

# BUILDING DEPARTMENT

## HARVARD RESIDENTIAL INSPECTION CHECKLIST

*Inspection Line: 815.943.6468*

Residential dwelling and residential accessory structure building projects are required to be inspected at various stages of construction. The following is a list of the inspections in the general order that they occur, and some of the items the inspectors look for and most often find not properly done. Refer to the 2012 International Residential Code for additional requirements.

**An Approved Set of Plans and Permit Card shall be on site for every inspection (R105.7, 106.3.1, 319.1). Address must be properly posted.**

- Conformance with Code and the approved plans is the intent of all inspections. Where plans are more stringent than Code, work must conform to the approved plans (R106.4) and vice versa; unless otherwise previously approved.
- The inspector must be able to safely access the work to be inspected. Where needed to allow visual access, contractor shall provide a safe ladder or other standard means of access (OSHA 3252-05N).

### 1. FOOTING

- prior to concrete pour (R109.1.1)
- trenches excavated to proper depth - on undisturbed ground or engineered fill and typically 24" below final grade (R403.1, R403.1.4.1)
- continuous forms level, of proper dimension and depth, sufficiently secured to resist the weight of the concrete (R403.1.1, 403.1.5)
- bottom of the footing free from loose dirt, rocks, debris, and organics (ACI 318)
- rebar at least 3" above the soil and 1.5" from forms; lap splices per Code (typically 2') (ACI 318)
- rebar firmly anchored to the forms so it will not shift when the concrete is poured (ACI 318)
- vertical reinforcement bars cut and bent and secured in the footing at the time of the inspection (ACI 318, R404.1.2.3.7.4)
- grounding rod in place (concrete encased) - #4 or alternate (E3608.1.2)

### 2. INTERIOR STRUCTURAL PADS

- prior to concrete pour (R109.1.1)
- pads formed level, to proper size and depth, on undisturbed ground or engineered fill (R403.1, 403.1.1, 403.1.5)
- bottom of pads free from loose dirt, rocks, debris, and organics (ACI 318)
- steel reinforcement cut and in place, secured to ensure at least 3" above soil and 1.5" from form boards (ACI 318)
- placement of pads in relationship to weight bearing points for structure, as per approved building plans, are the responsibility of the contractor (R105.8)

### 3. FOUNDATION WALL

- prior to concrete pour or CMU grouting (R109.1.1)
- minimum 10" x ½" anchor bolts on site (or larger as prescribed by approved plans) (R403.1.6)
- forms in place, complete, and level, including bulkheads and block outs (R404.1.2.3.6)
- lintels blocked out and reinforced per plans
- rebar cut, bent, and secured (R404.1.2.3.7.4, ACI 318)
- rebar secured to ensure minimum 1.5" from forms, placed per plans (R404.1.2.3.7.4)
- shear wall hold downs per plan, secured (R106.4, 602.10)
- grounding rod in place (concrete encased) - #4 or alternate (E3608)
- for CMU, multiple inspections may be required (bond beams, lintels, etc.); speak with inspector about job specifics prior to beginning work (R109.1.5)

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### 4. BELOW SLAB

- prior to concrete pour (R109.1.1)
- below slab plumbing has been inspected and approved by the State (R109.1.5)
- expansion joint and grade line marked at edges; grade stakes in the field to establish depth of the pour in place (R503.1)
- penetrations wrapped
- positive connection of steel columns to structural pads
- floor slopes to drain towards vehicle door (R309.1)
- slab area to be free from organics, debris, and rocks (R506.2, 506.2.1)
- vapor retarder installed (R506.2.3)
- slab reinforcement in place and secured if required (R506.2.4)
- adequate compaction of the soil to support the slab (R506.2.1)
- in-floor radiant heat tubing to pressure (minimum 100 psf for 30 minutes) (M2103.4)

### 5. DECK FOOTING/CAISSONS

- excavations are complete and of proper dimension and depth (R404.1.7)
- forms are in place (sonotube or standard forms, per plan) (R404.1.2.3.6)
- rebar is cut, bent, and secured (R404.1.2.3.7.4)
- post centered on caisson, post base on site (if to be wet set) (R106.4)

### 6. DAMPPROOF/DRAIN:

- required if there is usable space below grade inc. garage, w/o basement, etc. (R406.2)
- do not backfill; call in advance if you have questions about this inspection (R404.1.7)
- perimeter drains of proper drain pipe installed at proper depth where required (R405)
- window well drainage tied into perimeter drain or to gravel backfill per plans (R310.2.2)
- foundation sealer spread to appropriate thickness (R406)
- wood foundation per engineered plans, including caulked seams and fasteners (R406.3.1)

### 7. MIDROOF – not required for metal roof panels; no shingles installed

- shingles on site; must meet ASTM D 3161 Class F; attachment for 110 mph
- ice & water shield – extend at least 24” within perimeter wall (R905.2.7.1)
- underlayment (R905.2.3, 905.2.7)
- shingle fastening per manufacturer’s schedule for appropriate wind speed (R905.2.4.1, 905.2.6)

### 8. FRAME/MECHANICAL

- sheathing/truss inspection optional, upon completion of structural framing and sheathing
- rough plumbing signed off by State (R109.1.2)
- rough electrical signed off by State (R109.1.2)

#### Floor Framing

- fasteners and connections per Tables R505.3(1), R602.3(1) and plans
- floor joists within 18” & beams within 12” of soil; exterior & interior sill plates in contact with concrete treated (R317)
- floor/ girder spans per plans (R502.5)
- load bearing lumber, beams, girders, Glu-lam beams, logs identified with grade mark or inspection agency (R502)
- post size & beam connection – top and bottom; supported & strapped (R502.9)
- fastening of framing members (R602.3(1))
- beam, girders & joist bearing min 1-1/2” at wood framing; 3” min at masonry; or approved metal hanger (R502.6)

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### Floor Framing (cont'd)

- notching and drilling per IRC & mfr specs (R502.8)
- web stiffeners/ bracing per truss calcs (R502.11.2)
- joist lateral support with 2x solid blocking, bands or rim joists (R502.7)
- floor openings framed per plans (R502.10)
- 2nd floor bearing walls perpendicular to floor joists not offset greater than depth of joists (R502.4)
- floor joist under & parallel with 2nd floor bearing walls doubled (R502.4)
- floor decking glued & nailed per plans (Table R602.3(1))
- stair stringers sized & installed per details
- stair risers max. 7-3/4" (R311.7.5.1); treads min 10" (R311.7.5.2)
- door landing depth equal to width of stairs, min 36" (R311.7.6)
- min. 6' 8" headroom above stairs (R311.7.2)
- all miscellaneous nailing per Tables R602.3(1), R602.3(2)
- fire-blocking – vertical and horizontal (R302.11)
- holes with annular spaces exceeding 1/2" shall be sealed (R302.11)
- winders and spiral stairs per R311.7

### Wall Framing

- framing members fastened per Tables 602.3(1), 602.3(2), 602.3(3)
- wood wall studs grade & size per plans (R106.4, R602.2, R602.3)
- size, height spacing of wood walls studs (R602.3.1; Table R602.3(5))
- interior wood wall studs (R602.4 & R602.5)
- exterior walls & interior bearing walls have double top plate; offset 24" min (R602.3.2)
- maximum anchor bolt spacing 6' O.C.; min (2) per sill plate within 12" & not more than (7) bolt diameters from plate ends (R403.1.6)
- structure walls sheathed entirely with minimum 7/16" oriented strand board (OSB) or plywood; or as otherwise noted on the plans; fastening, orientation, nailing pattern (R106.4, Tables R602.3(1) and (2), R604.3)
- no excessive holes or notching in studs (R602.6)
- header/ beam sizes per plan (R106.4, 602.7)
- interior non-bearing walls studs max 24" O.C. (R602.5)
- fire-blocking – horizontal and vertical - at chases, soffits, framed pop-outs, top plate openings, etc. (R302.11)
- bedroom emergency egress windows per R310; 5.7 sf net clear opening; min. 20" wide, 24" high open area; sill height max. 44"
- min. 36" hallway width (R311.6)
- min. 7' 0" ceiling height in habitable rooms (R305.1)
- notching/ boring of top plates in excess of 50% requires 16 gauge metal tie 1.5" wide with 8-10d nails on each side or covered with wood structural panel sheathing (R602.6.1)
- sill plates & 1" offset at column framing contact with concrete (R317.1, R317.1.4 Exception 1)
- braced wall panel uplift load path (R602.3.5)
- crawl space venting – 1sf for every 150 sf; vents within 3' of each corner (R408.1)

### Prefabricated Joists & Trusses

- stamped truss design & layout plan on job site (R802.10.1, 502.11.4)
- design loads per plans & truss calcs (R106.4, 502.11.4, 802.10.1)
- plate connectors match truss calcs (R502.11.4, 802.10.1)
- lumber size, species & grade marks match truss calcs for each member (R502.11.4, 802.10.1)
- girder truss plies & fastening matches truss calcs and plans (R502.11.4, 802.10.1)
- correct hangers, uplift devices, bearing locations & widths per plans and truss calcs & design (R502.6, 502.11.4, 802.10.1, 802.11.1.2)

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### Joists & Trusses (cont'd)

- no cuts, notches, bored holes or spliced trusses without engineer's approval (R502.8.2, 502.11.3, 802.7.2, 802.10.4)
- lateral web bracing installed per truss calcs & plans (R502.11.2, 802.10.3)
- gable end truss bracing & connection to exterior wall per plan details (R106.4, 802.10.3)
- roof ventilation per plans and Code (R106.4, 806)

### Roof/Ceiling Framing

- ceiling joist size, species & grade per plan (R106.4, 802.4; Table R802.4(1&2))
- roof rafters size, species & grade per plan (R106.4, 802.5; Table R802.4(1-8))
- 1-1/2" min bearing at joists & rafters (R802.6)
- solid sawn wood & Glu-lam beams & headers sized per plan (R106.4, 602.1.1, 602.1.2)
- joists & rafters fastened to top of wall per Table R602.3(1)
- roof sheathing properly rated, spaced & oriented (R106.4, 803.2)
- roof sheathed per plans – material type and thickness, orientation, nailing pattern, joint spacing (R106.4, 803.2, Tables R503.2.1.1(1), R602.3 (1) and (2))
- sheathing material & span index per plans (R106.4, 803.2.2)
- sheathing fastened per plans (R106.4; Tables 602.3(1), 602.3(2), 602.3(3))
- OSB joints space 1/8" or per mfr specs (APA E30)
- panel joints staggered R803.2.3 or APA30
- roof ventilation installed per plans
- insulation baffles installed at eave vents (R806.3)
- over-framed conventional rafters, ridge beam & king posts installed per plan details
- lower roof sheathing continuous under all over-framing
- min 22" x 30" finished attic access where attic height is greater than 30" or area greater than 30 sf (R807.1)

### Mechanical

- attic furnaces supported by truss top chords & installed per mfr. installation instructions (R106.1.2)
- fuel gas appliances listed for elevation; combustion analysis report per mfr. required at final
- min. 22" x 30" finished attic access within 20' of equipment location (M 1305.1.3)
- min. 24" walkway from access opening to equipment; 20' max distance; all edges blocked & nailed (M1305.1.3)
- min. 30" wide work platform full length in front of equipment access; min. 30' head clearance; edges blocked & nailed; no obstructions (M1305.1.3)
- upper & lower combustion air vents required when gas appliances installed in confined space (M1701 & G2407)
- attic equipment & "B" vents installed per mfr. installation instructions with 1" min clearance to combustibles (R106.1.2 & M1306.2)
- gravity "B" vents offset max 60 degrees from vertical (shall be considered horizontal if greater than 45 degrees) (G2427.6.8.2)
- "B" vent max horizontal length 75% of vertical length (G2427.6.8.2)
- "B" vents terminate 8' horizontal from vertical side wall & min 12" above roof if less than 12" dia. (Figure G2427.6.3)
- single wall "B" vents attached with sheet metal screws to appliance collar and joints (G2427.10.6 (1))
- primary furnace condensate disposal; slopes 1/8" per foot; supported 48" O.C. max & terminates in readily accessible location (M1411.3)
- attic furnaces/ air handlers shall have a drain pan installed with slope to secondary drain outlet or water level detection/ equipment shut-off device (M1411.3.1)
- secondary condensate line sloped 1/8" per foot & terminates in a conspicuous location (M1411.3.1)
- A/C refrigerant lines insulated to R-2 M1411.5 & IECC 403.3

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### Mechanical (cont'd)

- HVAC supply & return ducts sized per plans & installed per mfr. specs (M1601 & M1602)
- sealed return air
- combustion air to wood stoves and other appliances as applicable
- metal HVAC duct insulated to R-8 in unconditioned attic space (M1601.4.5)
- max. 1/2" per foot sag in flex duct supported at 4' O.C. per mfr specs, SMACNA or M1601.4
- HVAC flex supply & return duct connections to rigid collars have band connectors, sealed & properly taped (M1601.3, M1601.4)
- metal HVAC duct supported 10' O.C. with 18 gauge 1/2" wide straps, installed per mfr. specs (M1601.4.3)
- (1) thermostat for each separate HVAC system IECC403.1

### Miscellaneous

- load-bearing lumber, beams, girders, logs identified with grade mark or inspection agency (R502)
- wall framing – lumber dimensions and spacing, king studs and trimmers, door and window headers, shear panel construction
- roll blocking of floor joists and rafters
- fire blocking
- proper notching of beams, joists, and rafters (R502)
- no cuts, notches, bored holes or spliced trusses without engineer's approval (R802.10.4)
- compression (squash) blocking of vertical loads continuous to foundation
- egress windows in place at proper height
- tempered glazing where required, typically identified as such with a stamp on the glazing
- placement of heat runs and cold air returns
- flue pipe, in floor heat, A-vents, B-vents
- combustion air where required.
- dryer vent, typically 4" minimum, hard piped in walls & ceiling

## 9. DRYWALL

- proper placement of drywall and fasteners  
Exception: In Single Family Residential Occupancies, only the 5/8" Type X drywall forming a fire separation will be inspected (garage lid with habitable space above). Required 1/2" Drywall under stairs and at walls separating R and U occupancies will be verified at final inspection.
- note: no green gypsum board allowed on tub and shower walls; cement, fiber cement, or glass-backed gypsum materials only (R702.3.8)

## 10. FINAL

- final plumbing signed off by State
- final electrical signed off by State
- driveway and septic system approved by County
- jobsite clean and free from construction material, trash, and debris
- wall and ceiling coverings
- R-values posted in electrical panel

### Garage

- appliances have vehicle impact protection (bollards or out of path) (M1307.3.1)
- appliances with ignition sources elevated 18" (M1307.3)
- occupancy separation between house and attached garage – 1-3/8" solid core or rated/labeled 20 minutes; weather-stripped gaskets; self-closing and self-latching

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### Attic Area

- finished access opening 22" x 30" at 30+ sf & greater than 30" high (R807)
- light & switch for equipment platform (E3903.4)
- primary & secondary condensate drains installed, tapped & vented per mfr specs (M1411.3)
- furnaces & air-handlers connected to supply circuit disconnect switch within sight or lockout device (E4101.5; Table 4101.5)
- combustion air ducts installed & clear (G2407.11)
- ridge, dormer & soffit vent openings clear & installed per attic ventilation calcs (R806.2)

### Laundry

- operable window or mechanical ventilation required (R303)
- wall switched controlled lighting outlet required (E3903.2)
- dryer vent terminates outside & 3" from openings (M1502.3)
- floor drains to maintain a liquid seal or trap primer (P3201.2)

### Hallways

- 36" minimum clear (R311.6)
- smoke alarm(s) and carbon monoxide detectors required within the immediate vicinity of bedrooms; compliance required for remodels (R314 & R315)
- min. (1) outlet required if greater than 10' in length (E3901.10)
- wall switch controlled lighting outlet required (E3903.3)

### Stairs

- 36" minimum clear (R311.7.1)
- landings 36" min depth x width of stairs (R311.7.6)
- min 10" tread depth; max 7-3/4" rise; +/- 3/8" deviation (R311.7.5)
- 6' 8" min head clearance (R311.7.2)
- handrails required @ four or more risers (R311.7.8)
- handrails 34" – 38" above nose of tread (R311.7.8.1)
- handrails have 1-1/2" clearance to wall (R311.7.8.2)
- handrail 1-1/4" – 2" cross-dimension (R311.7.8.3)
- handrails extend to top & bottom risers with returns to wall or newel post (R311.7.8.2)
- safety glazing within 3' of walking surface or <60" A.F.F. or within 5' horizontally of the bottom tread in any direction & <60" A.F.F. (R308.4.6 & R308.4.7)
- min. 36" high guardrail that does not allow passage of a 4" sphere between openings (R312)
- wall switch controlled lighting outlet required (E3903.3)
- open risers per R311.7.5.1
- opening on sides of stair shall not allow passage of a 4 3/8" sphere (R312.3)
- stairway illumination per R303.7
- winders and spiral stairs per R311.7

### Bedrooms

- egress window min 5.7 sf except 5.0 sf at grade level (R310.1.1)
- min egress opening 24" height; min 20" width (R310.1.2 & R310.1.3)
- window sill height max 44" measured from the finished floor (R310.1)
- min 24" sill height if > 72" above exterior grade (R312.2.1)
- basement window well min 9 sf total area; window wells greater than 44" below grade must have permanent ladder (R310.2)
- bars, grills, covers & screens operable without special tools or knowledge (R310.4)
- natural light 8% floor area (R303.1)
- natural ventilation 4% of floor area or mechanical ventilation (R303.1)

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### Bedrooms (cont'd)

- smoke alarm in each bedroom/ sleeping room; all inter-connected & install per mfr. installation instructions (R314)
- light fixtures installed in clothes closets measured horizontally min 12" or depth of shelf; 6" min if fluorescent (R4003.12)

### Bathrooms

- sink with hot and cold water
- min 50 cfm exhaust fans installed in eater closet rooms & bathrooms or natural ventilation of 1.5 sf min (R303.3 & Table M1507.4)
- water closet 1.6 GPF required (ARS45-312)
- min 30" clear width at water closet (Figure R307.1)
- 15" min from wall to center of water closet (Figure R307.1)
- water closet based sealed to floor
- 21" min clear space at front of water closet (Figure R307.1)
- shower compartment min head height 6' 8" (R305.1(2))
- safety glazing at all windows <60" above floor (R308.4.5)
- safety glazing required at shower doors (R308.4)
- non-absorbent surface at bathtubs & showers min 6' above floor (R307.2)
- max 2.5 GPM shower heads (ARS 45.312)

### Kitchen/Dining

- sink with hot and cold water
- natural light 8% floor area R303.1
- natural ventilation 4% of floor area or mechanical ventilation (R303.1)
- permanent cooking appliances wired, plumbed, vented, installed per mfr specs if present
- fuel gas appliances listed and adjusted for elevation; proper orifices installed

### Other Habitable Rooms

- natural light 8% floor area, natural ventilation 4% of floor area or mechanical ventilation (R303.1)
- min (1) Exit door 36" wide X 6' 8" high & side hinged (R311.2)
- safety glazing at windows (R308.4):
  - manufactures label etched into glazing (R308.1)
  - within 24" of arc of door
  - fixed & sliding panels of door assemblies
  - all glazing < 18" AFF with the top edge > 36" AFF with individual Panes > 9 sf & within 36" of a walking surface
- Fireplace installation complete:
  - factory-built gas fireplaces installed per listing (R1004 & R106.1.2)
  - all gas lines have shut-off valves (G2420)
  - max 6' listed/labeled connector (G2422.1.2.1)
  - installed per mfr installation instructions & masonry per R1001 & R1003

### Exterior

- address numbers plainly visible & legible from front street (R319.1)
- exterior door landings within 1-1/2" of threshold (R311.3.1)
- roofing complete with approved roof covering (R903.1)
- fireplace spark arrester installed, min 2' above any roof within 10' horizontal (R1003.9.2)
- ABS vents extend min 6" above roof (P3103.1)
- "B" vents min 12" above roof; not within 48" of window or other openings; min 8' from vertical wall (G2427.6.3(1) & Figure G2427.6.3)

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### Exterior (cont'd)

- roof vents installed per attic ventilation calcs (R806.2)
- ground mounted HVAC units have 3" high pad (M1403.2)
- all roof flashing installed per (R703.8)
- exterior GFCI receptacles installed (E3902.3)
- exterior light fixtures installed at exit doors & stairs (E3903.3)
- exterior boxes, conduits & fittings listed for wet locations & have W/P covers (E3905.11)
- A/C condensate drains(s) installed to exterior w/90 Degree elbows (M1411.3)
- all hose bibs have vacuum breakers (P2902.4.3)
- grade away from foundation 6" min within 10' (R401.3)

If, during construction, you have any questions or doubts about your project please call **BEFORE** proceeding. 815-943-6468.