# Residential Construction Mastery<sup>™</sup>



# **Course Worksheets**

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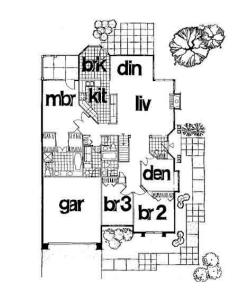


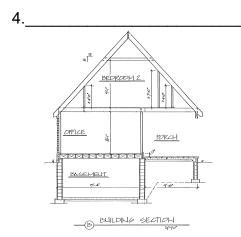
# **Architectural Drawing Process**

## Steps in the drawing process:

1.\_\_\_\_

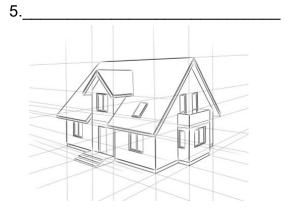
# **Orthographic Projection**





2.









#### **Architectural Scale Rulers**

1.\_\_\_\_\_

2.

#### **Examples of Scales**

1/8" scale means \_\_\_\_\_

1/4" scale means \_\_\_\_\_

30' scale means \_\_\_\_\_

50' scale means \_\_\_\_\_

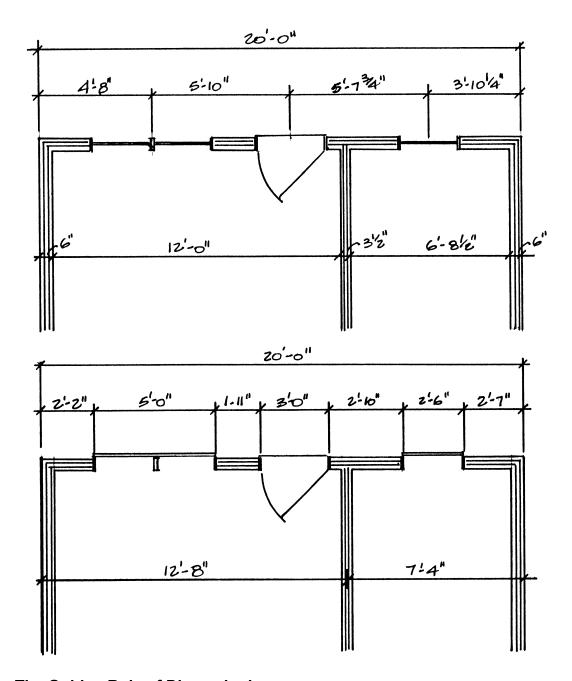
If you do not have access to an architectural scale ruler, please print an additional copy of this page and cut out the ruler image to work along with the "Dimensions and Scales" segment of the course.

Please note: Due to variations when printing, the dimensions on this

image may not be exact.



# **Using an Architectural Scale Ruler**

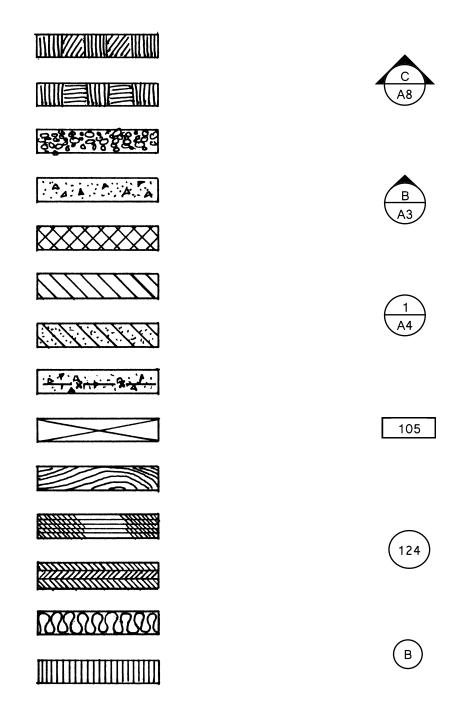


# The Golden Rule of Dimensioning:

	takes precedence over	·
Unit Dimenson:		
Rough Opening:		



# **Material and Plan Symbols**





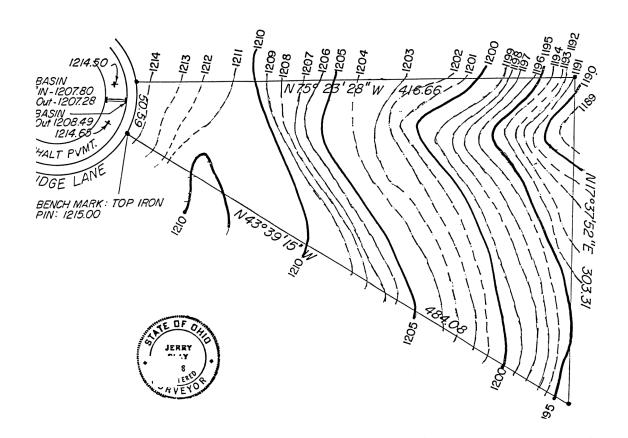
# Site Design & Evaluation

# The building site impacts the home in three areas:

1	 	 	_
2	 		_
3.			

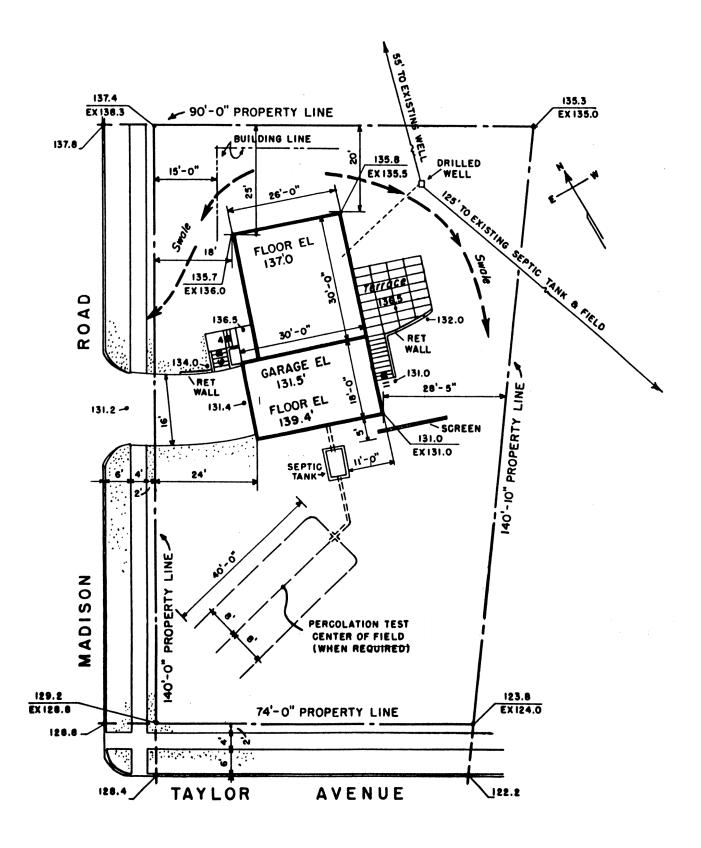
# Typical home site design drawings:

1	 	 
2		
3.		
4		





# **Site Development Plan**



Residential Construction CERTIFIED SITE EVALUA	ATION CHECKLIST
Site Owner	SizePhonePhone
Accessory Buildings Amenities Architectural Review Assessments Building Design Character Clearing Community Features Convenience Deed Restrictions Drainage Driveway Easements Electric Service Flood Plain Gas Service Grading Requirements	Impact Fees   Liens   Neighboring Properties   Prestige   Privacy   Security   Setbacks   Septic System   Sewers   Soil Conditions   Trees   Views   Water Service   Well   Wetlands   Zoning Restrictions



# **Dynamics of Scheduling**

Construction scheduling is a dynamic process impacted by:

1.	
o. -	 





# RESIDENTIAL CONSTRUCTION SCHEDULING FLOW CHART

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# **Construction Scheduling Worksheet**

The following list includes major activities necessary for scheduling the construction of a new home. These activities are in mixed order... can you number them according to their normal sequence during construction? Give it a try!

SEWER LINES	BACKFILL
CLEAN UP	CONCRETE FLOOR
FINISH SPECIAL MECHANICALS	MIRRORS
FRAMING	BATH ACCESSORIES
FINAL GRADING	WATER SERVICE / WELL
CABINETS / TOPS	CHIMNEYS/FIREPLACE
ROUGH PLUMBING	FINISH PLUMBING
HARD SURFACE FLOOR	ROOFING
CARPETING	PHONE SERVICE
EXCAVATION	EXTERIOR FINISH
GUTTERS/DOWNSPOUTS	LANDSCAPING
ELECTRIC SERVICE	SPECIAL MECHANICALS
SURVEY / STAKEOUT	ROUGH HEATING
LIGHT FIXTURES	FINAL CLEAN-UP
APPLIANCES	FINISH CARPENTRY
FOUNDATION	GAS SERVICE
PAINTING	INSULATION
LOCKSETS / HARDWARE	ROUGH ELECTRICAL
WALKS/DRIVEWAY	DRYWALL
CLEARING	WINDOWS/DOORS
FINISH ELECTRICAL	SEPTIC
UNDERGROUND PLUMBING	FINISH HEATING

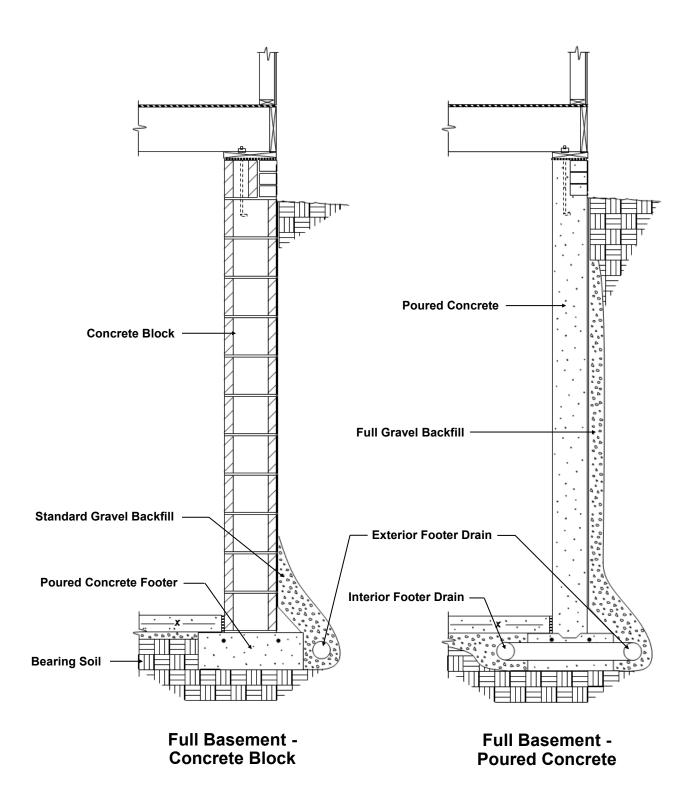




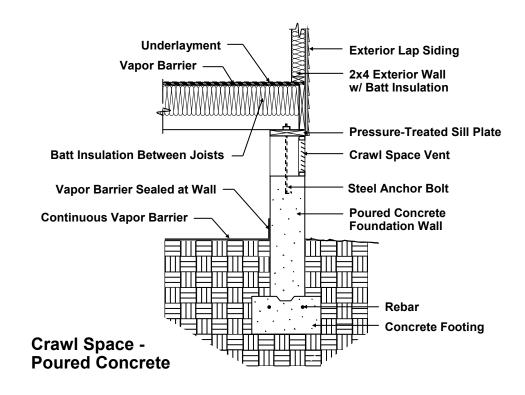
# Foundations, Materials, and Considerations

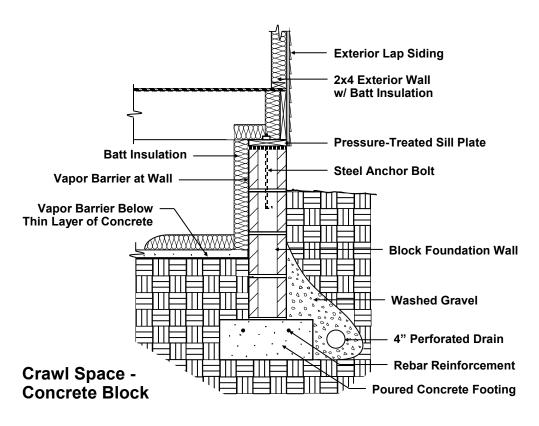
Types of residential foundations:	
1	
2	
3	
4	
Foundation materials:	
1	
2	
3	
4	
Primary foundation considerations:	
1	
2	
2	



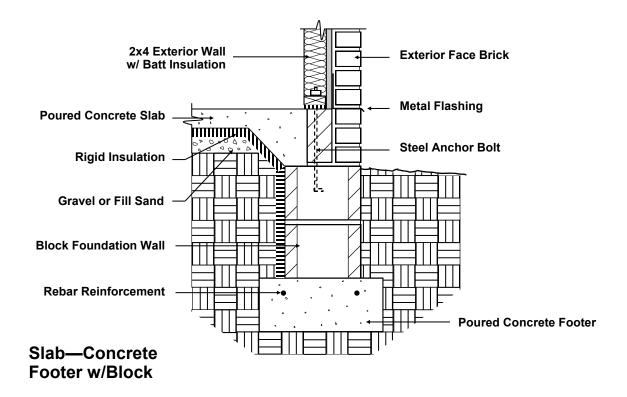


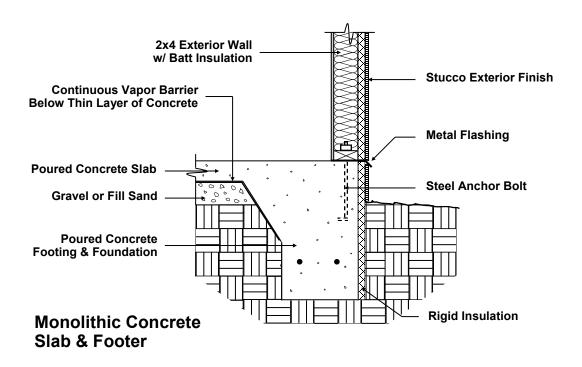




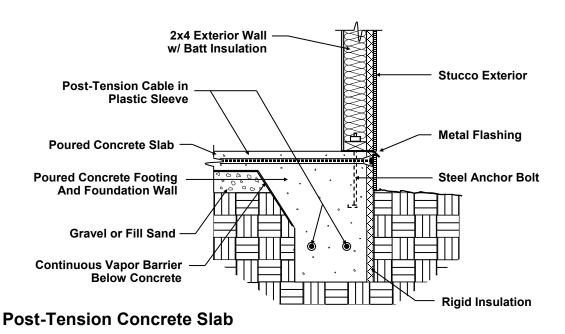


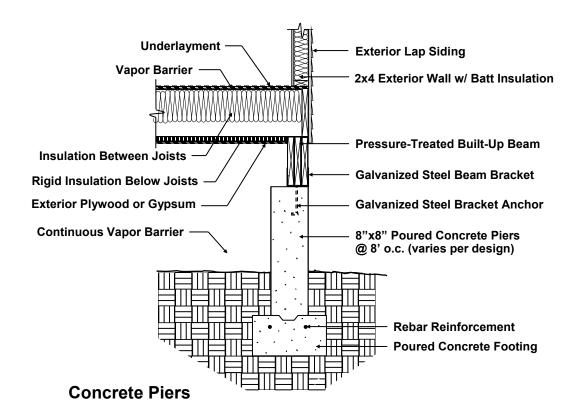




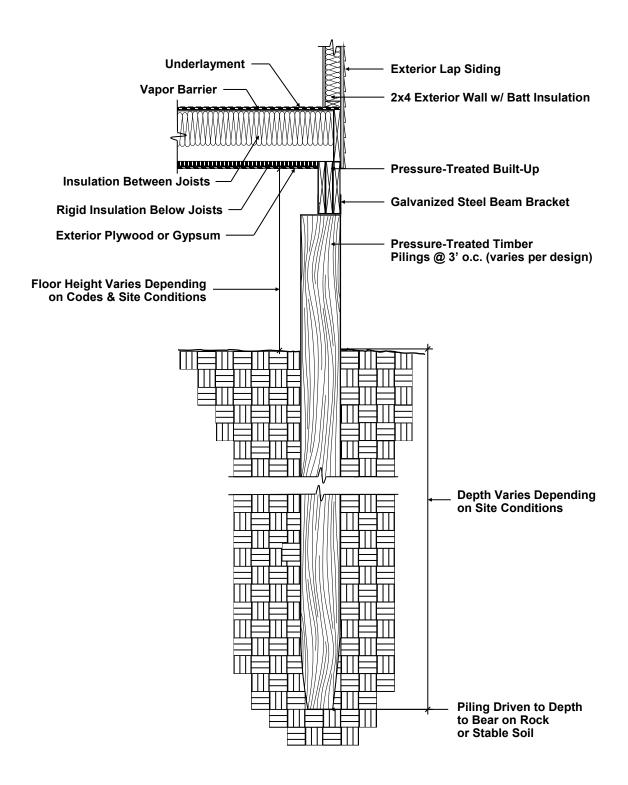






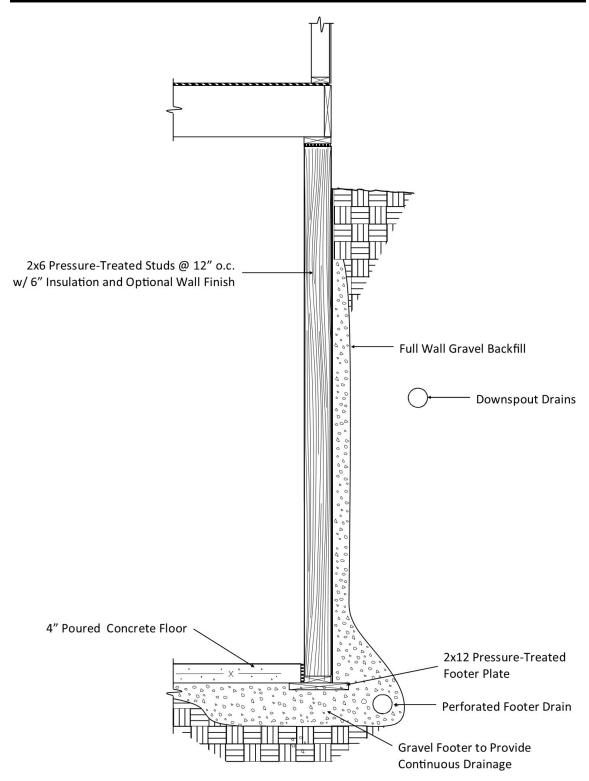






**Pressure-Treated Wood Pilings** 



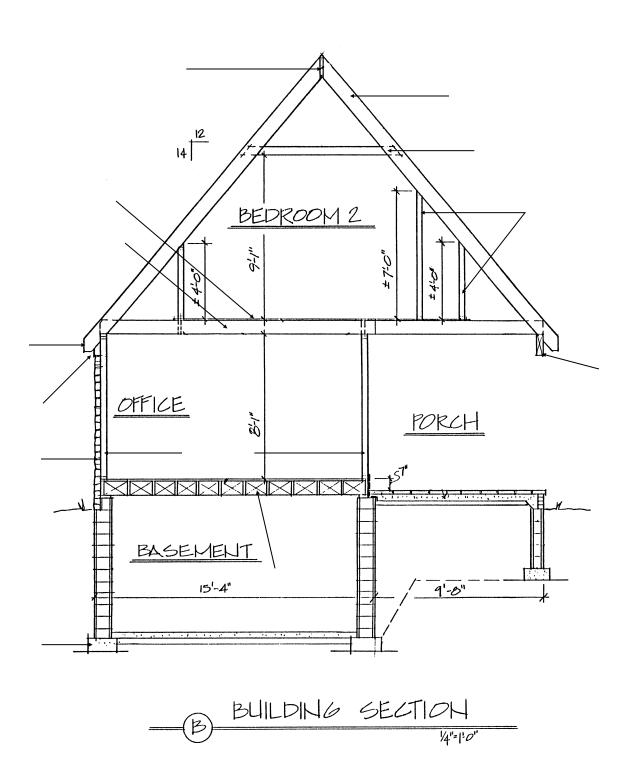


**Permanent Wood Foundation** 

# **Permanent Wood Foundation**



# **Structure & Terminology**





# **Dimensional Lumber & Structural Loads**

Nominal Dimensions	Actual Dimensions
1 x 2	3/4" x 1-1/2"
1 x 3	3/4" x 2-1/2"
1 x 4	3/4" x 3-1/2"
1 x 5	3/4" x 4-1/2"
1 x 6	3/4" x 5-1/2"
1 x 7	3/4" x 6-1/4"
1 x 8	3/4" x 7-1/4"
1 x 10	3/4" x 9-1/4"
1 x 12	3/4" x 11-1/4"
5/4 x 4	1" x 3-1/2"
5/4 x 6	1" x 5-1/2"
5/4 x 8	1" x 7-1/4"
5/4 x 10	1" x 9-1/4"
5/4 x 12	1" x 11-1/4"
2 x 4	1-1/2" x 3-1/2"
2 x 6	1-1/2" x 5-1/2"
2 x 8	1-1/2" x 7-1/4"
2 x 10	1-1/2" x 9-1/4"
2 x 12	1-1/2" x 11-1/4"
4 x 4	3-1/2" x 3-1/2"
4 x 6	3-1/2" x 5-1/2"
6 x 6	5-1/2" x 5-1/2"
8 x 8	7-1/4" x 7-1/4"

Dead Loads:			 
Live Loads:_			 
Joists and ra	fters are designe	d to limit	



# **Panel Materials**

Wood structural panels:					
1					 
2					 
3					 
Addi	tional	pane	l mate	erials:	
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2		· · · · · · · · · · · · · · · · · · ·			 
3					 
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5					 
6					

# Framing Systems & Alternative Structural Components

Framing systems:		
1		
7		
Alt	ernative structural components:	
1		
2		
3		



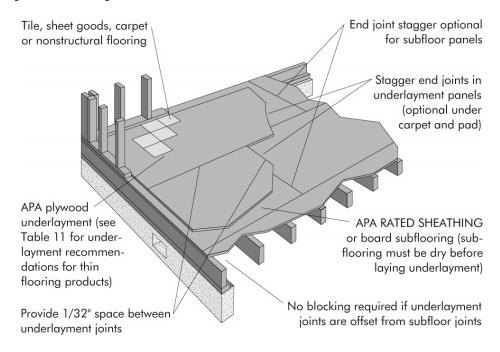
# Earthquake & Wind Resistance

Earth	equake and wind resistance details
1	
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Earth	nquake specific details
1	
2	
3	
High	wind resistance details
1	

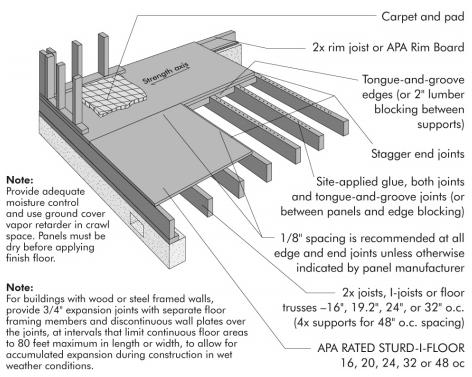
# Nome. Acope

# **Floor Construction**

### **Double Layer Floor System**



# **Single Layer Floor System**

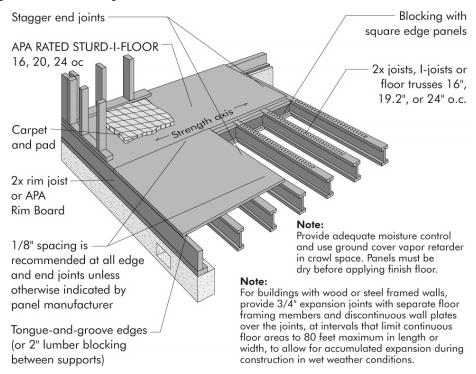


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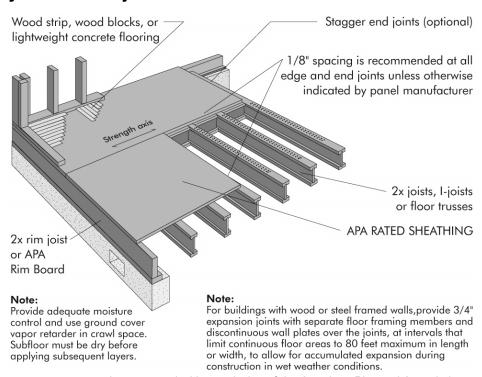
# Thome. Acade

# **Floor Construction**

# Single Layer Wooden I-joist Construction



# **Double Layer Wooden I-joist Construction**

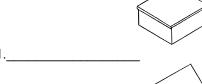


Images used with permission of the American Plywood Association

# **Roof Construction**



# **Roof Types**



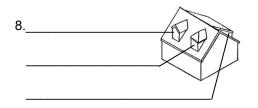








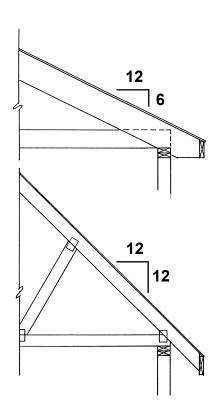




# **Roof Pitches**

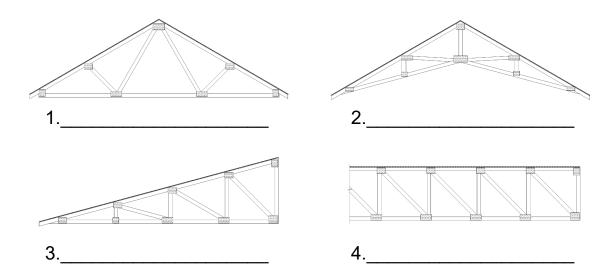
Roof pitches are described as a ratio between

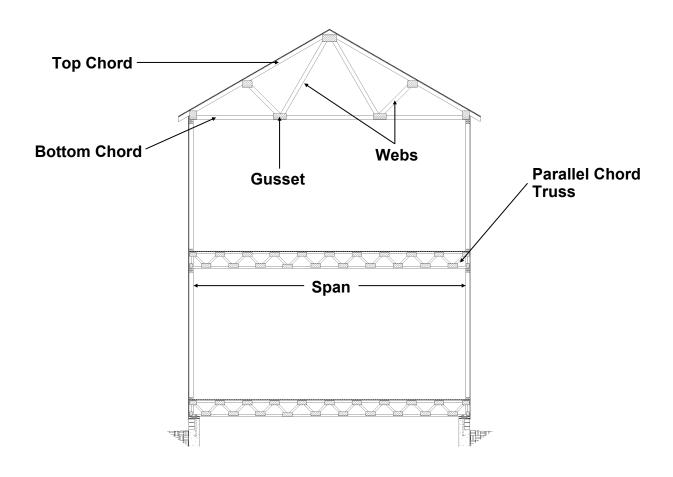
&





# **Roof Construction**

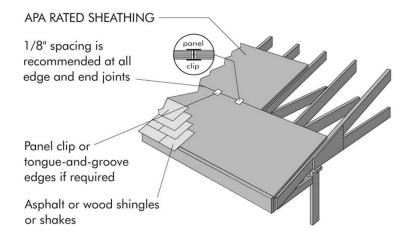


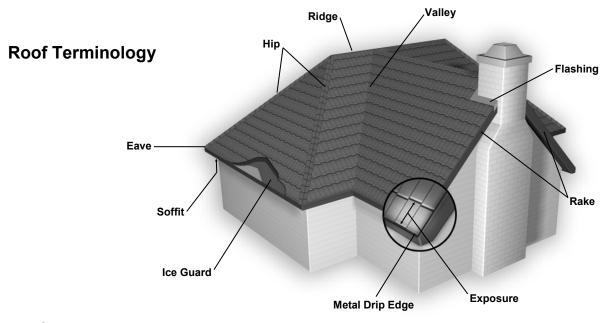




# **Roof Construction**

# **Roof Sheathing**



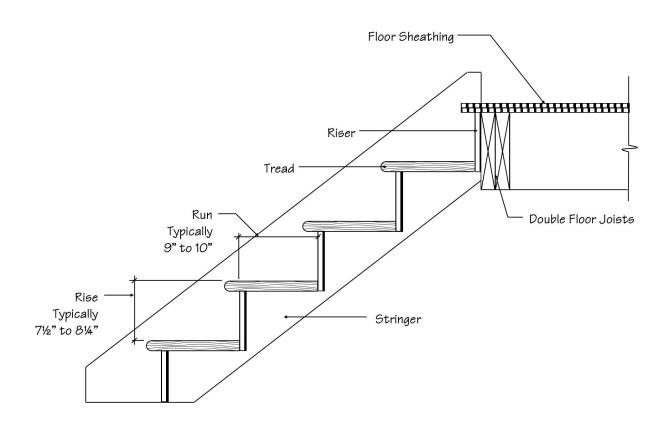


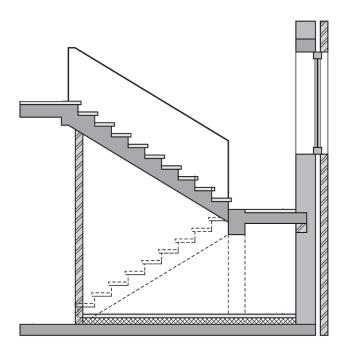
# **Roofing materials**

1.		
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# **Stair Construction**







# **Pressure-Treated Lumber**

For rot to occur in wood		
1	2	
3	4	
Pressure-treating eliminates		_
Pressure-treated lumber cons	iderations	
1	2	
3	4	
Factory-Built Housing		
Types of Factory-Built Housing	g	
1	2	
3	4	
Factory-Built Advantages		
1	2	
3	4	



# **Concrete Materials & Quality**

Concrete is a mixture of	
1	2
3	4
5	
Concrete Reinforcing	
1	2
Joint in Slabs	
1	2
Concrete Quality is Relative to	
1	2
3	4

Words of Wisdom

"We provide a lifetime guarantee on concrete — It's guaranteed to crack sometime in its lifetime."

— Dennis Walsh



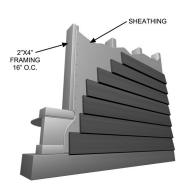
# **Exterior Finish Materials**

## Exterior siding/finish materials

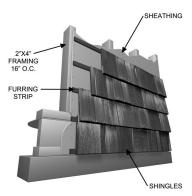
- 7.

A square of roofing or siding covers \_\_\_\_\_

# **Horizontally Applied Siding**



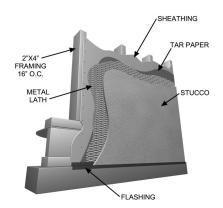
# Wood Shingle & Shakes



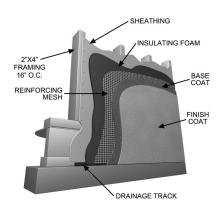
# **Siding Materials**



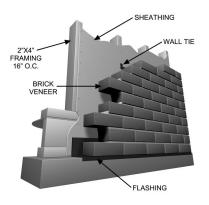
# **Cement Stucco**



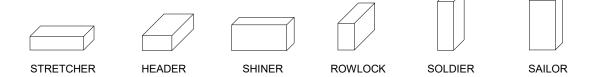
# Synthetic Stucco — EIFS



# **Brick Veneer**



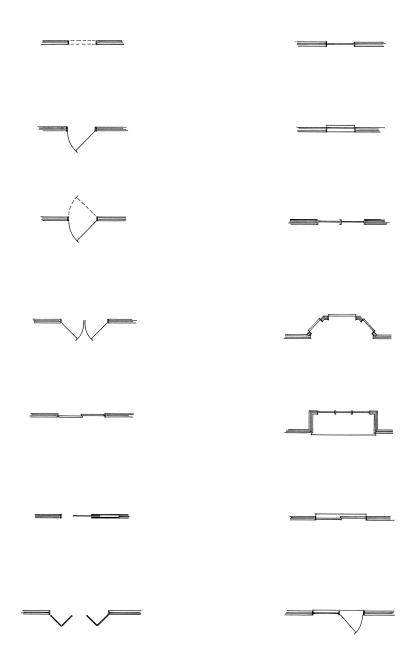
# Terms applied to various brick positions:





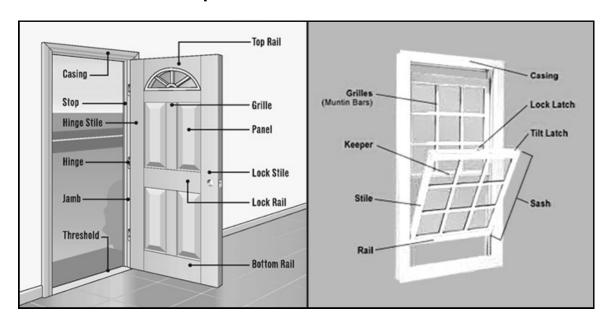
# **Doors & Windows**

# Door and window blueprint symbols



# **Doors & Windows**

# **Door & Window Components**



# **Exterior doors**

1.	
3.	
Inte	rior doors
1.	
2.	



# **Doors & Windows**

# Window frame and sash options

1	
2	
3	
4	

# Window glazing options

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# **Energy Performance Ratings**



# World's Best Window Co.

Millennium 2000+

Vinyl-Clad Wood Frame Double Glazing • Argon Fill • Low E Product Type: **Vertical Slider** 

# **ENERGY PERFORMANCE RATINGS**

U-Factor (U.S./I-P)

0.35

Solar Heat Gain Coefficient

0.32

# ADDITIONAL PERFORMANCE RATINGS

Visible Transmittance

0.51

Air Leakage (U.S./I-P)

0.2

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for any specific use. Consult manufacturer's literature for other product performance information.

www.nfrc.org

# **Window Types**









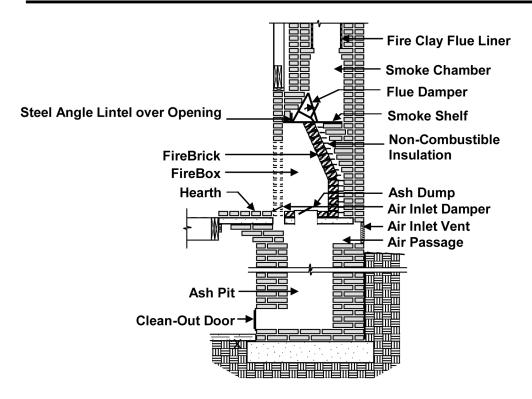








# **Masonry Fireplace Construction**



# **Factory-Built Fireplaces**

Zero-clearance	
	Double-Wall Metal Flue & Chimney Sections
Factory-built fireplace types:	Glass Doors — Insulated Ext. Wall
1.	Fire Box Zero-Clearance Metal Fireplace
	Hearth Assembly
2	Conventional Floor Framing
•	Sheathing & Sheathing
•	
•	Zero-Clearance Fireplace / Section
3	
4.	





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**Electrical Symbols** 

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# **Solar Systems**

# **Primary components**

- 1. \_\_\_\_\_

# Types of solar systems

- 2. \_\_\_\_\_

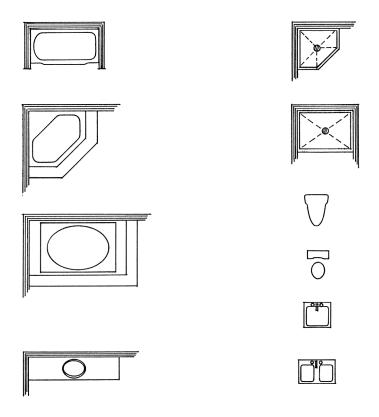


# **Heating and Cooling Systems**

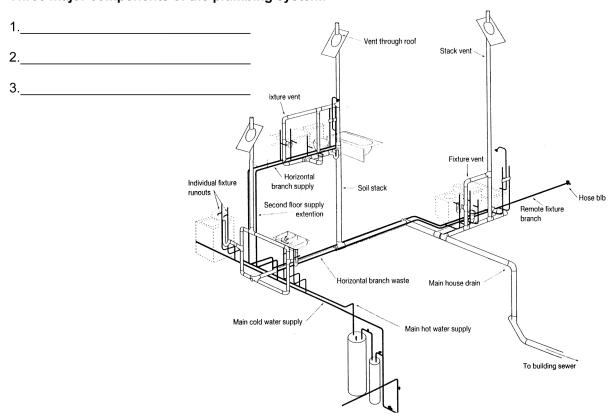
Types of heating systems:	
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3	-
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HVAC	
AFUE	
SEER	
Water Heaters	
Types of water heaters	
1	-
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# **Plumbing Symbols**



# Three major components of the plumbing system:





# **Energy Efficient Construction**

# We minimize the transfer of heat energy

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# **Insulation Materials**

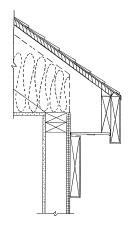
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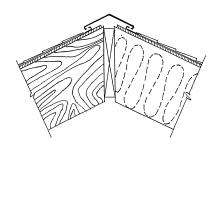


# **Insulation R-Values & Roof Ventilation**

Insulation Material	Thickness	R-Value
Blankets or Batts		
Fiberglass/Rockwool	3½"	11 to 13
	5½"	19 to 21
	9"	30
	12"	38
Loose Fill		
Fiberglass/Rockwool	5"	11
	7-8"	19
	10-13"	30
Vermiculite	1"	2.27
Cellulose	1"	3.33
Rigid Boards		
Fiberglass	1"	4
Fiberboard	1"	1.5 to 2.5
Expanded Polystyrene	1"	3.6
Extruded Polystyrene	1"	5.4
Polyisocyanurate	1"	7.4
Expanding Spray Foam		
Closed-Cell	1"	6 to 7
Open-Cell	1"	3.6 to 3.9

# **Roof Ventilation**







# **Green Building**

# Green building principles

1.	 	 
5.		

**LEED** - Leadership in Energy and Environmental Design **ENERGY STAR** - U.S. Environmental Protection Agency NGBS - National Green Building Standard









# **Interior Wall Finishes**

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# **Cabinet Types**



# Countertops

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# **Flooring**

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# **Moldings & Trim**





# Paint Types & Quality

Paint components	
1	<u> </u>
2	
3	
Paint types	
1	
2	<u> </u>
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Paint sheens	
1	3
2	4
Quality considerations	
1	4
2	5
3	6
Primers	







# Stains & Finishes

Stain types			
1			
2			
Transparency			
1			
2			
3			
Clear finishes			
1			
2			
Wood sealers			
Wood preservatives			



# **Building & Zoning Codes**

Building code concerns			
1			
2			
3			
4			
5			
6			
7			
Zoning code concerns			
1			
2			
3			
4			
5			

# **Congratulations!**

You've completed the Residential Construction Certified™ professional designation training program. We wish you success in your real estate endeavors!

Your friends Dennis, Teresa and the Dennis Walsh and Associates team.

## Α

## Access panel

Removable panel that allows access to plumbing or electrical connections, such as below a platform tub.

## **Acoustical ceiling**

Ceiling made up of materials that absorb sound to reduce the transfer of noise in a building

## **Admixtures**

Materials that are mixed into concrete to somehow change the nature of the mix, such as color or a curing accelerator used in cold weather.

#### Adobe

Clay soil used to create bricks that are sun-dried and used for constructing walls.

## Aggregate

Gravel, stones, shells or other solid materials that are added to the concrete mix for strength or aesthetic purposes.

## Air quality

Measurement of the level of contamination of air in the building due to the buildup of chemicals and odors from building materials and occupants.

## Air-vapor barrier

Material used to eliminate the passage of air and moisture through walls, floors and ceilings, most commonly a layer of polyethylene plastic installed behind the drywall or below a concrete slab.

## **Anchor bolts**

Treaded metal bolts that are installed in the concrete at the top of a foundation used to secure the wood plates that connect to floors and walls.

### **APA** rated

Rating given by the American Plywood Association that established the correct use of panel materials such as plywood and waferboard.

#### **Apron**

Interior trim molding applied below a window stool.

## **Architect**

Individual who designs and oversees building construction, usually used to refer to someone who is registered and licensed by the American Institute of Architects.

## Ash dump

Metal door that opens in the bottom of a fireplace to allow ashes to be "dumped" to a hollow ashpit below.

## **Asphalt shingles**

Roofing material made up of a mineral fiber mat that is impregnated with asphalt for waterproofing and covered with a decorative aggregate material.

## **Astragal**

Narrow wood molding usually installed vertically between double doors.

### **Azimuth**

Horizontal angle used in surveying to layout the boundaries of a parcel of land relative to the directions of the compass.

## В

### **Back band**

Separate, outermost trim piece that is used outside the casing around an interior window or door opening. This is a traditional colonial detail.

### **Backfill**

Material such as dirt or gravel used to fill in the open area around a foundation, also the act of filling in this area.

## Backsplash

Material applied to the vertical area above a sink or countertop to protect the wall finish from moisture.

## Baffles, insulation

Treated cardboard or light plastic pieces installed between rafters directly below the roof sheathing to maintain an airspace for ventilation above the ceiling insulation.

## **Balloon Framing**

Framing method where exterior studs run continuously from the sill plate at the foundation to the top wall plate at the eaves of the roof, very seldom used today.

## **Baluster**

One of the vertical components repeated underneath a stair or porch railing.

#### **Balustrade**

Stair or porch railing.

## **Barrel vault**

Upside-down U-shaped design used at a vaulted ceiling.

#### Base board

The interior molding installed at the bottom of a wall.

## Base molding

Another term used to describe the baseboard.

## Base shoe

Strip of molding installed along the bottom of the baseboard, used most often in areas with hardwood, ceramic tile or marble floors.

### **Battens**

Thin strips of wood applied over seams in wider boards, usually in a vertical application to create board and batten siding.

### **Batts**

Insulation material manufactured in varying widths and thickness to allow for easy installations between rafters and studs, also called blankets.

## **Bay window**

Three-sided, angled window configuration that projects from the walls of a building.

#### **Beam**

Large piece of built up lumber, timber, metal, stone or other structural material installed horizontally in a building to support structural loads.

## Bearing wall

Wall supporting loads from above, including joists, rafters or other walls.

#### **Beltboard**

An exterior trim board installed horizontally directly below the soffit area.

## **Bevel siding**

Siding material that is triangular in shape and installed horizontally with each piece overlapping the piece below.

## **Bid drawings**

Architectural drawings created for the purpose of securing bids or cost estimates from contractors and suppliers.

## Blind nailing

Nail installed so that the head of the nail is covered by another piece of finish material and therefore not visible after completion.

#### Blocking

Short lengths of wood installed perpendicular to studs, joists and rafters to provide additional structural strength or to provide support for the installation of hardware during the finish.

## **Board & Batten**

Vertical wood siding consisting of wide boards placed side-by-side with narrow batten strips that cover the joints.

## **Boiler heating**

Heating system that uses boilers to heat water that is then pumped through pipes and radiators to heat the air.

## **Boundary survey**

Survey that establishes the corners of a property and often includes stakes and ribbons to clearly identify property lines.

## **Brick veneer**

Full-thick brick that is used as the exterior finish on a wood frame building.

## **Bridging**

Solid or crisscrossed boards used between joists to add additional strength to a floor system.

### **Brown coat**

Layer of coarse plaster applied beneath the finish coat in interior plaster work or exterior stucco.

## **Building orientation**

Placement of the building on the site relative to the weather, sunlight, views or other considerations.

## **Building permits**

Series of documents and approvals issued by various government offices that are required prior the start of construction.

## **Building systems**

Various combinations and methods of utilizing materials and labor, often using factory-built components, to create a building, such as panelized or modular construction.

## **Built-up roofing**

Combination of sheet materials, adhesives, waterproofing membranes and sometimes aggregates to create a roofing system, most often used on flat or low slope roofs.

#### **Bulkheads**

Another term used for interior soffits built above wall cabinets or vanity areas.

### **Bull nose**

Finish material applied to an edge such as a countertop or step.

## Butyl

Type of caulk used to ensure waterproof seams between building materials

# C

#### CAD

"Computer-aided-drafting" systems used by builders and designers to create architectural drawings.

## Cantilever

Beam or section of floor that extends beyond the wall below.

## **Cased opening**

Opening between rooms without a door that is trimmed with wood jambs and casing, considered an upgrade from a drywall-wrapped opening.

#### **Casement window**

Window hinged along one vertical side that opens and closes similar to a door.

#### Casing

The molding installed around a door or window opening.

## **Cathedral Ceiling**

Ceiling with 2 sides sloping towards the center of the room.

#### Cedar

Reddish-brown wood that is used as exterior siding and roofing due to its ability to resist decay and rot in exposed conditions.

## Cement

Material made by grinding limestone and clay to a fine powder, usually mixed with water and sand to make mortar or by adding aggregates to make concrete.

### Ceramic tile

Durable, but brittle tiles used for walls, floors and roofs that are created from clay heated to very high temperatures.

### Check valve

Valve used in a pipe that carries fluids to allow movement of the fluid in only one direction.

## **Chemically treated**

Usually refers to wood products that are treated with chemicals to resist decay or to slow fire damage.

## Chimney

Vertical structure or flue that allows the passage of smoke and gases from a furnace or fireplace into the air safely above a roof.

## Chimney cap

Metal or masonry material used at the top of a chimney or flue to prevent water from leaking into the chimney structure.

## Cladding

Material applied to another material to change its appearance or ability to resist wear or decay, such as in vinyl or aluminum clad doors and windows.

## Clapboard

Narrow, beveled boards applied overlapping horizontally as exterior siding, also called bevel or lap siding.

## Clay tile

Roofing or floor tiles created by heating natural clay materials, also sometimes used to describe drainage pipes or "drain tiles" made of this material.

### Cleanout

Opening that allows access to pipes, drain lines or an ashdump for cleaning.

#### Clerestory

Vertical wall that rises above a section of roof with windows installed to bring natural light into a building.

### Closed valley

Valley construction where shingles are overlapped at the center of the valley.

#### Collar tie

Horizontal framing member installed above the ceiling joists between rafters to strengthen the roof system.

#### Column

Vertical component of a structure, usually made of wood, concrete or metal, used to support loads above or for aesthetic purposes.

### Concrete

Building material created by mixing cement, sand, gravel, water and other admixtures that is poured in place wet and then through a chemical reaction, cures or hardens to a solid.

### **Control joints**

Small cuts or joints trowelled into the surface of a concrete slab in a decorative pattern to attempt to "control" the direction of cracks that appear over time.

## Corner bead

Metal or plastic piece applied where drywall meets at a right angle to provide a rigid, straight line behind the joint compound.

## **Corner braces**

Diagonal lengths of wood or metal applied at the corners of exterior walls behind the sheathing to provide structural reinforcement.

#### Cornice

Horizontal moldings that project from the face of a wall to create a crown or cap.

## Cove molding

Molding with a concave curve used for various trim purposes.

## Crawl space

A foundation system that raises a wood floor several feet above grade, providing a low space beneath the floor for access to mechanicals.

#### Creosote

Oily, brownish liquid from coal tar that is applied to wood to act as a preservative.

#### Cricket

Small, gable roof-shaped structure that is installed above a chimney to divert rainwater around the chimney.

## Cripple studs

Short studs installed below a window sill or above a header to provide backing for the wall finish material.

## **Crown molding**

Molding typically used at the intersection of a wall and a ceiling. Simpler crowns are single strips of wood molded in a decorative shape. More ornate crown moldings are built-up of several separate molding pieces.

## Cupola

Small structure, usually rectangular with a peaked roof, built on top of the roof of a building, sometimes for ventilation, sometimes for decorative purposes.

#### **Curtain drain**

French drain installed at an elevation above the leach field area of a septic system to collect surface water before it runs over the leach field and carries effluent to neighboring properties.

## Cut and fill computation

Calculations made to determine the proper amount of soil to excavate from a basement and the corresponding placement of soil around the basement on the finished site.

## D

### **Damper**

Adjustable metal plate in the flue of a furnace, fireplace or ductwork to contol the flow of air or exhaust.

## **Dead bolt**

Lock installed above the handset with a solid bolt for additional security.

### **Dead load**

Engineering calculation that measures the average weight of the structural components in a floor or roof system.

#### Dentil

Molding that consists of repeated tooth-like blocks usually applied below an overhang or as a component of a built-up crown molding.

## **Distribution panel**

Electrical panel that distributes electricity from the main to various circuits throughout the building, typically holds banks of circuit breakers.

#### Dormer

Smaller structure made up of three walls, a window and a roof that projects through the main roof of a building.

## **Double glazing**

Assembly of two panels of glass with a narrow air space between them installed in a door or a window to provide increased energy efficiency over a single-pane design.

## **Double-hung window**

Window with both an upper and lower sash that can be slid vertically to open and close.

#### Drain tile

Term used to describe perforated plastic or clay pipes installed below grade to collect water in the soil and carry it away to a storm sewer or surface runoff.

## Drip edge

Thin metal flashing applied to the edges of the roof sheathing to direct rain water down to the gutters or siding.

## **Dropped ceiling**

False ceiling installed below an existing ceiling, often used to hide exposed pipes or ductwork.

## **Drywall**

Paper-covered gypsum board used for the finish interior wall surface. Joints are concealed with paper tape and plaster-like joint compound.

#### **Ducts**

Manufactured in galvanized metal, fiberglass board and flexible plastic, ducts are used to distribute conditioned air from heating and air-conditioning systems, and to vent exhaust fans in kitchens and bathrooms.

## Ε

#### Eaves

Lowest edge of a roof, typically above an exterior wall.

### **Efflorescence**

White, powdery substance that sometimes appears on brick walls.

## **Elevations**

Describes architectural drawings that provide a representation of a vertical surface such as the exterior of a building.

### **Excavation**

Process of using heavy earth-moving equipment to dig areas for foundations and other site work.

## **Expansion joint**

Joint constructed in concrete slabs filled with a flexible, compressible material to allow for the expansion and contraction of the concrete relative to changes in temperature.

#### **Exterior elevation**

Describes the finished exterior of a building or architectural drawing that shows these finished exterior views.

## F

### **Face brick**

Brick applied to create a finish over a structural wall or chimney.

#### **Fascia**

Collectively describes the various finish materials and trims that occur along the edges of a roof.

## Fiber glass

Material typically used in a loose or batt configuration for insulation purposes.

#### Filter fabric

Heavy fabric sheet installed below base stone in a driveway or over the gravel around a foundation to minimize contamination from fine soil and mud.

#### Finish carpentry

Process of installing interior doors, cabinets, moldings and finish hardware.

## Finish nails

Fine nails with small heads used to apply finish moldings and trim materials.

#### **Firebox**

Opening inside of a fireplace, lined with fire brick, where the fire burns.

## **Firebrick**

Light-colored brick used inside the firebox.

### Fire-rated

Rating established for building materials that represents their performance during a fire, required for certain materials by building codes.

## **Firestopping**

Horizontal framing installed between studs to minimize the possibility that fire can pass quickly up the wall cavities.

# Fixed glass

Glazing installed in a door or window without a moveable sash.

### **Flashing**

Materials used to eliminate the passage of water at roof areas, sidewalls, windows and doors, usually made of metal.

## **Flight**

Uninterrupted series of steps between floors or between a floor and a landing.

## Flood plain

Geographic area designated by the Army Corps of Engineers as being potentially subject to flooding at some time in the future.

## Floor joists

Horizontal framing members, usually 2x8's or 2x10's, used to create the structural framework of a floor.

### Flue

Terra cotta or metal lining for a chimney or furnace vent.

## **Fluting**

Vertical decorative grooves in a column typically used at fireplaces or entry doors.

## **Footing (Or Footers)**

Structural component at the base of the foundation that transfers the loads of the building to the soil below. Footings (or footers) are usually constructed of concrete poured directly on stable, bearing soils.

## Forced air system

System of plenums and ductwork where fans move conditioned air through a building.

#### **Forms**

Wood, plastic or metal assembled to support wet concrete before it cures.

### **Foundation**

Combination of components below grade, including footings, basement walls, crawl space walls, columns, piers, pilings, etc., that supports the structure.

## **Framing**

Term applied to the process and materials used to create the rough structure of the building.

## French drain

Trench filled with gravel with some form of drain pipes installed at the bottom to collect surface water away from a building.

## **Furring**

Wood strips applied to provide either an air space or to provide a nailing material for the installation of sidings and finishes over concrete, block, or foam materials.

## G

#### Gable

Vertical, triangular-shaped area of wall that occurs where the ridge of a roof meets the end of the structure.

#### Gable roof

Triangular-shaped roof that results when two sloping roof planes meet along a horizontal edge.

## Galvanized

Metal coated with rust-resistant zinc.

## **Gambrel roof**

Ridged roof with dual slopes on each side of the ridge, the lower slope being of a higher pitch.

## Glazing

Term used to describe various types and combinations of glass used in a window, door or skylight.

## Glue-lam

Short for "glue-laminated," describes structural components, most often beams, made up of pieces of dimension lumber glued together.

### Grout

Mortar-like material, usually colored, used to fill space between floor and wall tiles.

## **Gypsum**

White material used in the production of plaster, joint compounds and drywall which is sometimes referred to as gypsum board.

## Н

## Header

Structural component that carries loads across an opening, typically constructed of standard lumber, laminated wood products or steel.

#### Hearth

Horizontal, non-flammable finish surface installed at the front of the fireplace below the firebox opening.

#### Heat pump

Device that utilizes a compressor system to heat and cool a building.

## Hip roof

Roof shape that results from triangular roof surfaces that slope upward, away from the eaves.

## Hollow-core door

Door used most often at interior locations constructed with a relatively thin layer of veneer on each face and a lightly reinforced hollow core.

## Hose bib

Exterior water faucet.

## House wrap

Fabric like materials that are wrapped around the exterior sheathing of a building to eliminate air infiltration while still allowing moisture to escape from the wall cavity, can significantly reduce energy costs.

## **Hurricane clips**

Various types of metal anchors and connectors that are used to securely connect structural components in a building to increase resistance to damage from storms and wind.

## **Hydrostatic Pressure**

Moisture in the soil that builds up, creating pressure against foundation walls.

## I

### Infiltration

Movement or leaking of air through the exterior shell of a building, often measured in "air changes" which represent the complete replacement of interior, conditioned air with air from outside the structure.

## Insulating sheathing

Various types of exterior sheathing materials that are designed to reduce energy loss.

## J

### Jack stud

Stud at each side of an opening that is cut short to support the header above.

#### Jamb

Finish material applied around the inside of a door or window opening.

#### Joist

Horizontal framing members that support a floor or ceiling joists, headers and beams.

## Κ

## Knee wall

Low wall in an attic or half-story space.

## L

### Laminated veneer lumber

Sometimes called a "micro-lam", structural components, usually used as beams or headers, made up of thin veneer layers much the same as plywood.

## Lap siding

Exterior siding applied horizontally and "lapped" over the board below such as clapboard siding.

### Lath

Material installed as a backing material for plaster, stucco and sometimes tile installation, lath is usually a metal mesh, but sometimes rough wood strips or gypsum board.

## Lintel

Used interchangeably with the term "header," a lintel is a horizontal component that carries loads from above across an opening, such as a steel angle in brick work.

## Live load

Engineering term that describes changeable loads in a structure, usually calculated on a square foot basis, such as loads from people, snow, or winds.

## Low-E glazing

Various types and combinations of glazing that utilize glass, reflective films, suspended films and gas injected in the space between the glass to reduce energy loss.

## M

### Mansard roof

Roof shape with two slopes on each side, the upper slope being a very flat pitch, and the lower slope, which often covers the side wall of the upper floor area, being a very steep pitch.

#### Mantel

Shelf assembly, usually with a crown mold below it, that is constructed above a door, window, or most commonly, a fireplace opening.

## Marine plywood

Plywood panels constructed with special waterproof adhesives to allow material to stand up to extremely wet applications.

## Masonry

Any construction that involves the use of stone, brick or block materials such as exterior veneer, foundations, or fireplaces.

#### Mechanicals

Term used to describe the trades or work involved in the installation of plumbing, electrical, and HVAC systems.

#### Metal door

Refers to a door constructed with a thin metal skin, usually embossed with decorative panels, over a core of insulating foam.

## **Metal lath**

Metal mesh material that is attached to walls, floors and ceilings as base for plaster, mortar for stone work or thinset for tile and marble installation.

### Mini Splits

Mini-split HVAC systems are energy-efficient, ductless heating and cooling units that consist of an outdoor compressor and one or more indoor air-handling units, providing zoned climate control.

## Miter joints

Joints in lumber or moldings where diagonals are cut to fit the pieces around an angle such as at the corners of windows and doors.

## **Modular construction**

The construction of a building using sections that are built in a factory and then assembled together in the field to complete the structure. Modules usually include finished interior and exterior components as well as mechanicals that are spliced where modules meet.

#### Mortar

Various materials that are used to bond masonry materials together such as brick and stone, normally a mixture of cement, sand and water.

## **Mortise**

Rectangular hole cut into wood that receives a tenon from another piece to make a connection, used in furniture and post and beam framing.

#### **Mullions**

Vertical strips that separate panes of glass in a door or window, also used to describe removable grills or grids to create the appearance of separate panes.

## N

## **Newel post**

Post that supports a hand rail at the landing or starting step of a staircase.

### **Nominal dimensions**

Used to describe various sizes of lumber typically used in construction, although actual dimensions are different, i.e. a 2x4 is actually 1 1/2" x 3 1/2".

## Nosing

Projecting edge that trims a step.

## 0

## Open riser

Stair construction that uses no riser between treads for an open appearance.

## Open soffit

Exterior soffit construction where no finish material is installed to cover the overhang area, leaving the tails of the rafters exposed.

## Open stringer

Staircase construction where stair treads extend with a nosing over the decorative stringer, balusters are then installed directly into the treads.

## Open valley

Valley construction at the roof where shingles are cut back at each side of the valley to expose the metal flashing material.

## **Oriented Strand Board**

Waferboard type panel that uses longer wafers or strands, that are oriented to the length of the panel, creating a directional panel that offers more strength than conventional waferboard.

## P

## Panel clips

Small metal clips installed at the edges of roof sheathing panels between roof trusses to eliminate misalignment of the edges and provide an expansion space.

## **Panelized construction**

Building construction system that utilizes panels, or wall sections, that are assembled in a factory for quicker, more accurate assembly in the field.

## **Panels**

Term used to describe materials manufactured in 4x8 and 4x9 sizes such as plywood, wafer-board, oriented strand board and particle board.

## Particle board

Panel material constructed from fine wood particles, like sawdust, and glue, typically used as a structural backing material for laminate cabinets and countertops.

## Passive solar heating

Building design that maximizes heat absorption from the sun without active or powered systems.

### **Pediment**

Ornamental triangular trim assembly or gable typically used above doors and windows and as decorative elements at the front of buildings.

### Pier

Masonry or concrete column used to support a floor or porch.

#### Pilaster

Rectangular column, most often structural, that projects slightly from a wall.

### **Piling**

Vertical structural component buried below a building as foundational support, usually pressure treated wood posts, steel columns or concrete.

#### **Pitch**

Slope of a roof, usually described as a ratio between rise and run.

## **Plaster**

Mixture of lime or cement with sand and water that is applied in a wet paste and then dries hard as a finish for walls and ceilings.

### Plat

Parcel of land, or a drawing showing dimensions and details of a parcel or group of parcels.

#### Plate

Horizontal framing members at the top and bottom of a wall. Plate height is often used to refer to the ceiling height of a room.

## **Platform framing**

Most popular system of frame construction, first floor platform is constructed, then walls are built on this, then second floor platform followed by second floor walls, differs from balloon framing.

#### **Plinth**

Square block used as a trim at the base of a column or a casing.

## **Plywood**

Structural panel material constructed of thin layers, or veneers, of wood glued together, typically with alternating grain direction between layers.

#### Porch

Covered area attached to a building, open to the outside on at lease one side.

## **Porte Cochere**

Exterior area covered by roof that allows vehicles to drive through or park under, allows people to enter or exit vehicles protected from the rain.

## Post-tension concrete

Concrete slab construction used in areas with extreme expansive soils, involves the installation of metal cables at opposite directions in the slab which are then put in tension to eliminate cracking and separation due to soil movement.

### Pre-cast concrete

Building construction that uses concrete components for walls, floor and roof structure that are pre-cast in sections in a factory.

## **Preengineered trusses**

Structural components assembled in a factory used for floor and roof construction that utilize lumber or steel along with bracing and steel connector plates.

## **Preliminary drawings**

Architectural drawings used for the purpose of establishing the general design of a building before detailed, or working drawings are finalized, usually used to determine preliminary cost estimates and secure owners approval for final design.

### Pressure treated wood

Lumber and plywood that is treated with a chemical preservative for exterior or extreme moisture conditions, most commonly used in residential construction for exterior decks and sill plates at grade.

## **Protection board**

Various types of sheet materials used around a foundation to protect waterproofing membranes from damage, often also provide additional insulation to the foundation.

### **PVC**

Common plastic material (poly-vinyl-chloride) used for drain pipes such as footer drains and waste lines.

## Q

#### **Quarry Tile**

Machine-made, unglazed tile often used for floors.

## Quoin

Decorative square or rectangular-shaped blocks that project slightly at the corners of a building, commonly made of stone, brick, or stucco.

## R

## R-value

Measure of the resistance of a material to the passage of energy - the higher the R-value, the greater the insulating capability of the material.

## **Rafters**

Structural components that create the shape of a roof, typically cut and assembled piece-by piece on site.

## Raised Slab

Flat concrete foundation elevated with concrete blocks or poured walls and filled with compacted dirt before pouring the slab.

#### Rake

Edge of the roof that runs along the slope.

## Rebar

Short for "reinforcing bar." Steel rod used to strengthen concrete and support connections between slabs and other parts of the structure.

## Reglet

Slit cut into masonry material, such as a chimney, to allow the installation of flashing.

## Ridge

Horizontal line created at the juncture of two sloping roof planes.

## Ridge board

Framing member running along the ridge of the roof. Rafters are nailed to this component.

## Ridge cap

Shingles installed as finish course at the ridge.

## Ridge vent

Vent system installed along the ridge of the roof to provide ventilation for the roof area.

#### Rise

Vertical distance measured from the base of a stairway to the top, from tread to tread, or from the eave of a roof to the ridge.

#### Riser

Vertical finish surface of a stair between two treads.

### **Roof window**

Similar to a skylight, but with an opening sash.

#### Rough in

Preliminary stage of installation of plumbing, HVAC, electrical wiring, etc. prior to the application of finish surfaces and materials.

## **Rough Opening**

Opening that must be framed in a wall to allow for the installation and shimming of a door, window or other components.

#### Run

Horizontal distance covered by a stair or roof.

## S

#### Sash

Framework that holds the panes of glass in a window, which moves in a window that opens.

## Scale

Mathematical relationship between one thing and another, such between the architectural drawings and the actual structure itself.

### **Scissor truss**

Roof truss that creates a cathedral ceiling with an interior slope.

## **Sconce**

Wall-mounted light fixture.

## **Section drawing**

Architectural drawing that provides a view of the structure or a component as a vertical slice.

## **SEER rating**

"Seasonal energy efficiency ratio" used to rate the efficiency of cooling equipment.

#### Shakes

Hand-split wood shingles of varying thickness with an irregular surface.

## **Sheathing**

Various building materials applied to floors, walls, and roofs that create the surface for application of finish materials.

## Shed roof

Roof shape with only a single slope, usually attached to the side of a structure.

#### Sheetrock

A brand of drywall manufactured by U.S. Gypsum, commonly used to describe the material.

#### Shim

Slim, beveled piece of wood used to fill small spaces in framing and trim, such as around windows and doors.

## **Shingles**

Thin, usually rectangular pieces of material, such as wood, slate or asphalt roofing, overlapped to create a weatherproof layer over a roof or a side wall.

## Shiplap

Shape milled into the edge of material, such as wood siding, that allows an edge to overlap another.

### Shoe

See "base shoe".

## Sill

Horizontal member at the base of windows or the lowest member of the framework of a wall, sometimes called the mudsill.

#### Sill plate

Piece of lumber applied over the top edge of a foundation used to secure floor framing above.

## Single-hung Window

Window that resembles a double-hung, but only the lower sash is operable.

#### Sleeper

Wood member resting on a concrete slab, used to support and raise a finished floor.

## Soffit

Underside of an overhang at the eaves of a roof or the ceiling bulkhead constructed above cabinets or vanity areas.

### Soil bearing capacity

Measurement of the ability of a soil to support structural loads from a structure.

## Soil pipe

System of pipes, usually PVC, used to carry water and sewage from the fixtures to the sewer or septic.

### Soil stack

Main vertical plumbing pipe that collects drainage and waste materials from sinks, toilets, tubs and showers.

## Sound attenuation blanket

Fiberglas insulation type material used to deaden the transfer of sound through areas of a building.

## Span

Horizontal distance between bearing points supporting rafters, trusses and joists.

## Splash block

Flat material, usually concrete or wood, placed on grade below a downspout to direct water away from the building.

## Square

Term used to describe the quantity of roofing or siding material needed to cover 100 square feet.

#### Stakeout

Act of measuring and driving stakes in the ground to indicate the location of a building, driveway, septic system or other improvement prior to excavation and construction.

## Steel door

Another term used to describe metal door.

#### Stile

Vertical framing members of a paneled door.

## Stool

Interior trim sometimes installed at the sill of a window that creates a narrow shelf.

### Stringer

Boards at the side of stairs that slope up the wall at an angle.

## Stucco

Plaster, made with portland cement, sand and water that is sometimes used as an exterior finish, synthetic stucco, also known as EIFS, is more commonly used in residential and commercial construction today.

#### Stud

Vertical framing components of a wall, usually a 2 x 4 spaced 16 inches on center.

## Subfloor

First layer of sheathing applied over the joists in a double-layer floor construction.

## Sturdi-floor

American Plywood Association designation for a single-layer, glued floor system.

## Sump pump

Pump installed below grade, usually in a basement, to pump ground water up and away from a building.

## Suspended ceiling

See "dropped ceiling"

## Т

### **Tankless Water Heater**

Tankless water heaters, also known as on-demand water heaters, heat water directly without the use of a storage tank, providing a continuous supply of hot water while saving energy by heating water only as needed.

### Terra cotta

Reddish-brown, fired clay often used for flowerpots, floor tiles, and ornaments.

### **Terrace**

Paved outdoor area, sometimes raised.

#### **Thinset**

Mortar-like setting material used for the installation of ceramic tile and marble.

#### **Toenail**

Nail driven at an angle to the framing member.

## Tongue and groove

Shape milled into the edge of board that allows for an overlapping connection, as in T&G flooring.

#### Topographic survey

Survey that measures the relative elevations or grades on a site, typically based on the relationship to mean sea level.

### **Transom**

Window installed above other windows or doors.

#### Trap

U-shaped bend in a drain or waste line that holds a small amount of water to prevent sewer gases from entering the house.

## Tray (Trey) Ceiling

Flat ceiling with the center portion raised and the vertical areas surrounding usually sloped.

## **Tread**

Horizontal part of a stair upon which you step.

## **Treated wood**

See "pressure-treated wood."

### Trim

Decorative molding, the act of installing moldings and finish materials.

### **Truss**

Engineered structural component, assembled from wood members, metal connectors, designed to carry structural loads such as in a roof or a floor system.

## U

## Underlayment

A layer of panel material, such as plywood, installed just below the finish floor.

## **Utilities**

Describes gas, electric, telephone and other such services brought to the building.

## V

## Valley

Internal angle formed by two sloping planes of a roof.

## Vapor barrier

Paper or plastic material installed directly behind the interior wall finish used to prevent moisture from moving through a wall.

## **Vaulted Ceiling**

Ceiling that rises above the wall height with one or more slopes or angles.

## Veneer

Thin sheets of wood, such as the layers in a piece of plywood.

## Ventilation

Movement of air through roof cavities important to controlling moisture, elimination of stale air from inside the building.

## Veranda

Long covered porch.

## Vestibule

Entry foyer.

## W

## Waferboard

Structural panels manufactured using chips or wafers of wood glued together and sealed, used primarily for floor, wall and roof sheathing.

## Wainscot

Wood paneling, usually on the lower part of an interior wall.

## Wall tie

Small corrugated metal strap bent and nailed in place to connect brick and stone fascia to a side wall.

## Wallboard

Term usually used to describe drywall.

## Waste pipes

See "soil pipes."

## Weep hole

Small drain holes installed at the base of brick veneer walls to allow moisture to escape.

## Wind load

Measurement calculated by engineers to determine the structural design necessary to stand up to the force of severe weather gales.

## Wire mesh

Metal wire manufactured in a grid work, usually 6" x 6", installed in a concrete slab to minimize the separation of concrete due to cracking and settling.

## Wolmanized wood

Brand name of pressure-treated wood.

## **Wood Floor System**

Floor system constructed of wood framing including floor joists and floor sheathing typically suspended over a crawl space, basement or other area of the structure.

## Working drawings

Final version of the architectural drawings approved and used for the actual construction.

# Ζ

## Zoned heating system

System that separates the building into areas, or zones, to allow for separate control of levels of heating and cooling to maximize comfort and energy efficiency.