HOW WE BUILD, STEP BY STEP FROM FOUNDATIONS TO FINISHES

Guide to Owner Builders Presentation

Course Outline

HOW WE BUILD, STEP BY STEP FROM FOUNDATIONS TO FINISHES

FRAME CONSTRUCTION

Learning Objective:

To understand that wood frame construction can be quick and efficient

- Construction times of 3 to 4 months are typical for wood frame homes of 100 to 200 m2 (1000 to 2000 ft2).
- Construction times will increase with increased size and complexity.
- Canadian wood frame homes are built in all climate zones of the country most of the year.
- The only wet trades that are typically used are the drywall tapers and if stucco is used as an exterior finish stucco applicators (plasterers).

FOUNDATION CONSTRUCTION

Learning Objective:

To understand the foundation construction process

Foundations are typically poured concrete reinforced with steel using dimension lumber and plywood forms, metal cross ties are typically use for holding forming plywood parallel for taller foundation walls. Metal strap or J bolts are cast into the top of the foundation walls for later tying down the sill plates. The wood used in forming maybe recovered for use later in the home. In some locations reinforced concrete block foundations are used.

FOUNDATION CONSTRUCTION PROCESS

Learning Objective:

To understand the foundation construction process

After the forms are stripped the outside face of the concrete is sprayed with an asphaltic mastic damp proof coating that seals off the pours of the concrete to prevent ground water penetration by capillarity. Drain tile is installed beside the footings and covered in drain rock and it is in turn covered with a filter fabric. A drainage plane of drain rock, dimpled plastic sheet or high density mineral wool board is placed against the outside of the foundation wall. The base of the drainage plane is buried in the drain rock that surrounds the drain tile to ensure the water intercepted by the drainage plane is directed away. A sill gasket is then placed over the top of the concrete wall to provide a capillary break between the sill plate and the foundation. The concrete wall maybe backfilled at this point or back filling may occur later after the floor joists are in place. The basement or crawlspace floor slab will be poured over a polyethylene sheet damp proofing after the roof has been completed.

FLOOR FRAMING

Learning Objective:

To understand wood frame floor construction sequencing

- A 38mm x 89mm (2x4) sill plate is pre drilled for anchor bolts and laid on the sill gasket, the sill is then anchored down with nuts and washers. In some cases anchor straps are used in place of the bolts, the anchor straps previously cast into the foundation are wrapped over the top of the sill and nailed.
- If the sill is to form part of the air barrier a continuous bead of one part urethane is applied to the inside corner of the sill and concrete wall to form an airtight seal.
- The floor joists are then usually laid on flat on the sill plates.
- If the rim joist is to form part of the air barrier a continuous bead of construction adhesive is run where the rim joist will rest on the sill plate.
- The header or rim joist is then toe nailed to the outside edge of the sill plate.
- The floor joists are then rotated up on edge and placed on the sill, the floor joists are then end nailed to the rim joist.
- Once all the floor joists are nailed in place diagonal cross bracing is nailed in place at mid span or off set solid blocking is used to prevent the joists from rotating.
- If the rim joist is to form part of the air barrier a continuous bead of adhesive is run along the top of the rim joist.
- Construction adhesive is applied to the tops of the joists and the floor sheathing is laid down and nailed or screwed.

SEQUENCING FOR WOOD FRAME FLOORS

Learning Objective:

Construction sequencing for wood frame floors

Floor sheathing is tongue and groove plywood placed over the floor joists

JOIST HANGERS AND ENGINEERED WOOD BEAMS

Learning Objective:

Construction sequencing for wood frame floors, use of joist hangers and engineered wood beams

Floors that is incorporating a Parallam engineered wood beam. The floor joists perpendicular to the beam are attached using metal joist hangers. This allows the tops of joists and beam to be flush.

WALL FRAMING

Learning Objective:

To understand how exterior walls are framed

One of the advantages of platform frame construction is that once the floor has been framed it provides a flat and level surface upon which the interior and exterior walls can be framed and erected. The exterior walls are laid out with the locations of the studs marked on the top and bottom plates. The studs, which are usually supplied precut, are then end nailed through the top and bottom plates. A double top plate is usually used at the top to increase it's ability to carry vertical loads that do not line up directly over studs. Lintels for window and door openings are nailed to studs on either side and rest on cripples that carry the vertical loads. Depending on the air and vapour barrier systems being used a strip of polyethylene or house wrap maybe placed between the double top plates. After the stud and plate framing is complete the frame is covered with sheathing which is nailed in place. After the sheathing is installed the wall is tilted up and nailed to the floor. Interior walls are framed in a similar manner except that they are not sheathed. If a polyethylene air vapour barrier is to be used partition walls located below insulated ceilings will have a strip of polyethylene places between the double top plates.

Advanced framing techniques reduce lumber and labor costs

STRUCTURAL LOADS TRANSFERRED OVER TOPS OF DOORS AND WINDOWS

Learning Objective:

To understand how structural loads are transferred over the tops of doors and windows.

To transfer vertical loads that are being carried down the wall around doors and windows small beams called lintels are built into the wall framing. Lintels are typically made of two pieces of 38mm (2x) lumber ranging from 38mm x 89mm (2x4) or 38mm x 286mm (2x12) depending on the span. In some cases LVL or Parallam lintels are used. The lintel is typically supported by short studs on either side called cripples, that are each nailed to a full height stud. The lintel members maybe nailed directly to each other or there maybe spacers used to make the lintel match the depth of the studs and at the same time promote drying. Some builders will sandwich foam board insulation between the lintel members to reduce heat conduction through the framing at this point. Pieces of blocking are placed above the lintels to carry the load down from the plate above.

SHEATHING PAPERS

Learning Objective:

To understand the types of sheathing papers and how to apply them

A layer of sheathing paper also known as sheathing membrane or weather resistant barrier (WRB) is typically stapled to the outside face of the plywood or OSB sheathing. This layer will let water vapour pass through to allow drying during the heating season and at the same time will resist the entry of rain into the wall. The earliest forms of sheathing paper consisted of heavy paper or cardboard that was impregnated with asphalt or tar, derivatives of this technology are still in use today and are referred to as building paper. Building paper is rated by a standard test method for water penetration, building paper typically used in Canada would be rated as 30 minute or 60 minute paper. More recently spun-bonded polyolefins or house wraps have come into use. These typically have a much higher vapour permeance than building papers although they are also a very effective barrier to liquid water penetration. Sheathing papers particularly spun-bonded polyolefins can be affected by chemicals called surfactants that may leach out of some wood sidings and some stucco. Surfactants eliminate the ability of the spun-bonded polyolefin to resist liquid water penetration. For this reason it is always wise to back prime all wood sidings and provide a vented drainage plane behind all claddings so they are not in direct contact with the sheathing paper. The image shown in this slide shows a spun-bonded polyolefin sheathing paper having been stapled to the wall sheathing during framing.Sheathing paper maybe eliminated in the case where low permeance foam sheathings are used

ROOF FRAMING

Learning Objective:

To understand why roof trusses are used in wood frame construction

Factory fabricated roof trusses are widely used in Canada for the following reasons

- Factory made roof trusses are more economical than site built hand framed roofs
- Trusses are light weight and easy to handle
- Software and computer aided design has made it possible for roof truss manufacturers to provide trusses for almost any roof no matter how complicated, quickly and efficiently
- Factory made trusses are built to stringent quality control standards ensuring that the correct lumber is used, that nailer plates are located at the joints correctly and installed under enough pressure to ensue connections meet loading requirements.

Factory built trusses are recognized by national and provincial building codes.

ATTIC AND FLAT CEILING

Learning Objective:

To understand roof framing in wood frame construction

Typical roof framing using trusses to form an attic and flat ceiling, note that the heel of the truss is raised to allow for full depth insulation at the exterior wall.Typical roof truss with raised heel to allow full depth insulation at the exterior wall.

WIDE RANGE OF CEILING FORMS

Learning Objective:

To understand that a wide range of ceiling forms can be accommodated by roof trusses.

Roof trusses that provide for a sloped interior ceiling and that will also accommodate large amounts of insulation. Would there be an interest in the local market for high sloped interior ceilings?
Roof trusses are very versatile and can accommodate a wide range of ceiling and roof forms.

COMMON ROOFING ASSEMBLIES

Learning Objective:

To understand common roofing assemblies used in wood frame construction

The most common roofing used is mineral surfaced asphalt shingles. These shingles are available in a wide range of textures and colours. The shingles are installed with a 300mm (12”) wide starter strip of rolled roofing at the lowest part of the roof to protect from the effects of ice damming. Shingles typically lap 50mm (2”). Sheet metal flashings are typically used in valleys and where roofs butt into walls. Asphalt shingle roofs typically last 15 to 20 years depending on the grade of single used, quality of installation and local climate.

Asphalt shingles are the most common roofing product used, these are available in a wide range of colours and textures and a 15 to 20 year life can be expected from this type of roof.

ATTIC INSULATION

Learning Objective:

To understand attic insulation methods used in wood frame construction

Attic insulation protects the home from heat losses in the winter and excessive heat gains in the summer. A range of blown and batt insulation systems can be use for insulating attics these include:

- Fiberglass batt insulation
- Mineral wool batt insulation
- Blown chopped fiber glass
- Blown mineral wool
- Blown cellulose fiber treated with borate fire retardant

As in the case with wall insulation it is necessary to get complete coverage and filling of all cavities to ensure the best performance from the insulation. At the same time at the edge of the attic where venting occurs space must be maintained to allow for outdoor air circulation

WINDOWS

Learning Objective:

To understand the types of windows used in wood frame construction

Windows come in a wide range of styles and the frames are made from a wide range of materials. The minimum glazing unit used in windows in Canada is a double glazed window with a 12mm (1/2”) air space usually using a metal spacer bar containing a desiccant to absorb moisture. In colder climates Low E coatings are used to reduce radiant heat losses and Argon gas maybe used to reduce conduction and insulated spacers are used to reduce conductive losses. In the coldest climates triple glazing using an additional layer of glass or a plastic film will be used. The window frame materials used in Canada include:

- Extruded vinyl frames which are widely used because of their appearance, energy efficiency and cost. For larger windows steel reinforcing is sometimes required which will increase heat conduction through the frame.
- Thermally broken aluminum frames, thermal conductivity through the frame is reduced by replacing a section of the frame with a piece of plastic, aluminum windows are known for their low exterior maintenance.
- Wood window frames are energy efficient and are often chosen for their aesthetic appeal. To reduce maintenance on the exterior of wood windows maybe metal clad or vinyl clad
- Fiberglass window frames particularly when filled with foam are very energy efficient, the fiberglass also expands and contracts at a rate similar to glass which reduces the stress on seals potentially leading to a longer life.

Opening windows can be classed as hinged or casement type and sliding type. As a general rule casement type windows will be able to obtain and maintain a better air seal than sliding type windows.

HIGH PERFORMANCE WINDOWS

Learning Objective:

To understand the characteristics of energy efficient windows

Windows used in housing tend to be energy efficient for reasons of comfort, energy use and to prevent condensation forming on the interior surfaces. The glazing units at a minimum will be double glazed with a 12mm (1/2") air space. To enhance the efficiency of the glazing units some or all of the following technologies will be used.

- Low E coatings which reduce radiant heat losses
- Argon or Krypton gas fill
- Low conduction foam rubber or fiberglass spaces
- Additional glazings in the form of glass or plastic films with and without low E coatings
- For opening windows casement or hinged windows with compressible weather stripping will be the most airtight reducing heat losses by air leakage
- For west exposures or in cooling climates solar rejection Low E coatings are used

Window installation is also critical for good energy performance. The window frame must be air sealed around it's entire perimeter to the building's air barrier.

DETAILING - WOOD FRAME

Learning Objective:

To help understand a complete wood frame assembly

Corner section of a house constructed with wood frame housing construction methods

- The base represents a poured in place concrete foundation with exterior extruded polystyrene foam insulation
- A 38 x 89 mm (2x4) sill plate rests on the foundation on a foam strip sill gasket
- Open web floor joists are placed on the sill plate and support plywood or OSB floor sheathing
- The wall framing consists of 38mm x 89mm (2x4) studs at 400mm (16") on centre with plywood or OSB sheathing
- The wall cavities are filled with fiberglass batt insulation and 150 micrometer (6 mil) polyethylene air vapour barrier is applied over the inside face of the studs and the insulation
- The interior wall finish is 12mm (1/2") thick gypsum wall board with all joints taped and covered with joint compound and sanded smooth, the drywall is then painted with a latex primer and paint.
- The flooring is either solid hardwood typically maple or birch or a composite floor consisting of plywood or MDF with a hardwood veneer
- The wall and window trim are made from finger jointed pine or other softwood painted with an oil or water based enamel

WOOD FRAME ASSEMBLY

Learning Objective:

To help understand a complete wood frame assembly

Exterior view of the building assembly

The outside of the foam insulation that covers the foundation is covered with a fiberglass reinforced acrylic stucco

- The exterior wall sheathing is covered with foam plastic rigid insulation and 19mm (3/4") thick vertical strapping to form a drainage plane
- The exterior cladding consists of horizontal wood siding and 19mm x 89mm (1x4) and 19mm x 140 mm(1x6) wood trim

WOOD FRAME ROOF ASSEMBLY

Learning Objective:

To help understand a wood frame roof assembly using factory built trusses

Illustrate the construction of a roof assembly using factory produced trusses

- 12mm (1/2”) gypsum board is used as the interior ceiling finish
- Above the gypsum board is a continuous 150 micrometer (6 mil) polyethylene air vapour barrier
- Fiberglass batt insulation is shown between the bottom cords of the roof truss
- The truss has a raised heel allowing full depth ceiling insulation to be carried out over the exterior wall
- The trusses are sheathed with plywood or OSB sheathing
- A pre-painted metal flashing is used over the fascia board to provide weather protection
- A dark metal flashing carries down from the roof sheathing and over laps the fascia
- A 300mm (12”) strip of roofing felt is laid over the flashing and carries up the roof sheathing
- Asphalt shingles are applied over the top of the roofing felt and the plywood sheathing
- A plastic capped attic power vent is shown towards the top of the roof
- Venting at the eaves is through a perforated aluminum or vinyl soffit

DETAILING – LIGHT STEEL FRAME

Learning Objective:

To help understand a complete light gauge steel frame assembly

Exterior view of the building assembly.

- The outside of the foundation is covered with a fiberglass reinforced acrylic stucco
- The exterior wall is covered with foam plastic rigid insulation and 19mm (3/4”) thick vertical strapping
- The exterior cladding consists of horizontal vinyl siding and vinyl trim

DETAILING – INSULATED CONCRETE FORMS

Learning Objective:

To help understand an insulated concrete (ICF) form assembly

Show an ICF wall and floor assembly

- The base represents a poured in place concrete perimeter foundation with slab on grade. The slab is insulated beneath with extruded polystyrene foam insulation and contains a radiant floor heating system.
- The ICF foam block main floor wall sits on the concrete perimeter foundation. Horizontal and vertical reinforcing steel is placed in the forms and the concrete is poured.
- Wiring chases are channeled in the inside face of the ICF foam and openings are routed out for the electrical boxes.
- The interior wall finish is 12mm (1/2”) thick gypsum wall board that is glued to the inside face of the ICF blocks.
- All joints in the drywall are taped and covered with joint compound and sanded smooth, the drywall is then painted with a latex primer and covered with wall paper.
- The flooring is ceramic tile set in mortar on the concrete slab to ensure good conduction of the heat to the living space
- The wall and window trim are made from finger jointed pine or other softwood painted with an oil or water based enamel

INSULATED CONCRETE FORMS - EXTERIOR WALLS

Learning Objective:

To help understand an insulated concrete (ICF) form assembly

Exterior view of the building assembly:

The outside of the foundation is covered with a fiberglass reinforced acrylic stucco

- The exterior wall is covered with 19mm (3/4") thick vertical strapping which in turn supports a heavy asphalt impregnated cardboard and stucco mesh
- A scratch coat and final coat of stucco are applied over the metal mesh and the last coat of stucco is painted

Benefits of this type of assembly – reduced thermal bridging, rain screen assembly

SERVICES IN WALL

Learning Objective:

To understand how electrical services are run in walls

One of the advantages of wood frame construction is the ease with which services can be installed. All services are installed before the cavities are insulated.

- Electrical wiring must be set back 2" from the inside face of the wall to protect it from drywall nails or screws. Wiring can be run vertically in the open wall cavities as long as it is stapled to the side of a stud, wiring is run horizontally by drilling through the studs. Electrical boxes are either metal or plastic and are nailed or screwed to the sides of the stud.
- Plumbing lines and stacks are also routed through stud cavities

SERVICES IN FLOOR

Learning Objective:

To understand how electrical, plumbing and mechanical services are run in floors

Similar to walls plumbing, wiring and HVAC systems can be run in floor joist cavities.

- Plumbing and wiring can in many cases can be run perpendicular to the joist direction by drilling through the joist.
- For ductwork and in some cases of plumbing where they run perpendicular to the joists a ceiling drop is required.
- Wood I joists and open web joist have enough depth to allow all services to run perpendicular to the direction of the joists.

BUILDING'S MECHANICAL SYSTEMS

Learning Objective:

To introduce mechanical systems

Summarize the functions of a heating ventilation and air conditioning system (HVAC)

- To provide heating and cooling and where needed mechanical dehumidification
- To provide adequate distributed ventilation to vent internally generated moisture and other air pollutants and introduce enough outdoor air to maintain acceptable indoor air quality
- Must not depressurize the building more than 5 Pa as this will cause flue gas spillage (back drafting) from naturally aspirated combustion appliances. A home under a negative pressure, if ground connected, (slab on grade, basement or conditioned crawlspace) can draw soil gases such as methane, water vapour and radon into the indoor air. In hot humid climates depressurizing a home can lead to warm moist outdoor air being drawn into insulated cavities and interior partition walls where condensation can form.
- Must not pressurize the building as this can lead to moisture accumulation in insulated cavities in cold climates by forcing warm moist air into those cavities

MECHANICAL SYSTEMS

Learning Objective:

To acquaint the audience with central forced air systems

The most common heating system is the central forced air heating system consisting of central furnace, supply and return ductwork and controls. Air is drawn from a few locations in the home through return air grills and into the return air plenum where it passes through filters and then into the furnace where it is heated, if heat is being called for. The heated air is them distributed around the house. The operation of the furnace is controlled by a central wall mounted thermostat. In many cases the furnace fan will operate continuously to filter the house air and provide ventilation air distribution. Furnaces use natural gas or electricity or oil depending on local availability. Forced warm air heating systems are popular because of their cost, quick response time, their ability to provide filtered air and distribute ventilation. Forced air heating systems require the skills of a sheet metal mechanic which in residential construction are not always available outside North America.

RADIANT FLOOR HEATING

Learning Objective:

To understand the use of radiant floor heating in residential construction

Radiant floor heating in which the floor is heated and then serves as a large radiant heat source has proven to be popular. There are a number of different types of radiant floor heating systems and way in which radiant heating is installed.

- Hydronic radiant floor heating systems utilize a fossil fuel fired, electric boiler or ground source heat pump to heat water that is then circulated through a network of plastic pipes that are buried in concrete floor slabs. The concrete floor slabs must be insulated from beneath to ensure the majority of the heat leaves the slab from the top surface. The concrete floor slabs can be placed on the ground or maybe poured on a wood frame subfloor. Some hydronic systems do not use a concrete slab and the water piping is simply strapped directly to the underside of the plywood or OSB subflooring, batt insulation is placed in the floor joist cavity beneath the piping.
- Electric cable radiant floor heating system, in this system metal cables are cast into the concrete slab and when an electric current is passed through the cables heat is generated which in turn heats the floor slab
- Electric floor mat heating, in this case a mat that contains electric heating elements is placed on and adhered to the wood based subfloor with thin set mortar, a second layer of thin set mortar is then placed on the floor mat and ceramic tiles are sent into the thin set. This type of application is commonly used to heat bathrooms and kitchens with another type of heating system used for heating the rest of the house.
- In some cases hydronic radiant floor heating is combined with forced air heating using the same boiler as the heat source. The house air is heated through a heat exchanger located in an air handler that uses hot water taken from the boiler. The hydronic radiant heating portion of the system is used in the bathrooms and kitchens and the forced air heating being used for the rest of the house.

VENTILATION

Learning Objective:

To introduce the concept of whole house mechanical ventilation

Due to the increasing levels of airtightness, the building code has recognized the need for providing mechanical ventilation and it is now required in some form in all new Canadian houses. The most effective ventilation systems are those that both supply fresh air and exhaust stale air.

HEAT RECOVERY VENTILATOR (HRV)

Learning Objective:

To introduce central HRV systems

The ideal mechanical ventilation system is one that does not place the house under a negative or positive pressure and that also minimizes the heat losses associated with ventilation. To meet these requirements central heat recovery ventilators (HRV's) were developed. These units contain a supply fan and an exhaust fan and a heat recovery core. Moist stale air is continuously exhausted from the kitchen, laundry and bathrooms and filtered outdoor air is continuously supplied to the bedrooms, living room, dining area and any other habitable rooms. As the air streams pass by each other heat is transferred preheating the incoming air. In addition by having a fan forced supply the incoming outdoor air can be filtered. The supply air can be distributed through a dedicate system of ducts or maybe ducted in a forced air heating system return air plenum for distribution through heating ducts. This approach requires that the furnace fan runs continuously which will be more costly in electricity. HRV's should always be locate inside the heated envelope of the building where they can be easily accessed to allow for maintenance and so that filters ca be readily changed and cleaned.

VENTILATION: HEAT RECOVERY

Learning Objective:

To understand how an HRV core works

Heat is transferred in an HRV core through metal or plastic plates that separate the supply and exhaust air streams. HRV's typically recover 60 to 70% of the heat from the exhaust air stream. As the warm moist indoor air is cooled condensation is formed inside the core which has to be drained. If the outdoor air is below freezing then ice may form in the core blocking it, to deal with this HRV's sold in colder climates have defrost cycle that melts the iced periodically.

ENERGY RECOVERY VENTILATOR (ERV)

Learning Objective:

To introduce the concept of the energy recovery ventilator (ERV)

The ERV functions in a similar way to the HRV in that it continuously supplies and exhausts air to and from the home. The difference is that the ERV both exchanges moisture and heat between the exhaust and supply air streams. By doing this the ERV can both preheat and humidify the incoming air in the winter and if the home is air conditioned it can pre-cool and dehumidify the incoming air in the summer. There are both rotary wheel and fixed core cross flow ERV technologies in use. The rotary wheel is about 70 to 80% efficient and the fixed core type is about 50 to 60% efficient. ERV's do not require drains like HRV's because a portion of the moisture is transferred to the other air stream.

INTEGRATED MECHANICAL SYSTEMS

Learning Objective:

To introduce the audience to the concept of integrated mechanical systems

Integrated mechanical systems (IMS) are HVAC systems that integrate two or more functions into one piece of equipment. The example on the slide illustrates one type of IMS. A high efficiency gas water heater is used to supply domestic hot water for bathing and washing, hot water for a hydronic heating system and through a fan coil unit provide hot air for space heating. This approach has the potential for reducing costs because it only requires one high efficiency combustion appliance to serve several functions at the same time.

INTERIOR FINISHING

Learning Objective:

To acquaint with finishing practices in wood frame housing

The most common interior finish used in Canadian housing is gypsum board. This is because of the low cost of the material, it's fire resistance and the ability to produce a smooth finished surface. The joints in the gypsum board are covered and filled with paper tape and a filler compound. Holes in the gypsum board are filled with the same filler material. In each case several layers of filler is applied and sanded between coats. The final smooth wall surface is painted with a primer / sealer and then typically covered with a latex paint.

WOOD TRIM

Learning Objective:

To acquaint the audience with finishing practices in wood frame housing

Wood trim used in housing includes MDF finger jointed pine or fir. The trim material is typically painted with a latex or oil based enamel for long term durability.

INTERIOR FINISHING - HEALTHY MATERIALS

Learning Objective:

To acquaint the audience with the concept of healthy building materials

Chemical off gassing from interior finishes such as particle boards, paints, sealants and lacquers can cause illness and allergic reactions for some individuals. By selecting materials that have no or low chemical off gassing characteristics or by sealing the surfaces of materials that do off gas the indoor air quality of a home can be improved significantly. Generally speaking building materials such as stone, glass, ceramic tile etc. are inert and do not off gas chemicals. Listed below are a few ways to deal with chemical off gassing

- Do not use any particle board or plywood that uses urea formaldehyde based glues, if these products cannot be avoided seal the exposed edges and surfaces with a water proof sealer
- Use plywood and fiberboard materials that use exterior grade phenol formaldehyde glues or use MDF that uses urethane based glues
- Try to use water based finishes, sealants and glues rather than solvent based materials where possible
- Use ceramic tile instead of vinyl flooring
- Use wood flooring that has been pre-finished at the factory

Specialty suppliers produce paints, sealants and glues etc. that have very low toxicities

For individuals that are chemically hypersensitive their physician and an expert consultant should be consulted when selecting construction materials, interior finishes and mechanical systems

INTERIOR FINISHING – HEALTHY MATERIALS

Learning Objective:

To acquaint the audience with some healthy building materials

- Plywood that use exterior grade phenol formaldehyde glues or use MDF that uses urethane based glues
- Low VOC (volatile organic compound) latex paints reduce off gassing of VOC's, these generally can only be obtained in light coloured tints
- Silicone sealant when initially curing off gasses acetic acid but once cured it is largely inert
- Solid hardwood and hardwood veneer floorings are available pre-finished, this will minimize off gassing after installation.
- Specialty suppliers produce paints, sealers, sealants, glues etc. that have very low toxicities these are usually tailored for use by chemically hypersensitive individuals

SUMMARY

Learning Objective:

Wood frame houses follow a straight forward progression from foundations to finished interiors. The frame structure can be closed and weather tight in a matter of days following the completion of the foundation (depending on size of home, complexity, size of crew)

The services for wiring, plumbing and heat are often incorporated into the house framing. Houses are heated, cooled and ventilated with central systems, typically based on the installation of metal duct work

Finishes are dictated by local tastes and houses are usually sold completely finished except for the basement.

Houses are completes with kitchen, bathrooms and landscaping