

## **EXAMPLES OF RESIDENTIAL BUILDING METHODS AND BASIC CONSTRUCTION CODES**

These examples are a general outline for residential construction. Refer to your 2009 Michigan Residential Code Book and other resources for actual methods and code specifications, as they apply to your specific project.

### **BUILDING FRAMING**

#### **WALL /FLOOR FRAMING**

Treated wood framing on exterior walls closer than 6" from exposed earth

Treated wood on girders closer than 12" to ground

Treated wood on joists closer than 18" to ground

Treated wood on sills or sleepers on a concrete slab that is in direct contact with the ground

Beam construction & span between support posts

Allowable spans for joist cantilevers

Allowable joist spans

Allowable joist notching – not more than 1/6 of joist depth, not longer than 1/3 joist depth, more than 1/3 joist depth

Floor sheathing

Correct fastening of structural sheathing & wall plates

Stud grade spacing

Double top plates

Single top plates – 3x6 steel plate with six 8d nails per side at joints, corners & intersecting walls; with rafters & joists centered over studs with a tolerance of 1" maximum

Stud notching not exceeding 25% of its width for bearing walls and 40% in non-bearing walls

Stud drilling no more than 60% of stud width, with edge no closer than 5/8" to stud edge; Studs in exterior walls drilled over 40% up to 60% shall be doubled with no more than two successive studs willed; otherwise, rated mechanical structural repair bracket(s) must be installed

Corner (T) bracing at corners & every 25' of wall or structural (OSB) sheathing

Maximum spans for headers

Maximum spans for garage door headers

Required number of jack-studs, typically double for openings over 60"

Framing around chimneys – 2" clearance from front & sides and 4" from back to combustible materials

Habitable rooms, hallways, bathrooms, kitchens – minimum ceiling height is 7'

Loft area rooms min. side wall height 60"

Passageways – minimum clear width of 36"

Egress windows: minimum 5.7 sq.ft. opening, minimum 24" net clear height, minimum 20" net clear

Windows over 72" above finished grade – the lowest part of the clear opening must be 24" above the finished floor

Exit door – minimum size 3'0" x 6'8" side hinged door (cannot exit through a garage)

Required siding, soffit, fascia

Required site address plainly visible from the road

Correct fasteners

Rafter/truss bearing – 1 1/2" on wood, 3" on masonry or approved joist hangers

Truss installation – manufacturer's truss drawings must be submitted or available on site

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### **ROOF FRAMING**

Roof assemblies shall have roof rafters or trusses attached to their supporting wall assemblies by connections capable of providing resistance required in Table R802.11, or per manufacturer requirements; minimum connection rating must be 175 lbs

Truss bottom cord bracing every 10'

Permanent diagonal truss bracing – in gable ends & every 20'

Allowable spans for rafters

Roof sheathing – spans & clips

Felt underlayment for shingles

Ice shields required that extend 24" inside exterior wall line of building

Flashing required: wall & roof intersections, chimneys, vents, change of slope or direction

Re-roof: remove existing when 2 layers already exist

Roof space ventilation

Access to attics: minimum size 22" x 30", minimum 30" headroom required over access

### **FIRE SEPARATION & STOPS**

One hour rating for exterior walls less than 5' from the property line/building (rated both sides of wall)

No openings in exterior walls less than 3' from the property line/building

Garage dwelling separation: ½" gypsum on the garage side; if habitable living above, then 5/8" type X gypsum on the ceiling and ½" all walls

1 3/8" minimum solid wood door, 20 minute fire rated door, or 1/3/8" steel door separating

Garage floor – an approved non-combustible material with floor slope to overhead door or floor drain

Concealed wall spaces at the ceiling & floor level and at 10' intervals

Connection between horizontal & vertical spaces (for example: soffits, dropped ceilings)

Ceilings & floor openings (vents, pipes, wiring holes, ducts, chimneys, fireplaces)

Enclosed areas under stair space must be entirely covered with 1/2" minimum gypsum

### **SMOKE DETECTORS**

Basement & one per floor above basement level

One in each bedroom

Outside each separate sleeping area in the immediate vicinity of bedrooms

Additions, alterations & repairs to existing dwellings constructed prior to 11/6/74 shall result in installation of smoke detectors for the entire dwelling as required for new dwellings; exception is permitted for the usage of 5-year battery-operated smoke detectors where wiring is technically infeasible in existing areas

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### **SAFETY GLAZING**

Glazing adjacent to doors within a 24" arc of the door in a closed position whose bottom edge is less than 60" above the floor

Glazing in walls enclosing bathtubs, showers, whirlpools, etc. where bottom edge of glazing is less than 60" above a standing or walking surface

Glazing in fixed panels in excess of 9 sq.ft., with the bottom edge less than 18" above the floor, top edge greater than 36" above the floor, walking surface within 36" (all conditions must be met)

Glazing within, or adjacent to, stairways within 60" horizontally of the bottom tread in any direction when the exposed surface of the glass is less than 60" above the tread nose of floor

### **Stairs, Landings**

Door swing cannot be over steps and where doors open onto ramp or at change in direction

Landing minimum size 36" wide x 36" long, with maximum of 7" from top of landing to top of threshold.

Stairway minimum width = 36"

Winder stairs: width of treads at a point not more than 12" from the side where the treads are narrower must be 10" minimum & minimum width of any tread must not be less than 6"

Spiral stairs: minimum width of 26" with each tread having a 7 1/2" minimum tread width at 12" from the narrow edge

Stairway illumination required, switches at top & bottom of stairway

Minimum 36" height guardrails for balconies, open sides of stairs or raised floor surfaces more than 30" above the floor

Tread & bottom rail of the guard – 4 3/8" for guards on the sides of stair treads

Maximum openings of 4" on stair backers for any steps over 30" above floor or grade below

Handrails required for four or more risers

Handrail height – 34" minimum, 38" maximum

Handrails must be a graspable style 2 1/4" dia. and run continuous from the bottom step nose to top step nose.

### **MICHIGAN UNIFORM ENERGY CODE 2003 (Effective 10/24/2008)**

Exterior wall assemblies R-21

Exterior window and door openings-fenestration openings  $U=0.35$  ( $R=2.85$ )

Attic ceiling assemblies R-49, note: vaulted or cathedral ceilings may be R-38

Floors over unconditioned basements or crawl spaces R-21

Exterior basement walls with conditioned interior space R-10

Exterior crawl space walls with conditioned interior space R-10

Monolithic concrete foundation (heated dwelling), R-10 rigid foam insulation top of slab to 4' below grade.

\*Insulation installed to the interior of basement and crawl space walls must meet Fire Code requirements to be exposed.

Note: An acceptable alternative is to providing the building department with a prescriptive performance RESCHECK document showing positive compliance with the 2009 International Energy Code.