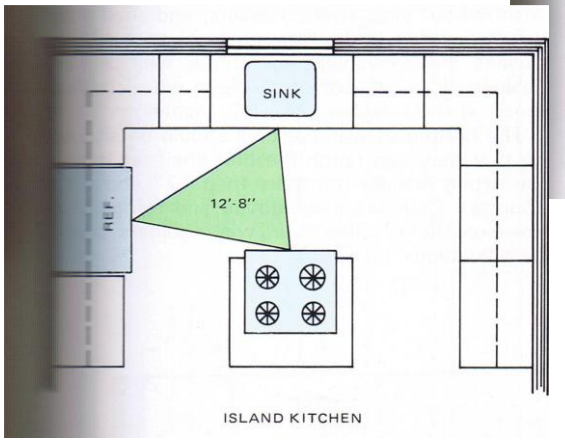




"U" SHAPED KITCHEN



PENINSULA KITCHEN



ISLAND KITCHEN

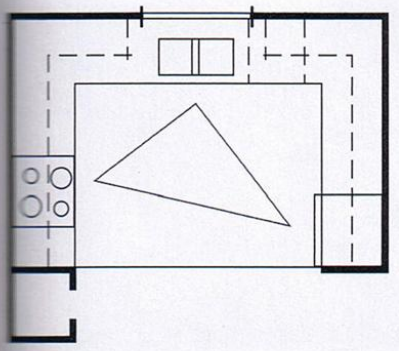
Space Planning for Kitchens

The work triangle is one measure of kitchen efficiency.

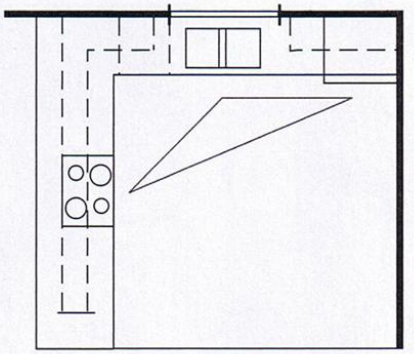
***It is determined by drawing a line from the front center of the range to the refrigerator to the sink and back to the range.**

The length of these three lines are added together to produce the length of the work triangle.

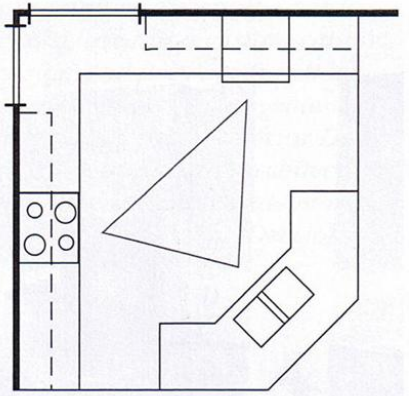
***For practical kitchen design this distance should be at least 15 feet but not to exceed 22 feet.**



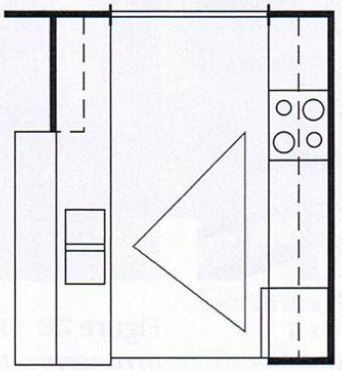
U-SHAPE KITCHEN
U-shape kitchens are generally considered the most comfortable and efficient. Work centers are out of the way of traffic and more conveniently located. Accommodates 1 person best.



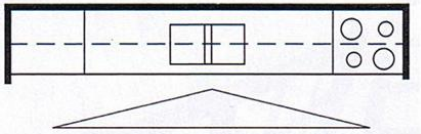
L-SHAPE KITCHEN
L-shape kitchens are a little more efficient than the parallel since traffic lanes do not intrude into the space. Work centers are conveniently located. Can accommodate 2 people.



ISLAND KITCHEN
The island kitchen has similar qualities as the U-shape, but with the unwelcome addition of possible traffic through the space. Can accommodate 2 people.



PARALLEL KITCHEN
Parallel kitchens provide undesirable traffic, especially when doors are located at each end. Work centers are more



ONE-WALL KITCHEN
One-wall kitchens economically use one plumbing wall, can be concealed with folding doors, and do not take up much space. They are usually most suitable for apartments and small living spaces. They have very little counterspace and workspace pattern is long. Best with 1 person.

Space Planning for Kitchens

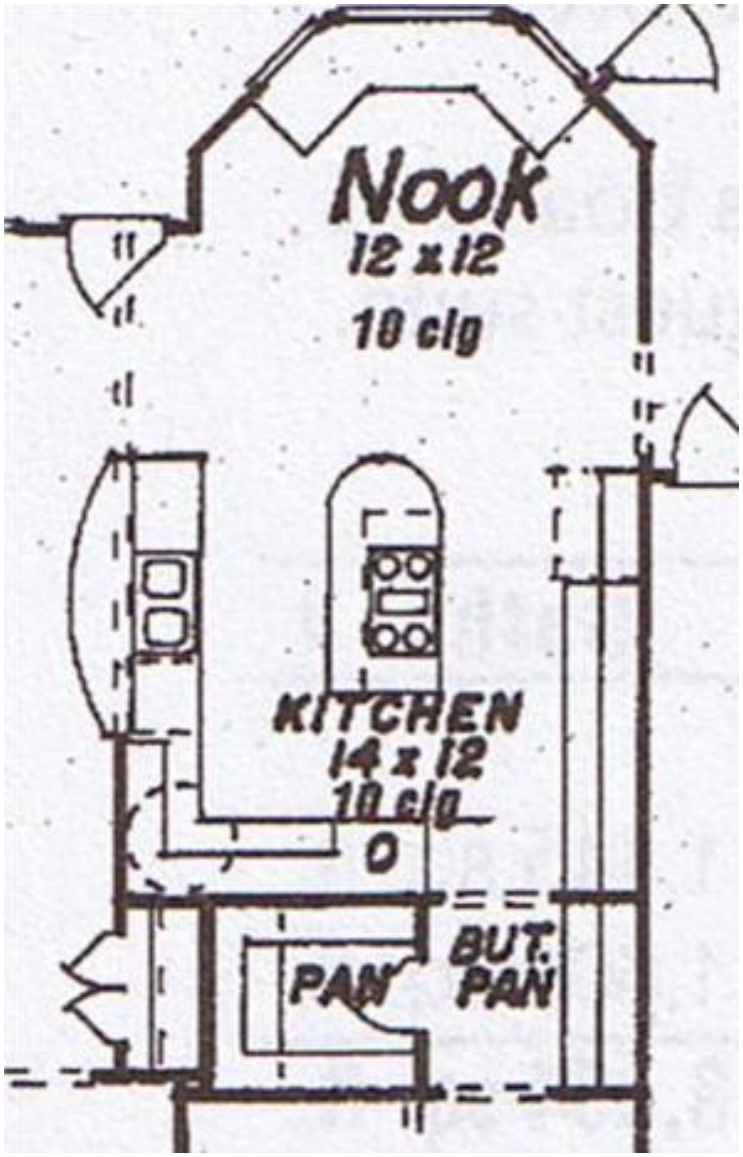
Clear counter workspace should be placed near sinks as well as near storage and cooking areas. At least one of the counters should provide a work space of 48 inches. Each other work space should have at least 18 inches of work space.

A stove should have at least 18 inches of counter space on each side of it for temporary storage while cooking and for safety reasons.

A typical double sink is 32”x21”. 36” should be provided on one side of the sink and between 24” to 30” on the other for the cleaning and storage of dishes.

The dishwasher should be placed near and on the same counter as the sink. *The size of a dishwasher is 24.75 inches deep by 24 inches wide.

Try to provide a minimum of 48” between counters to provide adequate room for someone to work at the sink or stove while someone is passing behind him or her.



***The lower Kitchen cabinet is 24” deep and 36” high.**

***The upper kitchen cabinet is 12” deep.**

Space Planning for Kitchens

The refrigerator is usually placed at the end of a counter within five or six feet of the sink and the cooking center. If it must be placed near the inside corner of the cabinet allow a minimum of 15 inches in the counter to allow for access to the back of the counter. A refrigerator should have a counter space beside it with a width of at least 18".

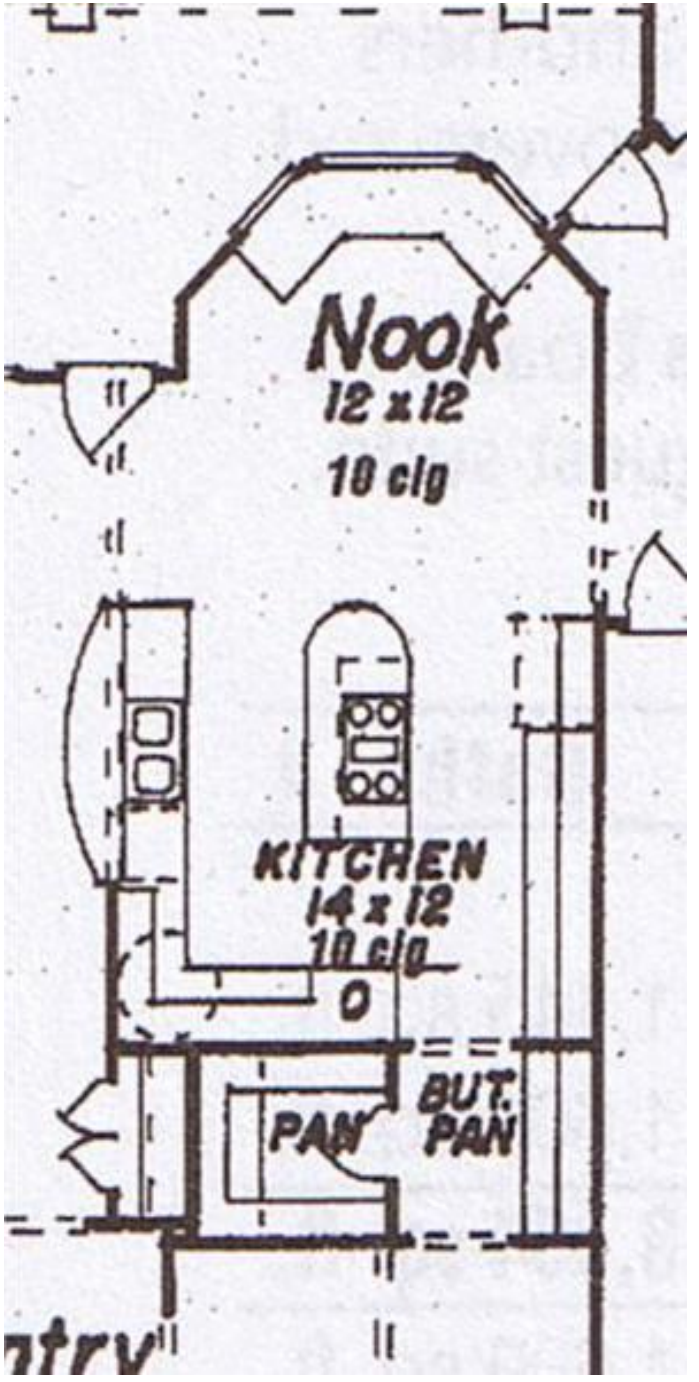
Because the stove generates heat it should not be placed directly next to the refrigerator, the trash compactor, or the storage for produce and breads.

Ideally, a minimum of 15" of counter space should be placed between each appliance.

The kitchen should NOT be placed in a central location so that all household traffic will pass through the work triangle.

There are two reasons for placing the kitchen sink under a window: 1) Good source of light 2) Supervision of outside activities.

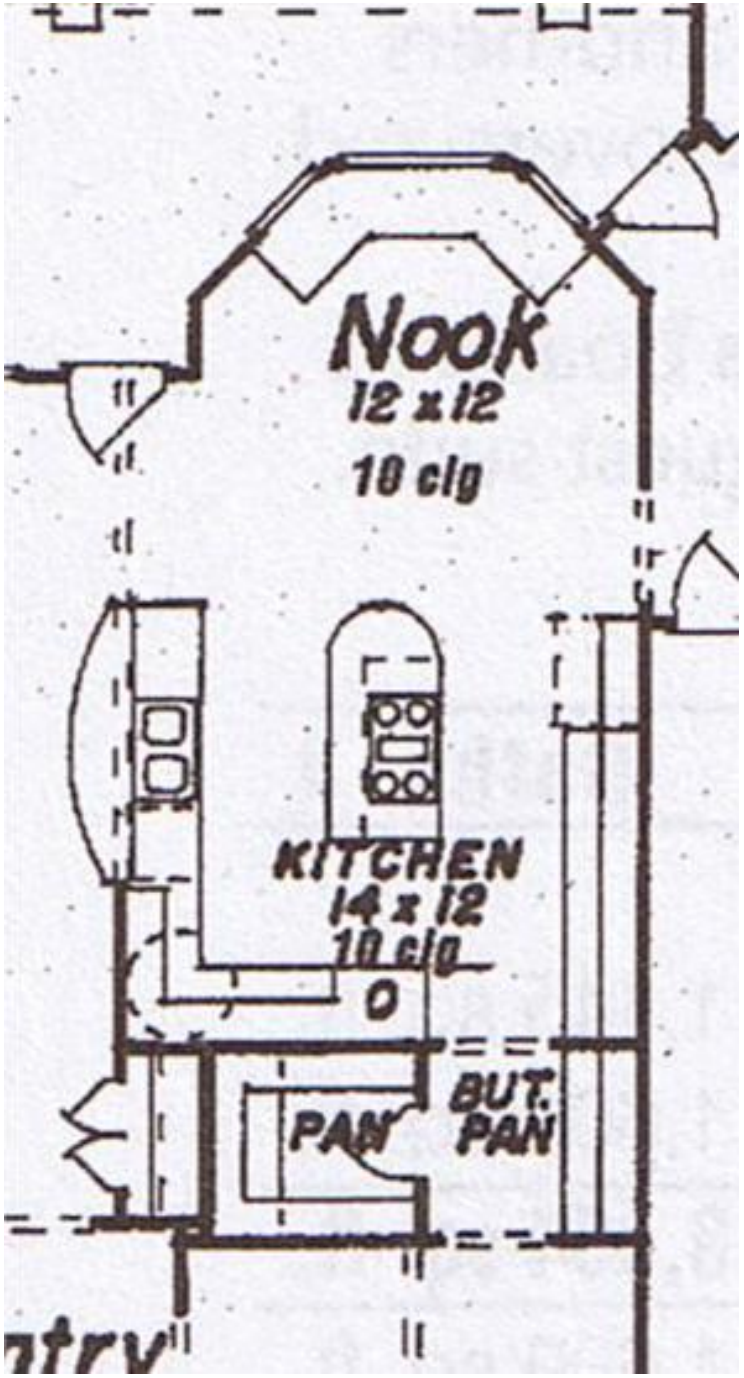
***When installing an island in the kitchen keep a minimum of 42" between it and other counters to allow for traffic. If the island contains an appliance such as a stove 48" should be the minimum distance provided between counters.**



Space Planning for Kitchens

Lets take a look at the kitchen of the house we have been looking at.

Does it have a good working triangle?



Space Planning for Garages

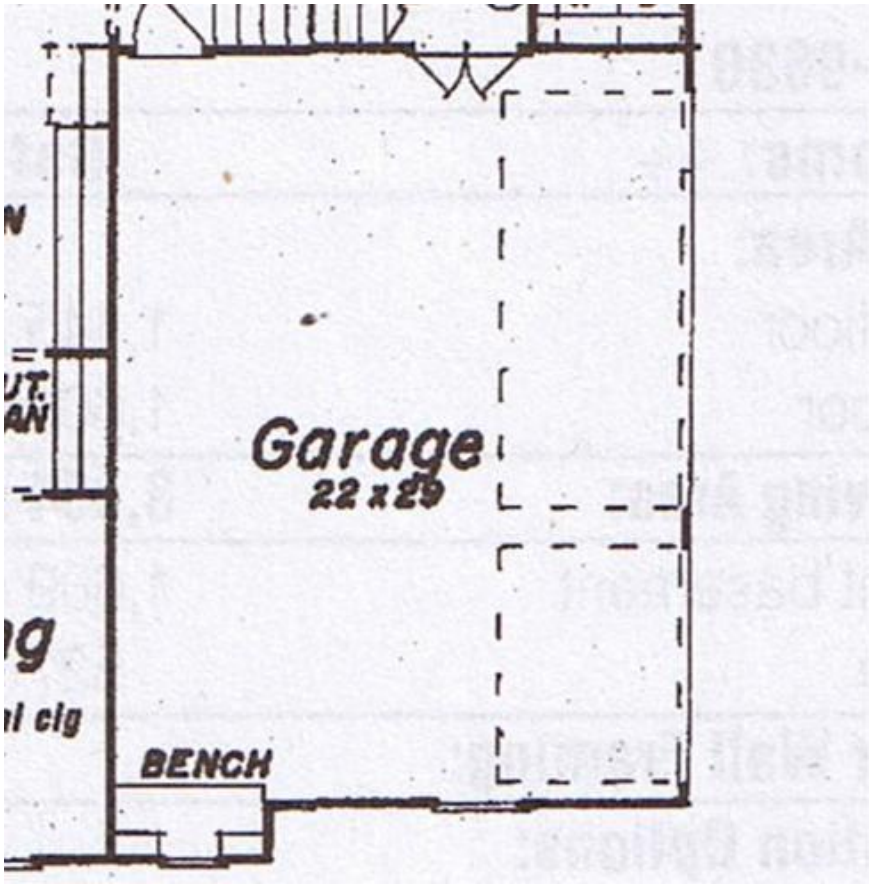
***A double car garage should be a minimum of 20' wide and 20' deep. Additional room should be provided for a workbench. An even more convenient size would be 22' wide by 24' deep.**

The floor of the garage should be at least 4" thick concrete reinforced with steel or wire mesh. Good floor drainage is important.

When using a separate garage door for each of the two parking spaces in a 2 car garage, a common door width to allow room for side mirrors in a truck would be 9'.

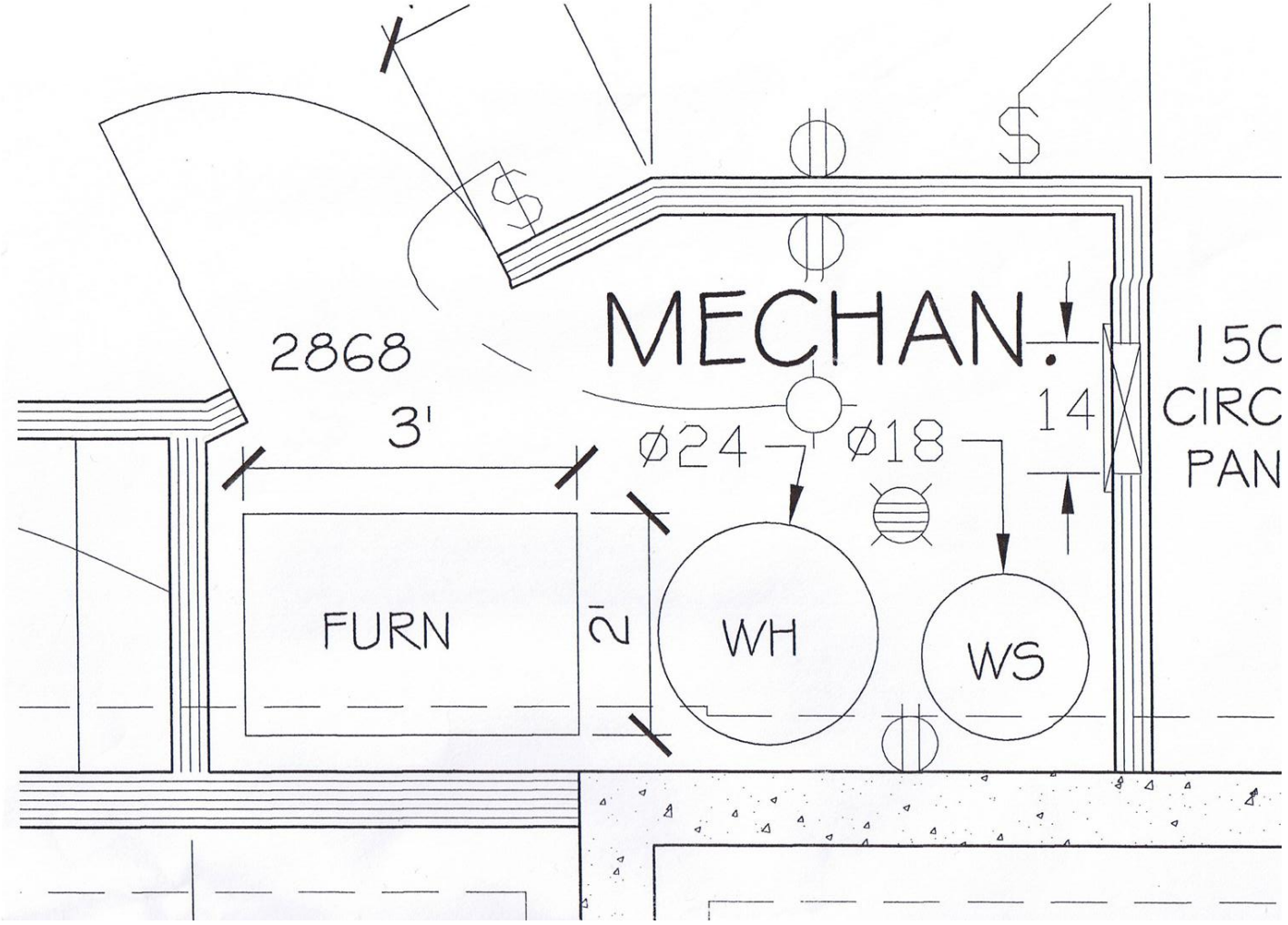
***When using a single garage door to close off two parking spaces in a garage the common size is 16' wide. *The height of the doors will usually vary between 7 and 8 feet depending upon the size of the vehicle.**

A level parking site should be provided with a minimum width of 9 feet per parking space with a minimum walk way between cars of 42 inches.

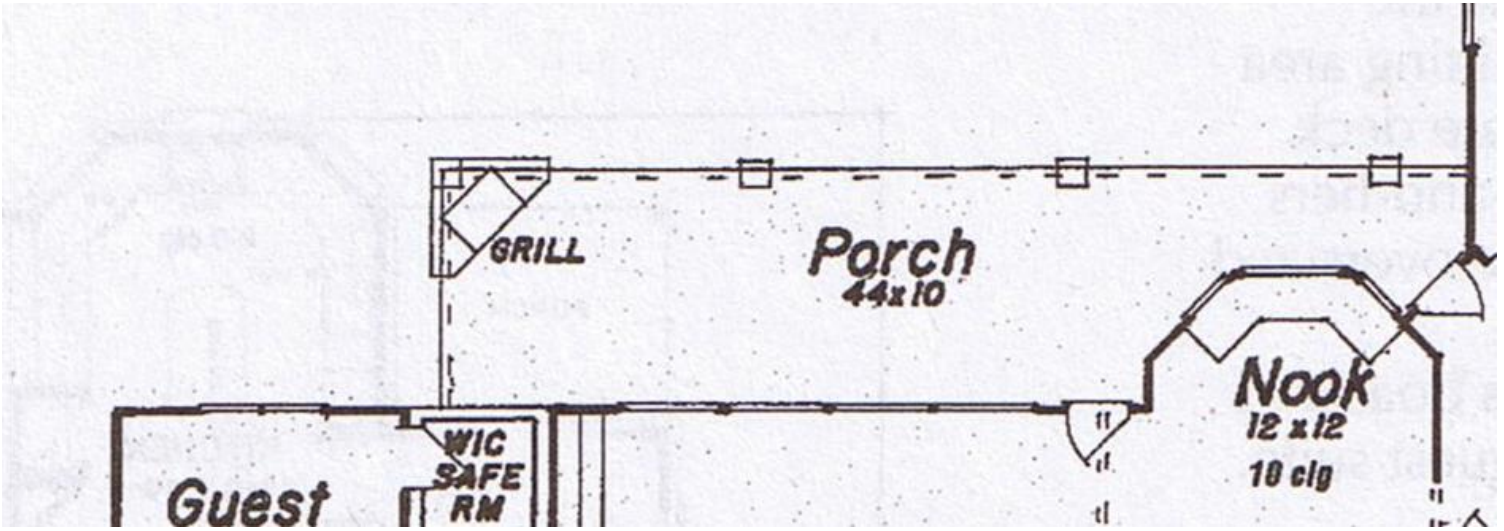


Space Planning for Mechanical Room

The Mechanical Room houses the furnace, water heater, water softener, and the breaker panel. This room also has a drain usually located near the water heater. There is a drain so if the water heater started leaking the water would drain out of the room preventing water damage to the floor.



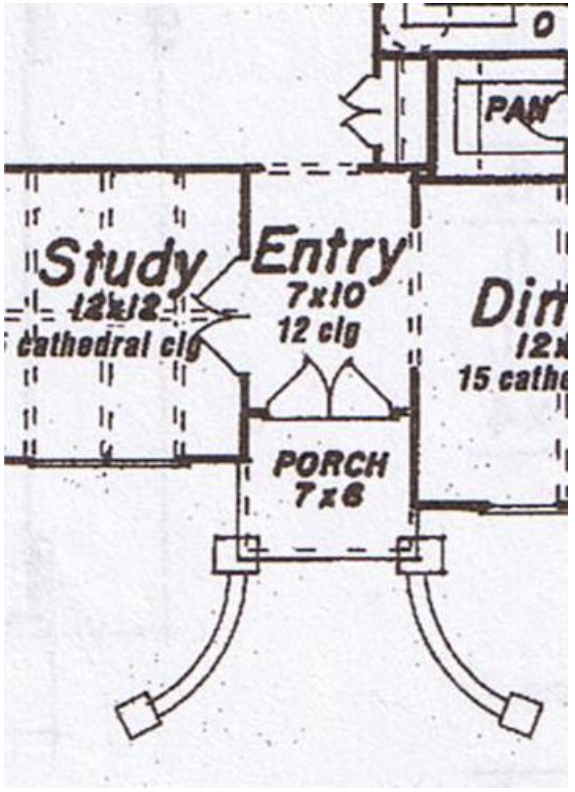
Space Planning for Patios, porches, and courts



A 10' x 14' patio is considered small, while a 20 x 30' is considered large.

Porches and decks differ from patios in a least two ways. First, they are generally structurally level. Secondly, porches are usually covered. Porches that are not under roof are usually called decks.

A court or courtyard is an exterior space that is at grade level, is enclosed on three or more sides by walls or a building, and is open and unobstructed to the sky.



Space Planning for Wheelchair Access

When designing in accordance with ADA 1997, ICC/ANSI A117.1-1998 a wheelchair ramp should have a nonskid surface. Ramps longer than 30 feet or higher than 30 inches should have a 48" wide landing at midpoint. Provide ramp handrails that are between 29 and 32 inches high.

When designing for wheelchair accessibility the interior doors should be designed with a 32 inch clear opening.

Hallways with a width of 42 inches will provide convenient traffic flow but 48 inches will make turning from hallways to doorways easier.

Window sills should be with in 24 inches of the floor and should not require more than 8 pounds of pressure to open.

Counter tops should be between 30 and 32 inches hight and oven controls should be on a front panel.

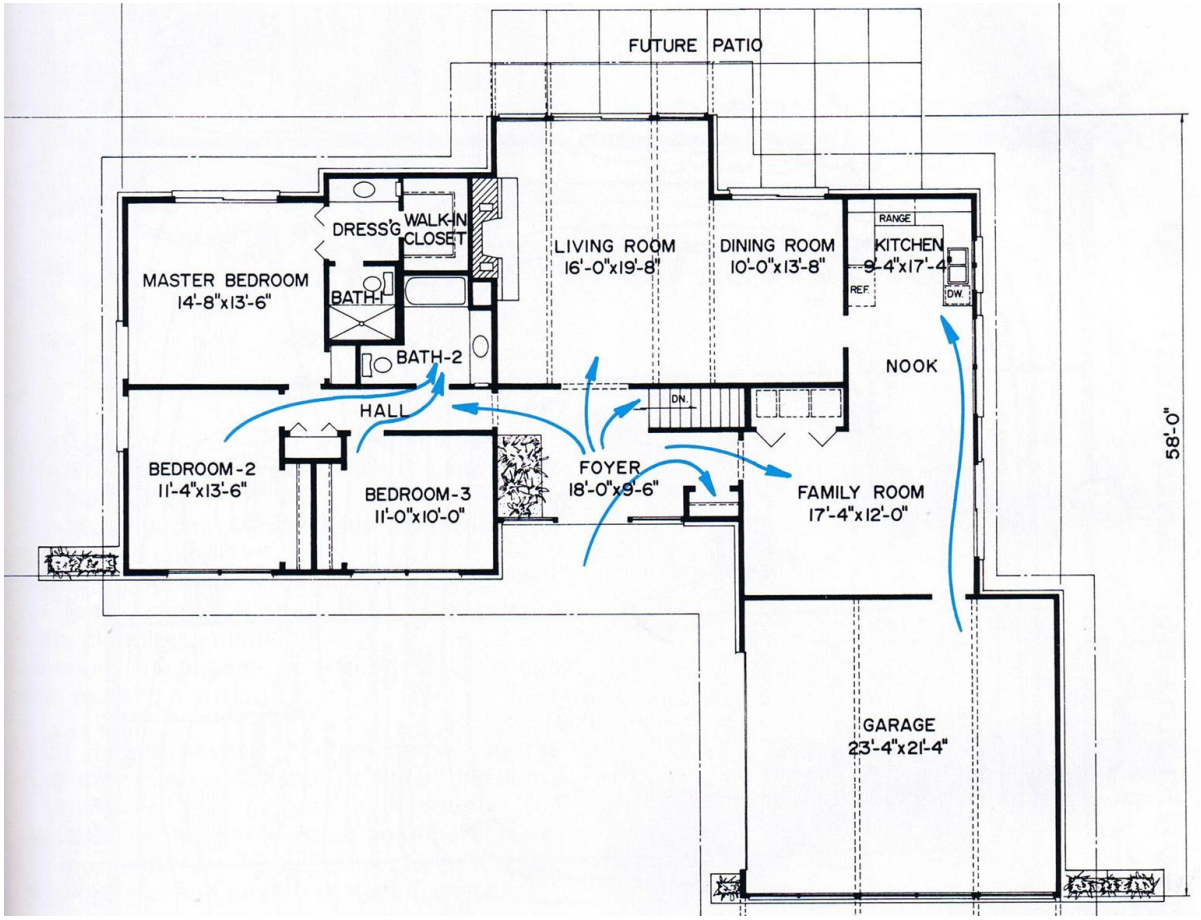
For wheelchair accessibility, vanities should have a roll-under counter top with a lowered or tilted mirror and roll-in shower with no curb should be provided.

Traffic Circulation

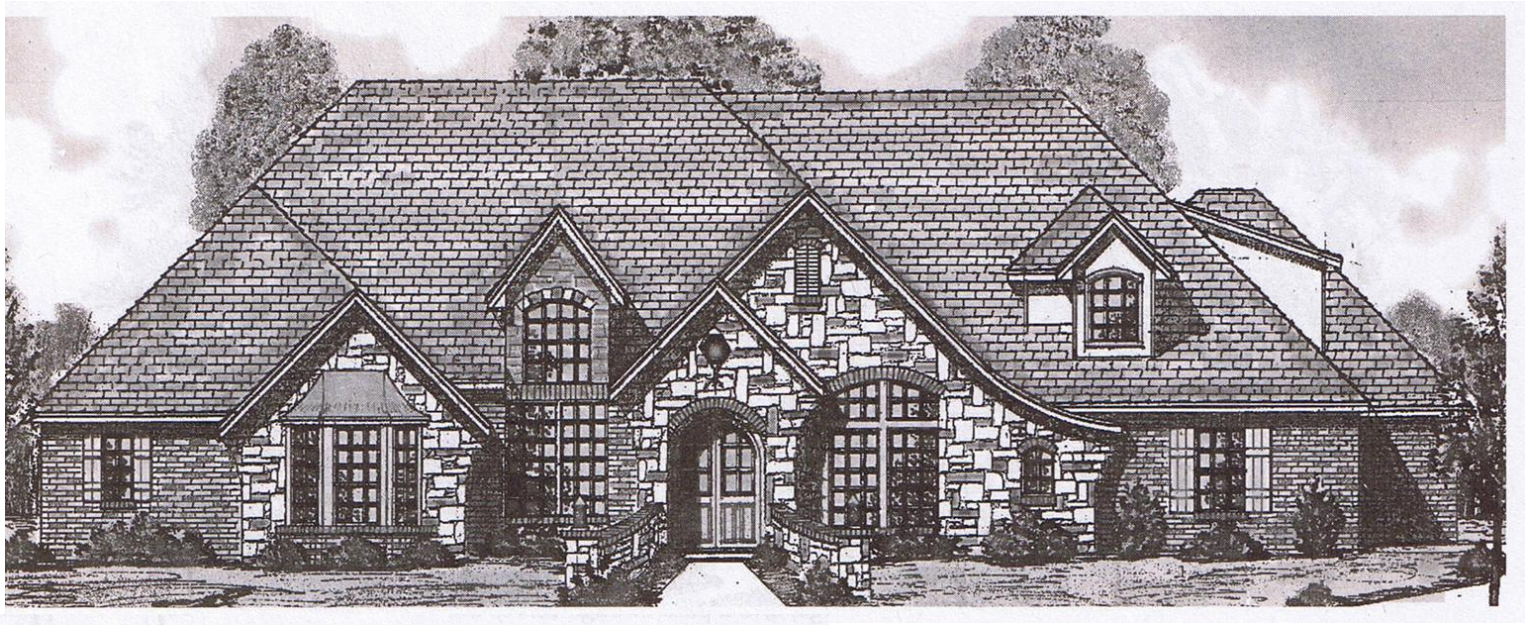
Traffic circulation involves those areas of the house that provide a means of moving from one area or room to another.

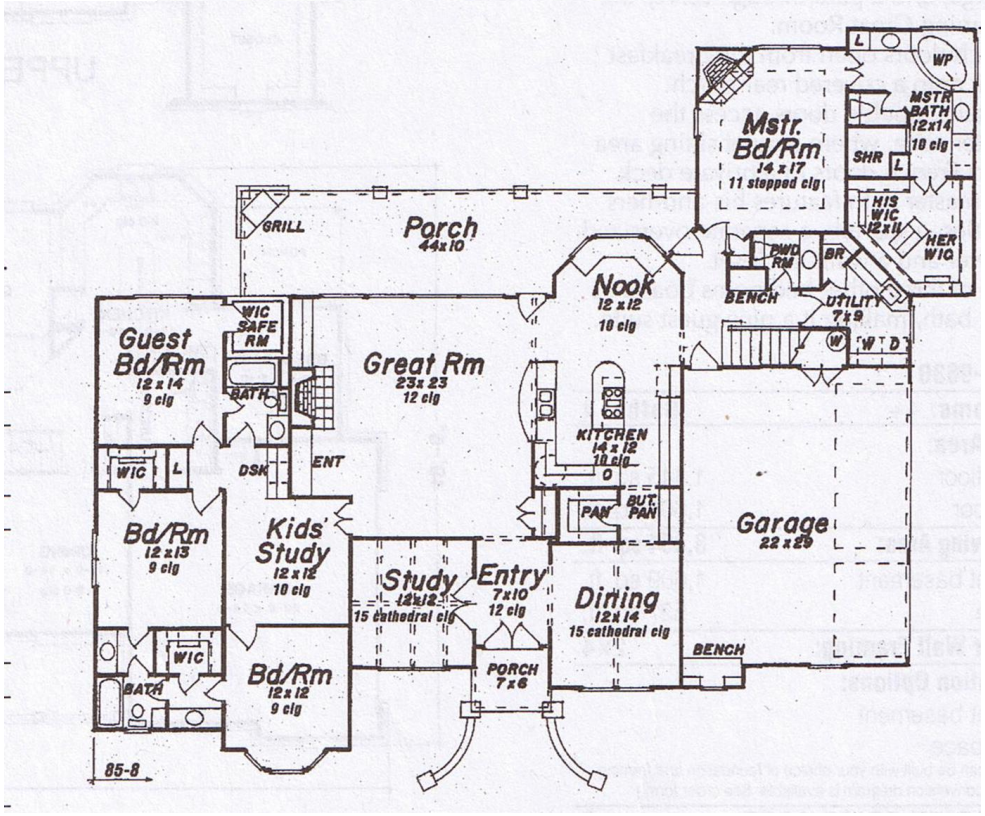
***Considerations for traffic circulation:**

1. **The distance from the garage to the kitchen is short and direct.**
2. **The Foyer is centrally located and convenient to all parts of the house.**
3. **All bedrooms are close to a bath.**
4. **Few rooms have traffic planned through them. The family room and eating nook are exceptions.**



Space Planning





Looking at this house plan, does it have a nice flow and appropriate sizes of rooms?

Space Planning

With everything we have been learning, let us take a look at this layout to see if it is well designed.