

Minimum Design Standards for New Construction, Adaptive Reuse, and Rehabilitation Multifamily Attached Housing Units

**Kentucky Housing Corporation
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KHC Minimum Design Requirements

The following minimum design items are for all newly constructed multifamily attached units. Some standards also apply to rehabilitation and adaptive reuse activities where stated.

KHC’s Minimum Design Standards are used as a guideline to meet and exceed all applicable local, state, and national codes. These standards also serve as vehicle to promote and enforce modern construction and design practices for builders, contractors, and design professionals who wish to utilize funding from the Kentucky Housing Corporation’s Department of Housing, Finance and Construction (HFC). Other methods of construction and design may be acceptable on a case by case basis. If your

design does not satisfy KHC's Minimum Design Standards, please contact the Department of Design and Construction Review for further assistance.

Division I: General Requirements

1) Minimum Design Standards:

- a) Minimum Design Standards shall apply when KHC funding exceeds ten percent (10%) or more of cost per unit to all new construction and reconstruction of multifamily attached homes, all applications involving adaptive reuse converting a former use to residential use and limited rehabilitation projects constructed with funds from the HOME Investment Partnerships Program (HOME), Affordable Housing Trust Fund (AHTF), SMAL, Risk Sharing, Housing Tax Credits and Tax Exempt Bonds. These funds are available through KHC's Department of Housing Finance and Construction (HFC).
- b) **This standard shall apply to the extent covered in the proposed scope of work for all rehabilitation of existing multifamily properties and structures.**

2) **Waiver Process:** Understanding that no single code or standard can cover the infinite number of possible configurations and circumstances that may arise during rehabilitation or construction, a written request for waiver to a KHC requirement will be earnestly considered.

- a) The request must detail the necessity of variance from this code. Photographs are encouraged where necessary to convey understanding.
- b) All requests are to be submitted electronically to the Assistant Director of Design and Construction at KHC and copied to your agency's KHC representative in multi or single family program, respective to the funding being used.

3) **Codes:** All construction shall comply with applicable code and standards listed below:

- a) Kentucky building and residential construction codes
- b) Local planning and zoning requirements
- c) Local authorities' rules and regulations

- d) The Fair Housing Amendment Act of 1988,
 - e) Section 504 of the Rehabilitation Act of 1973
 - f) Americans with Disabilities Act of 1990
- 4) **Soil Treatment-Termite Protection:** A proper and complete termite inspection and appropriate treatment of all property is required.
- a) **The inspection** must be completed by a licensed exterminator who shall report any termite activity located and treatment applied.
 - b) **A warranty** for a period of a minimum of one year on all inspections is required.
- 5) **Radon Reduction:** Passive radon venting is required in all new construction. Rehabilitation projects and adaptive reuse projects where radon levels are known to be at or above four pCi/l (Picocuries per liter of air) shall be retrofitted with a venting system.
- a) A design professional shall design the venting system for all existing structures.
 - b) **The radon vent pipe shall pass through** a heated portion of the structure and an accessible attic space or chase which will allow adequate working space to possibly install an inline fan.
 - c) **Electrical provisions** shall be roughed in, in an accessible attic or chase, for possible future installation of an inline fan.
- 6) **Energy Efficiency:** Documentation and/or calculations that the building envelope exceeds the 2012 IECC requirements must be provided from REScheck or other approved software. REScheck is a US Department of Energy free download at: **<http://www.energycodes.gov/rescheck/>**
- a) **New Construction:** All newly constructed residential building envelope designs shall exceed minimum energy efficiency requirements of the 2012 International Energy Conservation Code (IECC).
 - b) **Adaptive Reuse:** All projects involving any combination of adaptive reuse which requires reclassification of building Use groups as defined by Kentucky Building Code shall exceed the minimum energy efficiency requirements of the 2012 IECC.
 - i) **This section shall apply to the extent not exempted by the Historic Preservation Office of the State of Kentucky.**

c) **Rehabilitation:** Rehabilitation projects which do not involve use group changes are not subject to energy efficiency requirements except where new construction or alterations to existing structures occur. In these instances exposed building cavities and alterations shall be upgraded to comply with applicable provisions of the 2012 IECC.

i) **This section shall apply to the extent not exempted by the Historic Preservation Office of the State of Kentucky.**

7) Testing:

a) Building envelope leakage testing must be completed in accordance with the 2012 IECC and reported to KHC for all new construction and adaptive reuse structures.

b) Rehabilitated structures shall be tested to verify minimum ventilation rates are met per ASHRAE standards.

c) Testing must also verify compliance with the applicable ASHRAE Standard for ventilation and acceptable indoor air quality. (ASHRAE 62.2 or ASHRAE 62.1)

d) A minimum of ten percent of the total units shall be tested at or before final inspection.

i) Units shall be selected by KHC for testing.

e) **Diagnostic testing** shall be reported by one of the following methods:

i) Documentation from a licensed and certified HERS rater.

ii) Documentation from a Building Analyst, licensed and certified, by the Building Performance Institute.

iii) Documentation from a licensed and certified HVAC contractor, qualified in pressure diagnostic testing of the duct systems and total air infiltration.

iv) Documentation from a Weatherization Assistance Program trained Dwelling Needs Evaluator or Energy Auditor.

v) Other methods will be considered upon written request.

8) Quality Assurance: General Contractors and/or subcontractors shall furnish a written material and labor warranty on all units for a period not less than one full year after occupancy.

- 9) **Unit Size Requirements:** In new construction and adaptive reuse projects the following minimum square foot measurements are required for different types of units. For purposes of this requirement, net square feet are the heated and cooled area of the unit.
- a) **SRO units:** shall contain at least 150 square feet (common kitchen and bath)
 - b) **Efficiency units:** shall contain at least 400 square feet
 - c) **One-bedroom units:** shall contain at least 600 square feet
 - d) **Two-bedroom units:** shall contain at least 800 net square feet
 - e) **Three-bedroom units:** shall contain at least 1,000 net square feet
 - f) **Four-bedroom units:** shall contain at least 1,100 net square feet
- 10) **Universal Design Requirements:** New construction and adaptive reuse projects that receive debt or subsidy financing from KHC equal to fifty percent (50%) or more of the total project hard cost for the purpose of constructing single family or multifamily housing shall comply with KHC's Universal Design Policy.
- a) Please consult KHC's web site for the most current version of the KHC Universal Design requirements:
http://www.kyhousing.org/uploadedFiles/Housing_Production/Design_and_Construction/UniversalDesignStandards.pdf?n=7407
 - b) **Units which are covered by the Fair Housing Amendments Act of 1988** are not required to satisfy Universal Design requirements.

Division 2: Existing Conditions

1. **Soil boring and Testing:** All new construction which contains 12 or more units will be required to have a soils analysis test performed by a Commonwealth of Kentucky approved testing laboratory. KHC reserves the right to require a soils test on any project regardless of construction type or unit size. Results of the test shall comply with KBC requirements.

Division 3: Concrete

1. **Exterior Concrete:** Shall conform to the latest revised Standard Specification for Portland cement, ASTM C595.
 - a. **All exterior concrete** shall have a minimum 28-day compressive strength of 4000 psi and be entrained with 5 percent air with a minimum cement content of 520 lb per cubic yard (5.5 sacks).
 - b. **Expansion-joint material** shall be ½” thick asphalt-impregnated pre-molded fiber, ASTM D1752. Follow American Concrete Institute (ACI) 318.
 - c. **Concrete driveways and parking areas** shall be minimum 5” thick with a minimum 8” inch thick encroachment apron extending to the property line.
 - d. **Exterior concrete for walks, porches, and stoops** shall be minimum 4” thick.
2. **Concrete Finishes:**
 - a. **Exposed Foundations:** Brick, stone, or texture formwork patterns shall be used for all poured in place walls exceeding 3 feet or more exposure.
 - b. **Walkways:** Provide a non slip finish and provide ¼ inch per foot crown or cross slope in the direction of drainage.
3. **Concrete Testing:** All new structural concrete construction containing twelve (12) or more units will be required to have concrete strength tests performed by a Commonwealth of Kentucky approved testing laboratory. Results of the test shall comply with the KBC.

Division 4: Masonry

- 1) **Face Brick:** Shall be ASTM C 216, Type FBS, Grade SW, or equivalent, modular size.
- 2) **Concrete Masonry Units (CMU):** Stucco or split face shall be used for all CMU walls exceeding 3 feet or more exposure.

Division 5: Metals

- 1) **Metal Ties:** For newly constructed units, metal tie-down or “hurricane” straps shall be used at each bearing location of each roof truss, rafter and ceiling joist.
 - a) Correct nails and nailing pattern as required by the manufacturing company of the strap shall be used.
- 2) **Steel Lintels:** Steel lintels, when specified for openings in masonry walls, shall be primed and painted.

Division 6: Woods/Plastics/Rough Carpentry/Millwork

- 1) **Stair Riser and Tread Construction:** Except stairs in individual dwellings, all newly constructed steps shall have a riser not greater than 7” and a tread of 11”.
- 2) **Wood Exposed to Weathering Elements:** All exterior wood shall have a minimum preservative retention rate of 25 percent for above ground applications and a minimum preservative retention rate of 40 percent for all wood in contact with the ground.
- 3) **Wood Decking:** Exterior decking shall consist of composite or pressure treated wood material.
- 4) **Exterior Wood Stairs:** Exterior wood stairs shall be constructed with properly treated dimensional lumber.
- 5) **Exterior Handrails:** Exterior handrails shall be constructed of metal or plastic and must meet all other code requirements pertaining to handrails.

Division 7: Thermal and Moisture Protection

- 1) **Minimum masonry siding:** Siding material of all attached newly constructed units shall consist of a minimum of fifty percent (50%) brick, stone, or other KHC approved materials. The bricked area calculation of fifty percent shall not include window and door areas or brick below finished grade.
- 2) **Weather Protection:** All exposed wood shall be protected from weathering by a minimum of one or more of the following materials or methods.
 - a) **Paint:** One coat primer and two coat exterior enamel.
 - b) **Metal:** 0.019" minimum thickness aluminum, factory finish (coil stock).
 - c) **Naturally Durable Wood:** Redwood, Cedar, or other naturally durable woods may be exposed to weathering conditions without cladding or other protective coverings. Stain or sealing exposed wood is required.
 - d) **Composites:** Cement fiber board or other durable material may be used as approved by KHC.
 - e) **Pressure treated Lumber:**
- 3) **Roof Covering:**
 - a) **Shingles:** Seal tab type over 15 lb. felt, with minimum 25-year product warranty or better.
 - b) **Metal:** 26 gauge minimum thickness aluminum or galvanized steel with factory finish.
- 4) **Gutters and Downspouts:** All structures shall have gutters and downspouts and be appropriately designed with a minimum 5" gutter and a 2"x 3" downspout. All downspouts shall empty onto concrete splash blocks or be piped to an appropriate location.
- 5) **Siding:** Exterior siding shall consist of one or more of the following materials.

This section shall apply to the extent not exempted by the Historic Preservation Office of the State of Kentucky.

 - a) **Composite:** Fiber cement siding, primed, with two-coat minimum finish or factory finish.
 - b) **Metal:** 26 gauge minimum thickness aluminum or galvanized steel with factory finish.
 - c) **Vinyl:** 0.42" minimum thickness, UV protected.
 - d) **Wood:** Cedar or redwood stained or primed once with 2-coat minimum finish.
 - e) **Brick Veneer:** Shall be ASTM C 216, Type FBS, Grade SW, or equivalent, modular size.
 - f) **Artificial Stone or Brick:** Install to manufacturer's installation instructions.
- 6) **Insulation:** In new construction, adaptive reuse, and rehab to the extent the structure is exposed, The building thermal envelope shall be insulated to the following minimum values unless documentation by REScheck or other approved software allows different values:
 - a) **Floors over unconditioned space:**

- b) **Exterior walls:** R-20
- c) **Ceilings:** R-49
- d) **Slab Foundations:** R-10 continuous
- e) **Conditioned Crawl Walls:** R-10 continuous
 - i) For rehab projects exposed cavities shall be insulated to the maximum extent possible utilizing the existing cavity and high density insulation or foam.
 - ii) **This section shall apply to the extent not exempted by the Historic Preservation Office of the State of Kentucky.**

Division 8: Doors, Windows, and Glazing

This section shall apply to the extent not exempted by the Historic Preservation Office of the State of Kentucky.

- 1) **Exterior Doors:** Exterior Doors shall be 1 ¾" thick, made of steel or other equally durable material, insulated unless of solid wood (not particleboard) and be appropriately finished as recommended by the manufacturer.
 - a) **Door Energy Ratings:**
 - i) **All opaque exterior doors** shall have a U-factor equal to or less than 0.21.
 - ii) **Doors less than fifty percent (50%) glass** shall have a U-factor equal to or less than 0.27.
 - iii) **Doors greater than fifty percent (50%) glass** shall possess a U-factor equal to or less than 0.32.
 - b) **Exterior hardware:** All exterior doors shall have a lever key-lock latch, doorknocker, and security accessories (eyelet and deadbolt).
- 2) **Interior Doors:** Solid Wood, Composite or hollow core panel doors.
 - a) **Interior doors** shall be a minimum of 1 ⅜" thick.
 - b) **Interior Hardware:** All doors except closets shall be equipped with lever-handle hardware.
 - i) **All bedrooms and bathrooms** shall be equipped with privacy locks.
- 3) **Windows:** All new construction and replacement windows shall meet the following requirements:
 - a) **All window frames** must be of solid vinyl, thermally broken aluminum, fiberglass, wood or wood clad.
 - b) **The vapor seal** on the glazing must have a minimum ten-year warranty.
 - c) **The operation** of all windows shall have a minimum one-year warranty.
 - d) **All windows** shall have a **National Fenestration Rating** meeting minimum energy code requirements for Zone 4, as shown in the 2012 International Energy Conservation Code zone map.

- i) **All windows** shall have a U-Factor equal to or less than 0.32 and an SHGC rating equal to or less than 0.40.

Division 9: Finishes

- 1) **Exterior Ceiling:** When using vinyl or aluminum material for porch ceilings, provide a rigid, solid backing such as OSB or plywood.
- 2) **Exterior Finishes:** Exterior building elements of the following materials shall be properly finished.
 - a) **Posts and Columns:** All new posts columns and guardrails at deck level and above shall be factory made and finished.
 - i) **This section shall apply to the extent not exempted by the Historic Preservation Office of the State of Kentucky.**
 - b) **Handrails:** Exterior handrails shall be smooth, weather resistant, and painted or factory finished.
 - c) **Fiber Cement Siding:** Shall be factory finished or be painted with at least two coats of exterior grade paint.
- 3) **Entry Door Floor Finish:** On the interior side of the main entry door within each dwelling unit, there shall be an uncarpeted, finished floor area.
 - a) **This area** shall be no less than sixteen (16) square feet.
- 4) **Finished Floor Treatments:** **All interior floor finishes** shall meet one or more of the following standards:
 - a) **Sheet Carpet:** 25 oz. minimum, 100 percent nylon. Other options include Berber type with blended fiber. In high traffic areas, 30 oz. Minimum is required.
 - b) **Carpet Padding:** Minimum 7/16" thick, 6-lb. re-bond polyurethane.
 - c) **Sheet Vinyl:** Shall be Armstrong or equivalent minimum 10 mil wear layer.
 - i) Provide product adhesive and underlayment as recommended by the manufacturer.
 - ii) All surfaces shall be clean, dry, and appropriate temperature during installation.
 - iii) Vinyl sheet flooring shall conform to the requirements of ASTM F 1303, Type I.
 - d) **Vinyl Tile:** Shall be Armstrong or other approved equal, 1/8" x 12" x 12".
 - i) Provide product adhesive and underlayment as recommended by the manufacturer.

- ii) All surfaces shall be clean, dry, and appropriate temperature during installation.
 - iii) Follow manufacture's recommendation for pattern layout.
 - e) **Wood Flooring:** Flooring shall be tongue and groove hardwood; factory finished, or have a minimum of three coats of site-applied, UV-protective polyurethane.
 - f) **Other Flooring Products:** Ceramic tile and laminates shall be installed in accordance with manufacturer's specifications.
- 5) **Interior Doors:** Interior doors shall be appropriately finished, painted, or stained as follows:
- a) **Paint:** primed once, with two-coat enamel finish on all sides and faces.
 - b) **Stain:** stain or oil on all sides and faces, with three-coat varnish, polyurethane finish
- 6) **Moisture-Resistant Drywall:** Moisture-resistant gypsum board (commonly called "green board") or equivalent must be used on all walls in the bathroom and within six feet of water sources, where the drywall can be splashed, such as kitchen sink, next to water heater, and/or clothes washer.
- a) Water-resistant gypsum board or equivalent shall be provided behind any tub/shower unit located on an exterior wall.
 - b) Water-resistant gypsum, when used on ceilings must be rated for the span.
- 7) **Interior Wall Finishes:** Primed once, two-coat finish or sufficient coatings to provide coverage where no underlying finishes are visible when using combination finish paint with primer included in the paint.

Division 10: Specialties

- 1) **Trash Collection:** Provisions for dumpsters or trash cans are required.
 - a) **Screening** of trash cans and/or dumpsters shall be provided.
- 2) **Laundry:** All newly constructed units including adaptive reuse, except SROs and efficiencies, shall be equipped with washer and dryer hookups.
 - a) Unless individual units are supplied with laundry hook ups, all projects including adaptive reuse and rehabilitation consisting of twelve (12) or more units shall provide common laundry facilities including a minimum of one (1) washer and one (1) dryer per every twelve units.
- 3) **Roof Offsets:** Projects of four (4) or more attached units shall incorporate varying the roof line with offsets, gable porch roofs, etc.

- 4) **Roof Pitch:** The minimum slope on all newly constructed roofs except porch roofs shall be 4" vertical to 12" horizontal.
- 5) **Entries:** The main common entry to each group of newly constructed dwellings or each main exterior entry to individual dwellings shall have a concrete, treated wood, or other hard surface exterior stoop, porch or deck, a minimum of 5' x 5'.
 - a) **All main entries** shall have a roof or awning over the minimum 5' x 5' entry area.

Division 11: Equipment

- 1) **Refrigerator:** A refrigerator shall be provided in all dwelling units on all projects including new construction and adaptive reuse projects as well as rehabilitation projects where identified in the PCNA (physical/capital needs assessment).
 - a) **All refrigerators must be Energy Star qualified.** The Energy Star mark must be clearly marked on the product, clearly displayed in product literature, and listed on the manufacturer's Internet site.
- 2) **Range:** A range shall be provided in all dwelling units on all projects including new construction and adaptive reuse projects as well as rehabilitation projects where identified in the PCNA (physical/capital needs assessment).
- 3) **Dishwasher:** A dishwasher shall be provided in all newly constructed units and those resulting from adaptive reuse. Dishwashers shall also be provided in units resulting from rehabilitation activities where they had either previously existed or dwelling units were newly created due to structural change.
 - a) Standard dishwashers shall use less than 4.25 gallons per cycle and 295 kWh per year.
- 4) **All clothes washers provided in individual units** shall have an MEF equal to or greater than 2.0 and a WF equal to or less than 6.0.
 - a) **All laundry facilities located above any habitable space** shall be equipped with a properly installed washer overflow pan piped to carry the overflow into the DWV, positive outside drain or an approved floor drain.
- 5) **All clothes washers provided in common laundries** shall have a Modified Energy Factor (MEF) equal to or greater than 2.2 and a Water Factor (WF) equal to or less than 4.5.
 - a) **All laundry facilities located above any habitable space** shall be equipped with a properly installed washer overflow pan piped to carry the overflow into the DWV, positive outside drain or an approved floor drain.

Division 12: Furnishings

- 1) **Cabinets and Drawers:** Cabinet fronts shall be made of solid wood (not particleboard); doors, draws and fronts shall be factory finished.
 - a) **Cabinet ends** shall be finished with appropriate veneer.
 - b) **All cabinets** shall be Kitchen Cabinet Manufacturers Association (KCMA) approved.
- 2) **Countertops:** Countertops shall be molded roll-backed, laminate plastic or Formica with finished ends and sealed at the cut out for sink.
 - a) **Other appropriate materials** may be used such as Corian™. Consult the KHC Department of Design and Construction Review.
- 3) **Closet Storage/Accessories:** Clothes closets shall contain a 12” deep shelf, including a coat rod. Shelves with integrated hangar hooks may also be used.
- 4) **Mailboxes:** All units shall have a USPS approved mailbox either at each individual unit or in a common area.
- 5) **Bath Accessories:** Dwelling unit bathrooms shall be equipped with the following:
 - a) **Medicine cabinet** with mirror 16” wide by 20” tall (minimum)
 - i) Other combinations of mirror and storage may be acceptable by approval of KHC.
 - b) Wall hung **toilet paper dispenser**
 - c) 18” (minimum) towel bar
 - d) Shower rod

Division 13: Special Construction

This section shall apply to the extent not exempted by the Historic Preservation Office of the State of Kentucky.

- 1) **Storage areas:** Exterior or interior tenant storage areas are required on all newly constructed units and adaptive reuse projects, unless exempted by SHIPO and excluding SROs and efficiency units.
 - a) The storage area shall be a minimum of twenty-five (25) square feet and provide 7 feet of headroom.
 - b) Structures must satisfy applicable building code requirements.

- c) Prefabricated plastic structures are prohibited.
 - d) All storage areas shall match exterior building veneer, trim, and possess identical shingles.
- 2) **Ramps:** All newly constructed accessible ramps shall meet the following specifications and applicable accessibility standards:
- (1) Ramps shall be constructed a minimum of 42" wide.
 - (2) Each landing shall have 5' turning areas at the top and bottom of each ramp run.
 - (3) Ramps shall not exceed a maximum slope of 1:12 and a maximum rise of 30".
 - (4) Ramps and landings shall have a minimum load capacity of 300 lbs. concentrated load applied in a 4 square inch area and a uniform live load of 100 pounds per square foot.
- a) **Existing ramps** not part of an accessible route may be no steeper than 1:8.
 - b) **Portable or temporary ramps are prohibited** and may not substitute for locations requiring a permanent ramp.
 - c) **Ramp construction materials:** Ramps may be constructed of the following materials:
 - i) **Composite:** PVC or other with non-skid surface.
 - ii) **Concrete:** with non-skid surface.
 - iii) **Metal:** galvanized steel, or aluminum with non-skid surface.
 - iv) **Wood:** All exterior wood shall have a minimum preservative retention rate of 25 percent for above ground applications and a minimum preservative retention rate of 40 percent for all wood in contact with the ground. Use of CCA treated lumber is prohibited.
- 2) **Playgrounds:** Playgrounds shall meet the following standards and be approved by KHC prior to installation.
- a) ASTM F1487-11, Standard Consumer Safety Performance Specification for Playground Equipment for Public Use
 - b) ASTM F1292-09, Standard Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment
 - c) ASTM F1951-09b, Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment
 - d) ASTM F2223-10, Standard Guide for ASTM Standards on Playground Surfacing
 - e) ASTM F2479-12, Standard Guide for Specification, Purchase, Installation and Maintenance of Poured-in-Place Playground Surfacing
 - f) ASTM F2049-11, Standard Guide for Fences/Barriers for Public, Commercial, and Multifamily Residential Use Outdoor Play Areas
 - g) ASTM F2075-10a, Standard Specification for Engineered Wood Fiber for Use as a Playground Safety Surface Under and Around Playground Equipment
 - h) DOJ 2010 ADA Standard for Accessible Design

Division 21: Fire Suppression

- 1) Reserved for future use

Division 22: Plumbing

- 1) **Minimum Grade of Fixtures:** The following specifications shall be the minimum size and/or quality for new or replacement plumbing fixtures.
 - a) **Bath Tub:** Tubs shall be 30" minimum width; made of fiberglass, acrylic, porcelain cast iron, enameled steel, or cultured marble.
 - b) **Shower:** Showers shall be 36" x 36" minimum; made of fiberglass, acrylic, ceramic, or, cultured marble.
 - c) **Water Closets:** Water closets shall be maximum 1.28 GPF and made of porcelain.
 - d) **Faucets:** Polished chrome polished brass, brushed nickel, and similar plated finishes. Lever handles are required. Faucets containing plastic material for exterior housing are prohibited.
 - e) **Lavatories:** Sinks shall be 15" minimum diameter; made of fiberglass, acrylic, porcelain, or, cultured marble.
 - f) **Kitchen Sink:** Except roll under sinks required in mobility impaired dwelling units, sinks shall be a minimum eight inches (8") deep, stainless steel double bowl.
- 2) **Water Supply Piping:** Water Supply Lines shall be of approved material.
 - a) Installation in exterior walls except for hose bibs is prohibited.
 - b) Lines located in all crawl areas shall be insulated.
 - c) All hot water lines shall be insulated equal to or greater than R-3.
- 3) **Overflow Protection Accessories:** Water heaters located above any habitable space shall have an overflow pan properly plumbed into DWV, positive drain outside or an approved floor drain.
- 4) **Water Heater Efficiency:**
 - a) **Electric water heaters** shall have a minimum Energy Efficiency rating of .92.
 - b) **Gas fired water heaters** shall an EF equal to or greater than 0.67.
 - c) **Instantaneous gas water heaters** shall have an EF equal to or greater than 0.82.

Division 23: Heating Ventilating and Air Conditioning

- 1) **Heating Ventilating and Air Conditioning Equipment:** All new construction and rehabilitation units where replacement HVAC units are included in the scope of work shall be heated and cooled using high-efficiency equipment.
 - a) **Heat pump systems** shall have a minimum SEER (Seasonal Energy Efficiency Rating) rating of 14.5 with a minimum HSPF (Heating Seasonal Performance Factor) rating of 8.5.
 - b) **Fuel oil, gas fired furnaces and boilers** shall have an Annual Fuel Utilization Efficiency (AFUE) equal to or greater than ninety-two percent (92%).
 - c) **Electric-resistance-only** heat systems are **prohibited**.
 - d) Alternative HVAC systems may be approved by KHC's Department of Design and construction Review.
- 2) **Duct Insulation:** All supply air, return air, and exhaust air ducts installed in unconditioned spaces outside the thermal envelope shall be sealed and insulated with a minimum R-8 insulation wrap and installed free of restrictions.
- 3) **Programmable Thermostats:** All new and replacement individual HVAC systems shall be controlled by a programmable thermostat.
- 4) **Range Hoods:**
 - a) New construction and adaptive reuse dwelling units shall be equipped with energy efficient, minimum 150 CFM, range hoods or recirculation fan microwave ovens.
 - i) Use ducting material sized per manufacturer recommendation.
 - ii) Exposed ducting is prohibited and where installed above cabinets, ducts shall have a finished cover.
 - iii) Recirculation combination microwave hoods or range hoods shall be equipped with an activated charcoal filter.
 - b) Rehabilitated units shall be equipped with a vented range hood, recirculation range hood, vented microwave oven, or an unvented microwave oven.
 - i) Use ducting sized and ducting material per manufacturer recommendation.
 - ii) Exposed ducting is prohibited and where installed above cabinets, ducts shall have a finished cover.
 - iii) Recirculation combination microwave hoods or range hoods shall be equipped with an activated charcoal filter.
- 5) **Exhaust and Ceiling Paddle Fans:** All new construction, newly installed in rehabs due to ventilation rate code requirements, and replacement paddle and ventilation fans shall be Energy Star qualified.
 - a) The Energy Star mark must be clearly marked on the product, clearly displayed in product literature and listed on the manufacturer's web site.

Division 26: Electrical

- 1) **Common Area Lighting:** Luminaries shall be located at all entrances and common areas.
 - a) The electrical supply for all common areas, stairways, and walkways shall not originate from an individual unit.
- 2) **Parking Lot Lighting:** All onsite parking areas shall be lighted.
 - a) The electrical supply for all parking areas shall not originate from an individual unit.
- 3) **Dwelling Unit Lighting:** In new construction and adaptive reuse projects each room, hall, stair, and walk in closet shall have a minimum of one switch-operated overhead light.
 - a) Kitchens shall include switch-operated lighting over the cooking area, sink and the general or dining area.
 - b) Bathrooms shall be equipped with switch-operated lighting over the lavatory area and the general area.
- 4) **Energy Efficient Lighting:** All newly installed or replacement interior luminaries shall be Energy Star qualified.
 - a) The Energy Star mark must be clearly marked on the front/top of the product, clearly displayed in product literature and listed on the manufacturer's Internet site.

Division 27: Communications

- 1) **Telephone Access:** All dwelling units shall be wired for telephone service.
- 2) **Cable Access:** All dwelling units shall be wired for cable service or a local antennae system.
- 3) **Internet Connectivity:** All dwelling units shall have the ability to connect to the internet by one or more of the following means.
 - a) **Telephone Connection:** Connectivity may be accomplished by prewired telephone jacks installed within the dwelling.

- b) **Cable Modem:** Connectivity may be accomplished by prewired cable jacks installed within the dwelling.
- c) **Wireless Connection provided by the property:** A secured wireless router may be provided for internet connectivity by the residents of the property in lieu of wired connections.
 - i) All dwellings units shall be supplied with signal strength adequate for connection to the internet.
 - ii) Common areas accessible by the residents shall be supplied with signal strength adequate for connection to the internet.
- 4) **Help/Call for Aid:** Where installed, help/ Call for Aid systems shall at minimum alert persons outside the dwelling unit by visual and/or audible means.
 - a) Audible systems shall produce sound at a level of at least 15 decibels above ambient noise levels near the dwelling unit.
 - i) The notification sound shall not be similar to a fire alarm notification.
 - b) Visual notification systems shall be visible to persons within 200 feet from the dwelling and be a flashing strobe.
 - c) An activation device shall be installed in all bedrooms, bathrooms, and living rooms of the dwelling unit.
- 5) **Sensory Impaired Units:** All sensory impaired dwelling units shall be equipped with audible and visual notification devices for the benefit of the occupant to know when someone is at the entry door, when the telephone rings, and when there is smoke or carbon monoxide detected within the dwelling or building.

Division 28: Electronic Safety and Security

- 1) **Fire Detection and Alarm:** Installation of smoke alarms is required in all new construction, adaptive reuse, and rehabilitation projects.
 - a) All local ordinances shall be observed.
 - b) Written manufacturer specifications for the proper installation of individual alarms shall be observed and maintained on site throughout construction.
 - i) Instructions for specific locations and other installation details shall be strictly observed.

- ii) Individual smoke alarms shall be installed on all floors and in all bedrooms and hallways no more than eight (8) feet from any bedroom door within the dwelling unit.
- 2) **Carbon Monoxide Alarms:** UL listed carbon monoxide alarm(s) shall be installed outside each sleeping area in the immediate vicinity of all bedrooms if the dwelling or building contains fuel burning appliances and/or has an attached garage.

Division 31: Earthwork

- 1) **Soil Testing:** All new construction that contains 12 or more units and/or building sites determined necessary by KHC's construction specialists will be required to have a geotechnical investigation performed by a design professional registered in the Commonwealth of Kentucky.
- a) **Investigation Report:** Results of the test shall comply with the applicable building code requirements and be submitted to KHC.
 - i) At a minimum the report submitted to KHC shall contain recommendations for foundation type and design criteria, including but not limited to: bearing capacity of natural or compacted soil; provisions to mitigate the effects of expansive soils; mitigation of the effects of liquefaction, differential settlement and varying soil strength; and the effects of adjacent loads.
- 2) **Steep Slopes:** Setbacks or clearances may occur where units are placed on sites that have adjacent steep slopes of 33.3% (1 foot rise: 3 feet run) or greater.
- a) Setbacks indicated in the current Kentucky Building or Residential Code, from the top or bottom of the slope, shall be observed and included in the building's design.
 - i) Building foundations located within the required setback indicated in the building codes shall be designed by a registered design professional.

Division 32: Exterior Improvements

- 1) **Landscaping:** Adequate landscaping is required on all multifamily projects.
 - a) **Installation:** Landscaping shall be installed according to the **approved** landscape plan submitted to KHC as part of final plans and specifications.
 - b) **Turf:**
 - i) **All side and rear lawn** areas shall be seeded with the seed variety, lime, and fertilizer application rate, which is appropriate to establish a good lawn cover.
 - ii) **Sod is required** in building front yards and common areas for all projects requiring establishment of new grass.
 - iii) **All slopes in excess of 33.3%** (1:3) within 10 feet of the building, driveway and/or walkway shall receive sod or other approved erosion control materials which will enhance the establishment of a permanent ground cover.
- 2) **Parking/Driveways:** All multifamily projects shall have adequate parking as determined by KHC.
 - a) All on-site parking lots and access drives are to be paved.
 - i) Asphalt shall consist of a hot mix asphaltic pavement, manufactured by local asphalt plants and be placed a minimum of 4" thick.
 - ii) Pervious concrete parking surfaces shall be properly drained to prevent accumulation of water.
 - iii) Parking for places of historic significance shall comply with the State Historic Preservation Office's requirements.
 - b) Unless prohibited by urban location, local code, jurisdiction, or structural constraints, all projects shall have a minimum of one parking space per unit.
 - i) Parking spaces shall have wheel stops or curbs.
 - (1) If walkways are used as wheel stops, the walkway shall be 6' wide.
- 3) **Walkways:** All dwelling units and common use facilities shall have a paved walkway from the parking area to the main entrance and connecting dwelling units to common use areas and public sidewalks.
 - a) All entry walks shall be a minimum of 42 "wide.

Division 33: Utilities Services

- 1) **Availability:** Required building utility services shall be available before construction begins at the building site in sufficient size to adequately provide sufficient power, flow, volume, pressure, and drainage to allow for safe, dependable service of appliances and fixtures.
 - a) **Septic or sewage treatment systems** may be constructed onsite as construction progresses and shall be capable of performing intended functions prior to occupancy.
- 2) **Electric:** Electrical service to newly constructed units shall be installed underground except in cases where deemed structurally infeasible.