

NEW HOUSING CONSTRUCTION STANDARD SPECIFICATIONS

JUNE 2021

Note: Photos in the specifications are for informational purposes only and not intended to be specifications.

Kriss Lowry & Associates, Inc.
227 S. Rays Fork Rd.
Corinth, KY 41010-3027

(502) 857-2800
(502) 857-2401
kriss@krisslowry.com



Kriss Lowry & Associates, Inc.

**HOUSING REHABILITATION
STANDARD SPECIFICATIONS**

JUNE 2021

TABLE OF CONTENTS

- I. GENERAL REQUIREMENTS.....3
 - A. Infection Control Measures for Covid-193
 - B. COVID 19 Crew Training.....3
 - C. Specifications.....4
 - D. Universal Design Standards4
 - E. General Requirements.....6
- II. SITE WORK9
 - A. Demolition9
- III. CONCRETE10
 - A. Footings10
 - B. Basements12
- IV. MASONRY13
 - A. Foundations.....13
- V. METALS15
 - A. Roof tie downs15
- VI. WOODS, PLASTICS & ROUGH CARPENTRY15
 - A. Floor Framing15
 - B. Exterior Walls15
 - C. Roof Truss Specifications16
 - D. Porches and Decks17
 - E. Handrails18
 - F. Guardrails.....19
 - G. Ramps19
- VII. THERMAL AND MOISTURE PROTECTION20
 - A. Sealants20
 - B. Roofing20
 - C. Siding.....20
 - D. Gutters and Downspouts21
 - E. Insulation21
- VIII. WINDOWS AND DOORS23
 - A. Exterior Doors.....23
 - B. storm doors24
 - C. interior doors.....24
 - D. Windows24
- IX. FINISHES25
 - A. Gypsum Drywall.....25
 - B. Painting: Interior and Exterior26
 - C. Floor Covering.....27
- X. SPECIALTIES28
 - A. Bath Accessories28
 - B. Mailbox.....28
 - C. Street address29
- XI. EQUIPMENT29
 - A. Kitchen Equipment29
 - B. Bath/Kitchen Fixtures30
 - C. Washer & Dryer Hookups.....31
 - D. Bathtubs/Showers31
- XII. FURNISHINGS.....33
 - A. Cabinets33

B.	Countertops.....	33
C.	ADA Compliant countertops and cabinets.....	33
D.	Closet Storage/Accessories.....	33
XIII.	SPECIAL CONSTRUCTION.....	34
A.	Storage Shed.....	34
XIV.	PLUMBING.....	35
A.	Plumbing Standards.....	35
B.	Water Heater.....	35
C.	Water/Sewer lines.....	36
XV.	HVAC.....	36
	38
B.	Bathroom Ventilation.....	39
XVI.	ELECTRICAL.....	39
XVII.	ELECTRONIC SAFETY AND SECURITY.....	40
A.	smoke detectors.....	40
B.	carbon monoxide alarm.....	41
XVIII.	EARTHWORK.....	41
A.	Drainage.....	41
XIX.	EXTERIOR IMPROVEMENTS.....	42
A.	Lawns and Plantings.....	42
B.	Driveways.....	42
C.	Walkways.....	43
D.	Public Sidewalks.....	43
E.	Termite Treatment.....	44
XX.	UTILITY SERVICES.....	44
A.	Site Utilities.....	44

I. GENERAL REQUIREMENTS

A. INFECTION CONTROL MEASURES FOR COVID-19

1. All Contractors shall implement infection control measures.
2. Prohibit handshaking, maintain social distancing of 6 feet.
3. Frequent handwashing with soap and water for at least 20 seconds, and regular use of hand sanitizer with at least 60% alcohol when soap and water are unavailable.
4. Avoid touching eyes, nose or mouth with unwashed hands.
5. Routine, daily disinfecting of equipment and tools being used in the field
6. All surfaces should be sanitized at the end of each job.

B. COVID 19 CREW TRAINING

1. Ensure your organization is complying with the Governor's Healthy at Work guidelines, CDC guidelines, and OSHA requirements.
2. Train and equip all field workers with Personal Protective Equipment (PPE) and how to properly use it, remove it and clean it to avoid contamination of self and others. Examples of PPE include gloves, goggles, face shields and masks, N95 filtering respirators.
3. Provide crews with sanitary wipes that can be used to clean surfaces in clients' homes both before and after performing work. See the EPA list of disinfectants for use against SARS-CoV-2 (novel coronavirus).
4. Ensure all vehicles and crew members are equipped with hand sanitizer with at least 60% alcohol.
5. Minimize the number of crew and clients in the home at the time of interior work; try to isolate clients to one room. Crews conducting interior work will wear PPE at the highest level available and required by the construction measure. At minimum, all staff must wear masks and gloves when in client homes.
6. Crews conducting interior work will wear PPE to cover eyes, nose, mouth, and hands.
7. Clients remaining in the home should wear face masks when crews are in the home. Crews should offer face masks to clients without their own masks.
8. Consider installing a physical barrier, such as a clear sheet of plastic, to isolate a client while interior work is being conducted.
9. If workers arrive at a site and determine a client is exhibiting respiratory illness, crews should not proceed with work and it should be reported to the City's Project Manager.

C. SPECIFICATIONS.

1. All work is to be in accordance with the current edition of Kentucky Residential Code, the Kentucky Plumbing Code, the National Electric Code and the National Fuel Gas Code, the International Property Maintenance Code, Kentucky Housing Corporation's Minimum Design Standards for Rehabilitation of Single Family Housing Revision 2019 and the Housing Rehabilitation Standard Specifications and any applicable state and local codes.
2. Work shall be done in accordance with the drawings, if any. Kentucky Residential Code takes precedence over the drawings as a minimum standard. Drawings shall be followed when they exceed the code.

D. UNIVERSAL DESIGN STANDARDS

1. Any rehabilitation work done involving the housing components listed in this section shall be done in accordance with these universal design standards.
2. Universal design is a building concept that incorporates products, general design layouts and characteristics into residences in order to:
 - a) Make the residence usable by the greatest number of people
 - b) Respond to the changing needs of the resident
 - c) Improve marketability of the residence
3. The goal of universal design is to build housing that meets the needs of the greatest possible portion of a community's population. It differs from accessible design, which is primarily intended to meet the needs of persons with disabilities. It is, however, inclusive of adaptable design as it strives to incorporate structural features that will allow a residence to be adapted to an individual's needs.
4. **Hallways:** All hallways shall have a net clear (finish wall to finish wall) opening width of 42". Definition of hallway is any passageway that is 18" or greater in depth.
5. **Interior Doorways:** All passage doors from room to room, including all bedroom doors and all primary bedroom closet doors, shall have a minimum net clear opening of 32". Doorways to smaller secondary closets, linen, storage, coat, mechanical and secondary bedroom closets that are less than 4' wide x 2' deep, are not required to have a net clear opening of 32" but it is preferred.
6. 3). **Bathrooms:** All housing shall have a minimum of one full universally designed bathroom located on the grade level.
 - a) Lavatories shall have a 30" x 48" clear floor space. The clear floor space may be rotated or angled, depending upon approach and design. In a side approach, the 48" dimension shall be parallel to the lavatory. In a forward approach, the

48" dimension shall be perpendicular to the lavatory. The bowl shall be centered in either the 30" or 48" dimension. The clear area shall be free from all wall projections, tub, shower, toilet or the lavatory base. If a wall-hung, breakaway-style" base or pedestal lavatory is used, the clear space may encroach a maximum of 19" underneath the base in a forward approach design.

- b) Toilets shall be centered a minimum of 18" from any corner wall, base cabinet or tub.
7. **All bathtubs and/or showers shall be equipped with at least two properly anchored and supported 30" minimum grab bars with wall reinforcement. One grab bar shall be a vertical bar near front of tub or shower. Second grab bar shall be a horizontal bar installed 33" to 36" inches high on rear of tub or shower. Tub and shower walls are not to have curved areas where the grab bars are to be installed which prevent proper anchoring. Install a grab bar on the wall next to each toilet.** If special conditions state that grab bars are not to be installed, install 2" x 10" wood blocking, plywood or other approved material for future grab bars in the toilet, tub and/or shower area. The wall reinforcement shall be located 33" to 36" AFF (above finished floor). Americans with Disability (ADA) compliant reinforced tubs may be used.



Grab bar next to toilet and in tub (note: white grab bars are preferred)

8. **Entry Door:** The primary entry door must meet the following requirements:
- a) An exterior level platform with a minimum of 5'x 5' clear floor space. This platform must be within 1/2" of the interior finished floor at the point of entrance and a maximum threshold rise of 1-1/4" when approaching from the outside (structural and decorative supports may overlap perimeter of the clear floor space).
 - b) The entry door threshold must not project more than 3/4" above the interior finished floor. At the point of entry of this door, the interior must have a 5'x 5' clear floor space.

9. **Faucets:** Single-lever faucets or ADA-approved faucets shall be installed at all sinks, showers and tubs.
10. **Electrical:** Light switches, fan switches and thermostats shall have a maximum height of 48” centered on the switch or thermostat face cover. Mounting heights for electrical outlets shall have minimum height of 15” AFF from the bottom outlet or a maximum height of 48” AFF from the top outlet. Note: If an outlet or switch is obstructed by a base cabinet or countertop, then the maximum height for a switch or outlet shall be 46” AFF.
11. **Bedroom:** All units shall have a minimum of one bedroom on the grade level.
12. **Exterior Access:** A walkway from the parking area to one entry door must be 42” wide and made of concrete. One entrance is to have an accessible ramp or walkway with a maximum slope of one unit vertical in twelve units horizontal (8.3 percent slope). This entrance is to be a sloped concrete walkway to the front or rear porch or deck. If this cannot be achieved due to site conditions, than an accessible ramp shall be constructed to the rear entrance. Accessible ramps to the front entrance must be approved by the project manager.

Accessible Walkway Entrances:



GENERAL REQUIREMENTS

1. All work is to be done in a professional, workmanlike manner taking care to protect the owner's property and surrounding properties. The contractor is responsible for any damage caused during the execution of the work.
2. Contractor is responsible for calling 811 before any digging to have all underground utilities located. Contractor is responsible for cost of repairs to any damaged underground utilities.
3. No changes are to be made without written consent of the owner and the project manager.
4. Contractors shall provide samples of the following to the Project Manager: carpet, vinyl flooring, shutters, cabinets, windows (including documentation that the window meets energy and egress standards), counter tops, vinyl siding, interior and exterior paint and shingles before any construction begins. Project Manager will have owner select colors from samples provided at preconstruction meeting.
5. Contractor is responsible for any required permits (building, zoning, demolition etc.) and inspection fees unless otherwise noted in the Special Conditions or Information for Bidders. **The Building Permit shall be posted in the house at time house is framed, even if permit fee is waived.** A footer, framing and final inspection by a Kentucky certified building inspector is required on all houses prior to payment for foundation, framing and final payment as appropriate. Documentation of the inspection must be provided to the project manager. Rough-in and final plumbing, electrical and HVAC inspections shall be conducted when required by State or local law. Payment for electrical, plumbing and HVAC work shall be ½ after rough-in inspection and ½ after final inspection. Inspection approval stickers must be placed in a readily visible location in the house.
6. Construction debris is to be cleaned up daily to keep exits, traffic areas, walks, etc. safe for workers, residents, and visitors. All debris is to be properly disposed of in accordance with state regulations.
7. Unless otherwise noted, "install" shall mean "furnish and install."
8. Installation of any item requiring a finish shall include finishing unless otherwise noted. Any item installed that does not have final protective finish is to include proper coating as part of the installation.
9. Installation of any item shall include all necessary related hardware, trim, prep work, etc. Materials shall be new, in good condition and of the grade required by code or specifications.
10. For any brand name specified, another brand of equal quality may be substituted. Consult with the project manager before making substitutions.
11. Disturbed areas (including areas disturbed due to demolition on site or off site utility work) of grade for swales, ditches, etc. shall be filled with topsoil and graded smooth before seeding and mulching with clean straw or other approved mulch. All clods, rocks and debris over two inches in diameter are to be removed. Contractor shall provide erosion control measures such as hay bales as necessary to prevent erosion of soils from the site.

12. All adhesives, sealants and primers used on the interior of the building shall comply with South Coast Air Quality Management District Rule #1168. Acceptable volatile organic compound (VOC) limits are listed in the tables below:

Architectural Applications	Current VOC Limit
Indoor Carpet Adhesives	50
Carpet Pad Adhesives	50
Outdoor Carpet Adhesives	150
Wood Flooring Adhesive	100
Rubber Floor Adhesives	60
Subfloor Adhesives	50
Ceramic Tile Adhesives	65
VCT and Asphalt Tile Adhesives	50
Dry Wall and Panel Adhesives	50
Cove Base Adhesives	50
Multipurpose Construction Adhesives	70
Structural Glazing Adhesives	100
Single Ply Roof Membrane Adhesives	250

Substrate Specific Applications	Current VOC Limit
Metal to Metal	30
Plastic Foams	50
Porous Material (except wood)	50
Wood	30
Fiberglass	80

Sealants	Current VOC Limit
Architectural	250
Sealant Primers	Current VOC Limit
Architectural	
Non Porous	250
Porous	775

II. SITE WORK

A. DEMOLITION

1. All demolition work shall be done in a safe and workmanlike manner. Contractor is to verify that all utilities have been turned off and properly sealed or disconnected before proceeding with demolition work.
2. Demolition debris shall be removed as it accumulates and shall not be stored on site. All debris shall be disposed of in accordance with state and Federal regulations. Open dumping of waste is strictly prohibited. Open burning is prohibited by 401 KAR 63:005. Debris shall not be burned on site. Contractor is to provide landfill or recycling facility receipts to project manager prior to payment.
3. In accordance with 401 KAR 60:010, all reasonable precautions shall be taken to prevent particulate matter from becoming airborne including covering of open bodied trucks, wetting material is very dry and dusty, and preventing materials from being deposited onto a street or roadway.
4. In accordance with state and Federal regulations, contractor is to take all reasonable precautions to prevent particulate matter from entering the storm water drainage system including but not limited to silt fences or straw bales to control runoff, diversion ditches, temporary storage ponds, etc.
5. All old existing walls, floors, curbs, footers, piers, pavements and other improvements shall be entirely removed from the location of new footings and foundations and removed to a minimum of thirty-six inches below existing grade or required subgrade for other locations. Clean out any existing wells, cisterns, abandoned manholes, catch basins, septic tanks, sink holes and similar structures and fill with granular material, firmly compacted. Install cap and seal with Fernco type coupling or equivalent on any old sewer lines. Plug with concrete or masonry the open ends of abandoned manholes, catch basins or similar structures encountered in any excavation. Break up masonry or concrete bottoms of existing cisterns or similar structures to permit drainage.
6. **Removal of trees and shrubs is to include removal of roots and stumps (clearing and grubbing). If fence line is to be cleaned out, all trees, shrubs and roots are to be removed. Project Manager may on a case by case basis approve leaving stumps when stumps cannot be removed due to site considerations (removal will damage sidewalks or utilities). If stump is not removed, it is to be ground down to ground level.**
7. Contractor is to take reasonable precaution not to disturb any permanent survey markers on the property. If markers are moved or destroyed unnecessarily, contractor is to pay a Kentucky licensed land surveyor to reestablish markers.
8. All disturbed areas are to be graded smooth, seeded and covered with straw. Contractor is required to submit any required demolition notices to the

Department of Environmental Protection and obtain any required demolition permits.

9. Contractor may salvage materials from demolition work. Salvaged materials must be promptly removed from the project area and taken to a recycling facility or otherwise stored in a manner in accordance with state and local regulations.
10. Unless otherwise noted, asbestos removal will be done under a separate contract with an asbestos removal firm, prior to demolition or rehabilitation otherwise noted in the special conditions.

III. CONCRETE

A. FOOTINGS

1. Contractor is to provide photographs of the foundation trench taken before the concrete is poured with re-bar tied in place and photographs after pouring. All portions of the footer must be visible in the photographs. This requirement does not relieve the contractor from obtaining a footer inspection from a state licensed building inspector. If the contractor fails to have the footer approved by a building inspector prior to pouring the footer, the contractor shall provide a signed and sealed statement from a Kentucky licensed structural engineer that the footer meets the building code. Written building inspector or engineers report must be provided to project manger prior to payment for foundation.
2. Soil tests. In areas likely to have expansive, compressible, shifting or other unknown soil characteristics, the building official shall determine whether to require a soil test to determine the soil's characteristics at a particular location. This test shall be made by an approved agency using an approved method. **(Table R401.4.1).**
3. Compressible or shifting soil. When top or subsoils are compressible or shifting, such soils shall be removed to a depth and width sufficient to assure stable moisture content in each active zone and shall not be used as fill or stabilized within each active zone by chemical, dewatering or pre-saturation.
4. Surface drainage shall be diverted to a storm sewer conveyance or other approved point of collection so as to not create a hazard. Lots shall be graded so as to drain surface water away from foundation walls. The grade away from foundation walls shall fall a minimum of 6"within the first 10'. (Section R401.3 IRC) Exception: Where lot lines, walls, slopes or other physical barriers prohibit 6" (152 mm) of fall within 10', drains or swales shall be provided to ensure drainage away from the structure.
5. The ground under the dwelling shall be cleared of all vegetation, organic matter and construction debris, leveled and covered with gravel.
6. Grade the crawl space floor to one or more low points. Provide crawl space drain(s) or sump pump(s) at lowest point(s). Slope drains to daylight a minimum of five feet away from foundation and to a location which does not interfere with mowing of the lawn and include an accessible backflow valve and ¼ inch rodent screening. Sump pump covers shall be mechanically attached with full gasket seal or equivalent. When a sump pump is required, it shall be connected to a dedicated electrical outlet

on a dedicated circuit. Gutter drains and foundation drains must not be connected to crawl space drain.

7. Foundation drain and grading around the foundation should be finished as soon as possible to minimize the roof runoff and surface water that can enter the crawl space. If crawl space gets wet during construction, contractor is to provide dehumidifier to dry crawl space to 70% humidity or less prior to installing crawl space insulation and vapor barrier. Close access door while running dehumidifier.
8. Footings are to have the base of said footing below the frost line, and shall be constructed using minimum 2,500 psi concrete. Concrete for footers that may be subject to freezing and thawing during construction shall be air-entrained concrete. The frost line is 24" below the finished grade with some counties being the exception as shown in **Table R403.1.4 KRC** below.

**Table R403.1.4 KRC
MINIMUM FROST PROTECTION DEPTH FOR KENTUCKY**

County	Frost Depth d, (inches)
Bell	27
Boone	30
Breathitt	30
Campbell	30
Clay	27
Floyd	33
Harlan	30
Johnson	30
Kenton	30
Knott	33
Knox	27
Lawrence	27
Leslie	30
Letcher	33
Magoffin	30
Martin	33
Owsley	27
Perry	30
Pike	33
All other KY counties	24

9. Concrete shall conform to the latest revised Standard Specification for Portland Cement, ASTM C595-03. All concrete, except footers, shall have a minimum 28-day compressive strength of 4,000 psi and be entrained with five percent air with a minimum cement content of 520 lb. per cubic yard (5.5) sacks. The minimum concrete thickness is 3 ½". Follow American Concrete Institute (ACI) 318-05. Provide a crushed rock base with a minimum 4" thickness. The maximum weight of fly ash, pozzolans, silica fume or slag that is included in concrete mixtures for garage floor slabs and for exterior porches, carport slabs and steps that will be exposed to de-icing chemicals shall not exceed the percentages of the total weight of cementitious materials.
10. Expansion-joint material shall be ½" thick asphalt-impregnated pre-molded fiber, ASTM D1752. Follow American Concrete Institute (ACI) 318.
11. All exterior walls shall be supported on continuous solid concrete footings of sufficient design to accommodate all loads according to code and to transmit the resulting loads to the soil within the limitations as determined from the character of the soil. Footings shall be supported on undisturbed natural soils or engineered fill.
12. Footings shall be as required for your area for a standard frame house with eight-inch concrete block foundations. Footings will contain two parallel runs of ½-inch rebar, three inches from the ground and staked and saddled. Rebar should be lapped a minimum of 12" and bent around corners and footer steps.

B. BASEMENTS

1. Foundation walls in basements shall be poured concrete walls and have a minimum 28-day compressive strength of 4,000 psi and be entrained with five percent air with a minimum cement content of 520 lb. per cubic yard (5.5) sacks. Foundation shall be **waterproofed** below grade per the building code. Install foundation perimeter drain per code.
2. When basements are constructed, they shall be a minimum of eight feet high and shall be a walkout basement with full size door, interior staircase, poured concrete walls, foundation waterproofing and concrete floor unless otherwise specified in the special conditions. **Brick, stone, or texture formwork patterns shall be used for all poured-in-place walls exceeding three feet or more exposure.**
3. Furnace and hot water tank are to be installed in basement. Washer and dryer are to be installed in basement unless house plans show otherwise.
4. Provide an electrical outlet on the outside wall of the staircase to the upstairs. Enclosed accessible space under stairs shall have walls, under stair surfaces and any soffits protected on the enclosed side with ½ inch gypsum board.
5. When a basement wall will not have any dirt against it, a 6" wood stud exterior frame wall may be constructed with owner and project manager approval. All wood stud walls shall be constructed to the same standards as other finished stud walls in the house including exterior siding, Tyvek house wrap, wood sheathing, minimum R-19 insulation, drywall that is properly finished and painted, electrical outlets to code, etc.
6. Windows installed in basements shall be egress windows unless otherwise approved by owner and project manager.

IV. MASONRY

A. FOUNDATIONS

1. Foundation construction shall be capable of accommodating all loads according to **Section R301** and of transmitting the resulting loads to the supporting soil. Fill soils that support footings and foundations shall be designed, installed and tested in accordance with accepted engineering practice.
2. **Site** should be excavated and the foundation designed to allow a minimum of 24" crawlspace headroom and a minimum of 6" clearance between the bottom of the exterior vinyl siding and the finished exterior grade. All below grade block foundation is to be coated with **foundation** coating/damp proofing.
3. The **foundation walls** shall be a minimum of 8" x 8" x 16" (for brick veneer, use 8" x 12" x 16") concrete block securely constructed using masonry materials. **Split face block shall be used for all CMU walls exceeding three feet or more exposure.** Larger block or reinforcement may be required depending on maximum wall height, maximum unbalanced fill and soil class. All mortar joints are to be troweled and smoothed. All concrete block below finished grade shall be damp-proofed with a bituminous coating. Concrete block for foundation walls that exceed three feet or more of exposure shall be split face block or stucco.
4. Do not install foundation vents in crawl space wall. See insulation and HVAC requirements for conditioned crawl space specifications.
5. **Finished Grade** - If there is evidence that the groundwater table can rise to within 6 inches of the finished floor at the building perimeter or where there is evidence that the surface water does not readily drain from the building site, the grade in the crawl space shall be as high as the outside finished grade, unless an approved drainage system is provided.
6. **Dampproofing** – Except where required to be waterproofed by Section 406.2, foundation walls that retain earth and enclose habitable or usable spaces below grade shall be dampproofed from the top of the footing to the finished grade. Masonry walls shall have no less than 3/8" portland cement parging applied to the exterior of the wall. The parging shall be dampproofed with a bituminous coating, three pounds per square yard or acrylic modified cement, 1/8 inch coat of surface-bonding mortar complying with ASTM C 887 or any material permitted for waterproofing by code.
7. **Crawl space access** to include a minimum 24"x 24" metal frame securely attached to foundation, hinges, hasp lock and paint to match foundation color. Insulate inside of crawl space access door with R-10 rigid insulation board or equivalent foam insulation. **Vinyl siding above the crawl space door shall be properly trimmed so the crawl space door can be opened without touching the vinyl siding.** Crawl space door is to be easily accessible from ground level. **Any well around the crawl space access shall be the same size or slightly larger than the crawl space access door and shall be constructed of solid metal or mortared concrete block capped at the top. The well shall have a minimum of 4 inches of gravel in the bottom. The well shall extend high enough to provide drainage to code away from the well on all sides.**

8. **Beam pockets** will be filled with concrete from surface to footer. The ends of wood girders entering exterior masonry or concrete walls shall have a minimum clearance of 0.5 inches on the tops, sides and ends (except for bearing surface on pillar) or they shall be of treated wood.
9. **Anchor bolts** shall be ½" in diameter and embedded at least 7" in concrete within an open block cell, beginning one foot from each corner, then 48" on center and within 12" of the end of each sill plate. There shall be two bolts per section of plate.
10. **Sill plate** is to be 2" x 8" SYP #2 KD ACQ-treated (0.25 lbs/cu. Ft) and shall cover openings in the block. A foam gasket shall be placed between the sill plate and foundation. Sill plate is to be sealed to foundation with caulk. **NOTE:** The treated sill plate also serves as a termite shield; therefore, if 12" blocks are used, the sill plate will need to be increased to a 2" x 12", or the cells in the top run of blocks will be filled solid with concrete or an acceptable metal termite shield will have to be installed.
11. **Support columns** for center beam shall have concrete footers (piers) constructed using the same minimum 2,500 psi concrete and at the same height as the perimeter footings. The columns shall be constructed of 16" x 16" concrete blocks or properly laid 8" x 8" x 16" concrete blocks. **When there are four blocks or less, piers shall be capped with solid 4-inch blocks or the top section of blocks is to be filled solid with concrete. When there are five blocks or more, all cores are to be filled solid to the base.** Steel is the only acceptable type of shim. Any temporary wood shims shall be removed. **NOTE:** If floor trusses are used, piers are not required, but an engineered, stamped plan for the trusses must be provided to the agency. Columns shall be a maximum of 8' on center. **(Sections R606.6 – 606.6.1 IRC)** The size of the footer will conform to the size of the pier.
12. The **support girder** shall be three (3) SYP KD 2 x 10s securely nailed together. All laminate joints are to be staggered within the beam and placed over the piers. If the contractor chooses to use floor trusses, then the girder may be omitted but the contractor must furnish the agency with an engineered, stamped drawing of the trusses. No cutting, notching or drilling of any support girder is permitted. **There shall be no wood shims between the bottom of the beam and the top of the pier.**
13. All **openings in the sub-floor** must be sealed with 25 year caulk or other method as appropriate. This includes the plumbing pipe openings, furnace ductwork openings and electrical wire openings. All openings in the foundation wall shall be sealed with mortar on both the interior and exterior.
14. Exterior concrete slab on grade. Concrete to be 4,000 PSI, air entrained over pea gravel. Total air content (percent by volume of concrete) shall not be less than 5 percent or more than 7 percent.
15. Interior concrete slab on grade not exposed to weather to be 4,000 PSI. Footers, including footers for piers shall be 3,500 PSI.
16. Porch slabs to include concrete block foundation with crushed limestone or gravel fill graded from ¼" to ¾" size and covered with vapor barrier; 6" wire mesh, expansion joints at wall intersections, 4" minimum thickness, 1.5" overhang and 1/8" per foot slope away from house.

V. METALS

A. ROOF TIE DOWNS

1. Appropriate roof tie-downs per the IRC are required on all houses. Provide at each bearing location of each roof truss a metal tie-down strap. For energy heel 5/12 trusses H16 Simpson Strong Tie or equal shall be installed on the outside wall before the roof sheathing. Tie-down must lap the top chord of the truss by at least two inches and the top plate of the wall. Provide correct nails and nailing pattern as required by manufacture of tie-down.

VI. WOODS, PLASTICS & ROUGH CARPENTRY

A. FLOOR FRAMING

1. **Floor joists and band joists** are to be #2 KD 2 x 10 SPF spaced 16" o.c. and shall comply with span limitations. All joists, which have more than 1/2" of crown, shall be culled. Engineered floor trusses may be substituted for joists but the builder must furnish the agency with engineered drawings.
2. **Floor joists** should be lapped a minimum of 3" over the center beam. Care should be taken when placing joists to minimize pushing or pulling the outside rim joist (bandboard) which would result in curvature of the sides of the floor deck.
3. **Bearing.** The ends of each joist, beam or girder shall have not less than 1-1/2" of bearing on wood or metal and not less than 3" (76 mm) on masonry or concrete except where supported on a 1" x 4" (25.4 mm x 102 mm) ribbon strip and nailed to the adjacent stud or by the use of approved joist hangers.
4. **Joist framing.** Joists framing into the side of a wood girder shall be supported by approved framing anchors or on ledger strips not less than nominal 2" x 2" (51 mm x 51 mm).
5. **Subflooring to be 3/4" plywood or an engineered floor panel such as AdvanTech or equal, glued and nailed per manufacturer's instructions.**
6. When **concrete porches** are to be poured onto the band joist, that part of the band must be a treated 2 x 10 to at least 2' past the porch in both directions or where wood decks are to be attached.
7. **Drilling and notching.** Structural floor members shall not be cut, bored or notched in excess of the limitations specified in this section.

B. EXTERIOR WALLS

1. Headers on load bearing walls to have two 2" x 10"s supported by one set of 2" x 6" jack studs securely installed beneath them. Headers shall be insulated on interior side with minimum R-5 rigid foam insulation (2 layers of R-3 glued together may be used). Headers shall be setback on the interior side sufficient depth to allow installation of R-5 rigid foam insulation (generally 1" to 1.5 inches depending on insulation used) and insulation shall be visible from inside of house.

2. All exterior walls to be 2" by 6" studs 24" on center and completely covered with exterior wall sheathing. Exterior wall sheathing to be 7/16" OSB or other approved wood. Plywood clips must be used as 1/8" spacing separators and for added strength at sheathing joints. Sheathing to be spaced 1/8" on all sides to allow for expansion per manufacturer's stamped instructions.
3. Walls shall have continuous top plates or sealed blocking using silicone caulk, latex foam or equivalent material.
4. Contractor is to use advanced framing as follows to reduce thermal bridging and allow insulation to meet Energy Star requirements.
5. All exterior corners shall be constructed with three studs per corner to allow access for the installation R-19 insulation that extends to the exterior wall sheathing.
6. Limit framing at all windows and doors. Limit framing to a maximum of one pair of king studs per window opening. Limit framing to a maximum of one pair of jack studs per window opening to support the header and window sill. Install additional jack studs only as needed for structural support and cripple studs only as needed to maintain on-center spacing of studs. Limit framing to necessary structural requirements for each door opening.
7. All interior/exterior wall intersections are to be insulated to the same R-value as the rest of the exterior wall. Insulation shall run behind interior/exterior wall intersections using ladder blocking, full length 2"x6" or 1"x6" furring behind the first partition stud, drywall clips, or other equivalent alternative.
8. Install solid blocking in wall for grab bars in bathroom and bath accessories.

C. ROOF TRUSS SPECIFICATIONS

1. All wood trusses shall conform to **IRC and shall be raised heel or Energy heel trusses with a minimum heel height of 12 inches.**
2. Trusses are to be braced laterally according to the manufacturer's directions. In the event there are no specific directions, start at the top of each gable and install one run of 2 x 4 16-ft. long diagonal across, each purling in the center of the trusses to the top of the bottom cord. Then nail a 2 x 4 (length as needed) to the top of the bottom cord to tie the diagonal 2 x 4 braces together. This is to be installed on both sides of the trusses. The contractor must install two 2 x 4 x 16's from the top peak of each end truss with the brace attached to the web of each truss that it passes. Once these are in place, two 2 x 4s will be attached to these braces and laid flat on the top chords of the trusses, being nailed to each one.
3. Truss members shall not be cut, notched, drilled, spliced or otherwise altered in any way without the approval of a registered design professional (**Section 802.10 IRC**).
4. Roof trusses shall be designed using the following loads: TC Live - 25.0 psf, TC Dead, 10.0 psf, BC Live 0.0 psf, BC Dead 10.0 psf, Total 45.0 psf.
5. Contractor shall submit truss shop drawings including structural calculations signed and sealed by a structural engineer licensed in Kentucky to the Project Manager prior to fabrication.

6. Gable end trusses shall provide 2'x4' flat vertical web members spaced at 16" on center.
7. Gable shall be built-in to counteract dead load deflection for spans indicated.
8. Trusses shall be spaced 24" on center or in accordance with structural engineer's specifications if different.

D. PORCHES AND DECKS

1. See standard porch details when constructing porches. If deck detail is not provided, wood porch or deck shall be constructed in accordance with the American Wood Council's Prescriptive Residential Wood Deck Construction Guide. All entries shall have a minimum stoop, porch or deck of 5' by 5' centered on the exterior door. This platform must be within 1/2" of the interior finished floor at the point of entrance and a maximum threshold rise of 1-1/4" when approaching from the outside. Entry door threshold must not project more than 3/4" above the interior finished floor.
2. Porch or deck may be reduced or eliminated for a secondary entrance which opens into a garage or onto a carport as long as entrance is in compliance with the building code. Front porches are to have footers and foundation continuous with house footer and foundation. Front porch decks are to be concrete with block foundation if finished height at any point is 48" or less. Front porch columns are to be round or square aluminum columns at least 4" in diameter. **All front porch guardrails including guardrails on front stairs and handicapped ramps are to be vinyl, metal or composite material, not treated wood.**
3. **All porch steps are to have a net clear width of 42". All porch steps shall be poured concrete unless otherwise approved by project manager or there are four or more steps. Prefabricated concrete steps are not allowed.**
4. **All porch decks and steps** constructed of wood shall be ACQ (0.25 lbs/CuFt) treated SYP and shall be rated for loads. Joists shall meet KRC span ratings and be fastened to band by approved metal hangers or 2" x 2" ledger strips. The 4 x 4 posts shall not be notched. Band joist shall be doubled and supported vertically by ACQ (0.25 lbs/CuFt) treated) 2" x 4" mounted to post and extending to footer. Decks shall be secured to the band board and rail posts with carriage bolts.
5. Porch ceilings must be sheathed with OSB or plywood before installing vinyl soffit material.
6. **An approved corrosion resistant flashing such as copper or Ice Guard shall be applied where exterior porches, decks or stairs attach to a wall or floor assembly. Aluminum flashing shall not be used.**
7. Wood stairs are to have three 2' by 12" stringers. Stringers must have sufficient attachment at deck floors through the use of ledger plates or metal joist hangers. **Steps shall have solid wood backing. Open stairs are not permitted. Steps shall have a concrete pad formed and poured to support the stair carriage members fully that leaves a 4' by 4' clear landing at the base of the steps.**
8. **Decks.** Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure with bolts and designed for both vertical and lateral loads as applicable. Such attachment shall not be accomplished by the use of toenails

or nails subject to withdrawal. Where positive connection to the primary building structure cannot be verified during inspection, decks shall be self-supporting. For decks with cantilevered framing members, connections to exterior walls or other framing members shall be designed and constructed to resist uplift resulting from the full live load specified in Table R301.4 acting on the cantilevered portion of the deck.

E. HANDRAILS

1. See Section 311.7.8.3 of Kentucky residential code for minimum requirements.
2. All stairways of **three or more risers** shall be provided with a handrail on at least one side (this exceeds the IRC Code). Handrails shall have a minimum and maximum height of 34 inches and 38 inches respectively, measured vertically from the nosing of the treads.
3. **All required handrails shall be continuous the full length of the stairs. End shall be returned or shall terminate in newel posts or safety terminals. Exterior handrails shall be 1 ½" painted pipe or smooth metal handrails, not wood, and mounted using standard handrail brackets. Vinyl, composite or aluminum guardrails with a built in graspable handrail per code may be used instead of the metal handrail and shall be factory made and finished. Materials must be finished with a factory or field applied coating suitable for effective weather resistance.**



Handrail along guardrail



Handrail along ramp

(Note wood guardrails are no longer allowed)

4. Handrails adjacent to a wall shall have a space of no less than 1.5 inches between the wall and the handrail.
5. **Handrail sizes** may range from 1-1/4" diameter to 2" diameter and shall be mounted inside the guardrail structure using standard handrail brackets. See **R311.7.8.3 KRC**. Handrails must support 200 pounds. Handrails shall not rotate within their fittings. Handrails must be returned to the support posts at each end of the run. NOTE: The clear space between handrails on stair systems must be no less than 30". The clear space between the handrail and wall on stairs shall be 2-1/4".

F. GUARDRAILS

1. See Section R312 of Kentucky Residential code for minimum requirements.
2. All porches, balconies or raised floor surfaces located more than 30 inches above the floor or grade below at any point within 36 inches horizontally to the edge of the open side shall have guardrails not less than 36 inches in height. Guardrails may be required on porches with decks less than 30 inches high when deemed necessary by the building inspector or project manager for safety reasons.
3. All guardrails on porches and any handicapped ramp shall be constructed of any combination of metal, vinyl or composite materials and shall be factory made and finished. Materials must be finished with a factory or field applied coating suitable for effective weather resistance. **Treated wood guardrails are not allowed.** All posts and columns at deck level and above shall be factory made and finished. Guardrails are to be 36" high supported by 4" x 4" ACQ (0.40 lbs/CuFt) treated posts set 2' in the ground in concrete. Top and bottom stringers shall have vertical pickets spaced less than 4" apart. Bottom stringer of guardrail is to be less than 4" off the deck and the nose of the stair treads.
4. Open sides of stairs with a total rise of more than 30 inches above the floor or grade below shall have guardrails not less than 34 inches in height measure vertically from the nosing of the treads. Stair guardrails are to meet the same restrictions as well as the small opening at the "V" between the tread and riser of the steps. **The triangular area on stair sides at the tread, riser, and railing may not pass a 6-inch diameter sphere.**
5. Guards shall have infill to prevent accidental falls by providing one or more of the following: Solid wall; railing system with solid infill; railing system with balusters spaced so that a sphere of 4-inch diameter may not pass through.
6. **Guard rails shall be provided at retaining walls with difference in grade level on either side of the wall is in excess of 30 inches and located closer than 3 feet to a walk, designated walking path or driveway on the high side (Section R312.2 KRC).**

G. RAMPS

1. See Section 311.6 of Kentucky Residential code for minimum requirements. All ramps shall be composite material, concrete, galvanized steel or aluminum with non-skid surface. Wood ramps are not allowed. All posts and columns at deck level and above shall be factory made and finished. All structural posts below grade shall have the factory treated end of the post below grade.
2. All egress ramps shall have a maximum slope of one unit vertical in twelve units horizontal (8.3 percent slope). The ramp shall be a minimum clear width of 42" and have a non-skid surface. The maximum rise for any run shall be 30 inches. When it is technically infeasible to comply with the slope due to site constraints, ramps may have a maximum slope of one vertical unit in eight horizontal (12.5 percent).
3. Guardrails shall be provided on the open sides and handrails shall be provided on at least one side of all ramps exceeding a slope of one unit vertical in 12 unit's

horizontal (8.33-percent slope), a rise greater than six inches or a horizontal length greater than 72 inches.

4. A minimum 5-foot by 5-foot landing shall be provided at the top and bottom of ramps, where doors open onto the ramp and where the ramp changes direction.

VII. THERMAL AND MOISTURE PROTECTION

A. SEALANTS

1. All elements comprising the building's thermal envelope, including all exterior joints, seams or penetrations, shall be sealed with solid blocking or flashed as needed and gaps sealed with a 25-year caulk or foam. All cracks in the building envelope are to be fully sealed.
2. All holes in the foundation shall be sealed with 25-year caulking or with mortar on both the inside and outside of the foundation wall.

B. ROOFING

1. Roof Sheathing: Sheathing shall be 5/8" CDX plywood (Section R 803) or 7/16" OSB (Section R803.2 IRC) with a span rating of 24/16 nailed to IRC requirements. Plywood clips must be used as spacing separators and for added strength when trusses are spaced 24" on center. If the rafter spacing is 16" on center, ply clips are not required. Sheathing shall be fastened and installed in accordance with IRC Code.
2. Roof Coverings: Roof coverings shall be installed according to manufacturer's directions. All roof work is to include all necessary flashing and gutters and downspouts along all drip edges. Roof edging shall be pre-painted aluminum, pre-formed. Install one layer of No. 15 asphalt impregnated builders felt, metal drip edge and 3-tab self-sealing, fiberglass based asphalt, strip shingles, owner's choice of color. Shingles to be fastened with galvanized nails. Shingles shall be ULI Class A, a minimum of 235 lbs. per square with minimum 25-year warranty.
3. Flashing: All flashing shall meet the requirements of the IRC. Valley flashing shall be .024 inch thick aluminum or No. 26 galvanized steel and flashing against vertical sidewall shall be by the step flashing method. All vertical projections and vents shall be flashed in accordance with shingle manufacturer's printed instructions.
4. Roof vents shall be continuous formed ridge vents, pre-finished to match the color of the roof or COBRA brand or equal ridge vent material under shingles forming ridge vent. Where there are existing roof vents, additional new vents shall be similar to existing.

C. SIDING

1. Siding shall be lapped, double 4", 0.042 gauge minimum thickness vinyl siding with 20 year warranty, owner's choice of color. Installation to include vinyl corners, J-channels, and starter strips fasten with 1 1/4" galvanized nails when nailed directly to OSB. Wrap all cornice, corner, door and window trim as needed. All soffits and eaves are to have vented vinyl. Installation is to be in accordance with recommendations of the manufacturer.

2. **All walls including gable ends to be wrapped with Tyvek or an equal wrap, installed according to manufacturer's instructions. Capped nail or screw fasteners shall be installed no less than 6" apart and not more than 18" apart. House wrap shall overlap at least 6" at seams in a shingle manner. All seams shall be taped. All windows and doors shall be properly flashed before siding is installed.**
3. **Contractor to provide sample to Project Manager before installing siding.**
4. All porches or carport ceilings shall have solid wood or OSB backing under the vinyl or drywall when required for fire wall separation from the house.

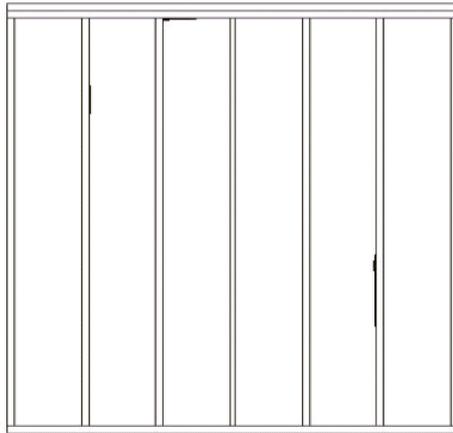
D. GUTTERS AND DOWNSPOUTS

1. Install 5" OGEE seamless, continuous aluminum gutters and aluminum downspouts. Caulk and pop rivet all corners, drops and endcaps. Pop rivet all downspout sections. Nail gutters using aluminum spikes and ferrules into rafter tails at a minimum of 36" intervals.
2. Downspouts to 3" be secured to drop tubes and to be fastened to building with at least two straps or approved hangers per story. All downspouts shall be connected to drain boot and minimum 4" drainage pipe to carry water underground at least five feet away from house to an appropriate, safe outlet point that allows mowing of the lot. All drain pipes shall open to daylight on the owner's lot, an approved storm sewer system or to an underground catchment system at least ten feet from the foundation. When existing conditions prevent installation of drain pipes at end of downspouts, a concrete splash block shall be installed.

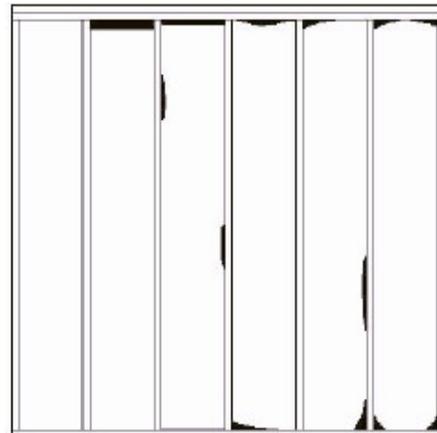
E. INSULATION

1. **Air infiltration rates shall be less than or equal to 5 Air Changes per Hour (ACH50) when tested by a Rater using a RESNET approved testing protocol.**
2. **Reduced thermal bridging at walls shall be provided by R-3 insulated siding or use of advanced framing or other approved method as described in the Energy Star Thermal Enclosure System Rater Checklist.**
3. A permanent certificate shall be posted on or in the electrical distribution panel. The certificate shall be completed by the builder and shall list the predominate R-values of insulation installed in or on the ceiling/roof, walls, foundation, and ducts outside conditioned spaces; U-factors for fenestration, and the solar heat gain coefficient value for each component. The certificate shall list the type and efficiency of heating, cooling and service water heating equipment.
4. Tyvek or approved equal house wrap shall be applied on all exterior walls including gable ends.
5. Insulation shall fill all spaces equally to specified R-value. **Per the building code, measuring markers are to be installed in the attic towards the attic opening to show depth of insulation. Minimum required R-values are R-19 in 2x6 walls, R-13 in 2X4 walls, R-30 under floors where required and R-49 in attic spaces.** Wall batt insulation shall be unfaced. No interior vapor barrier is required in the wall. Attic insulation shall be blown in cellulose insulation to be a minimum of 12 inches deep

or blown in fiberglass cubes a minimum of 15” deep for R-38. Insulation shall be full depth to exterior wall. Insulation shall achieve Grade I installation per RESNET Standards or Grade II if R-3 insulation is installed in exterior siding. Attic insulation is to extend to the full depth to the outside wall line. Attic access to have a minimum 12” high frame access area (15” if fiberglass cubes are used) and one layer of R-38 paperfaced batt insulation the same size as the opening cover and glued to the back of opening cover and a white foam weather stripping gasket.



GRADE I INSULATION



GRADE II INSULATION

6. Install air infiltration baffles between all trusses to provide adequate passage of outside air in the attic. Baffles are to be plastic or Styrofoam forms made for that purpose, not cardboard or PVC piping. The top of each baffle must end at least one inch above the required depth of the insulation and the insulation shall not block the ventilation path at edges. Baffles may not be required if exterior wall sheathing extends at least 12 inches above the exterior wall to contain insulation and an unblocked air gap remains between the sheathing and the roof.
7. Under floor insulation, where required, shall be held in place with wire keepers, the vapor barrier is to be on the heated side of the house.
8. **Crawl spaces shall be closed with no foundation vents. Interior of crawl space wall shall be insulated with R-10 closed cell polyurethane spray foam insulation over the vapor barrier. Insulate back of crawl space access door. Insulate the band joist to R-10.** All foam insulation shall meet the requirements of Section R314 of the International Residential Code for thermal barriers, flame spread and ignition barriers. **Ignition barriers are required in a conditioned crawl per the building code unless documentation that the spray foamed used does not require an ignition barrier when used in a conditioned crawl space is provided to the project manager.**
9. **Water lines in unconditioned spaces** shall be insulated with foam pipe insulation including elbows. Water lines in conditioned crawl spaces do not have to be insulated.
10. **A 6-mil thick polyethylene vapor barrier** shall be applied to the crawl space over gravel to form a moisture barrier. The sides shall extend **to within 3 inches of the top of the masonry wall. Seal the top of the vapor barrier to the wall with duct**

mastic, foam insulation or equivalent sealant. Extend vapor barrier up the interior columns and seal at top of column with mastic or foam insulation. All joints in the plastic to be lapped a minimum of six inches and be sealed with fiberglass mesh tape and mastic or equivalent. Seal vapor barrier around all plumbing or other penetrations through wall. Mechanically seal the vapor barrier to the ground as necessary.

Concrete basement walls shall have a minimum R-13 continuous fire rated insulation with white finish such as Thermax or equal. Insulate the band joist with R-30 insulation extending to the outer edge of the foam insulation. Stud walls with R-13 insulation and sealed drywall may be used instead of thermal insulation board. When there are framed walls in the basement, they shall be insulated to R-19 for six inch walls and R-13 for four inch walls (adjacent to concrete walls).



Fire rated insulation in basement

VIII. WINDOWS AND DOORS

A. EXTERIOR DOORS

1. **Front exterior doors are to be owner's choice of solid six panel with a viewer installed at height approved by owner or ½ light.** Exterior doors for 2 x 6 walls must have extended jambs and be designed for 2 x 6 walls. Rear or side exterior doors are to be owners choice of ½ light or full light doors. All exterior doors to be three foot wide with a net clear opening of 32", pre-hung, minimum of 1 ¾" thick, insulated steel with lever type lockset and deadbolt keyed alike (Titan, Quickset or equal). **Exterior doors without windows or ½ light windows are to have a minimum U-Factor of 0.27 or less and a solar heat gain coefficient (SHGC) of 0.30 or less. Exterior doors without windows in houses with basements are to have a minimum U-Factor of 0.16. Exterior doors with windows (more than ½ light) are to have a U-Factor of 0.32 or less and a SHGC of 0.30 or less.** Installation of doors includes all necessary prep, trim, doorstops, hardware, weather-stripping, opening preparation, primer and **two coats of latex enamel paint on all six sides (remember that any plastic window trim on exterior doors must receive two coats of light colored latex enamel paint).** Any necessary jamb extensions are to be factory jams and installed at the exterior edge under the brickmold. A minimum of 5 foot by 5-foot landing shall be required on each side of an egress door. Exterior

landings shall be centered on the door. **Landings shall not be more than 1 ½” below top of threshold (no exceptions).**

2. All entry doors shall be equipped with a brass plated, or other durable metal finished, key lock lever type handle and deadbolt.
3. Latches, handles and hinges shall be metal with polished or brushed finish. Plastic handles and latches are not acceptable.

B. STORM DOORS

1. **Storm Doors - It is recommended that storm doors open away from prevailing winds. Contractor shall confer with owner as to direction door shall open before installing storm door.** Storm doors shall be minimum 1” thick aluminum with maintenance free baked-on enamel finish or maintenance free vinyl over 1’ solid wood core (Larson Hampton Midview Storm door or equal). Full or midview screen doors shall be used when solid or full light exterior doors are used. Screen doors may be ½ light screen doors for ½ light exterior doors.
2. Doors shall be provided with full weather-stripping and vinyl sweep and shall have built-in drip cap at head. Sweep shall be adjusted to block air leakage under door. Storm panel shall be glazed with clear, tempered safety glass. Screen shall include nylon insect screening, securely attached. Provide heavy duty pneumatic closer on each storm door.

C. INTERIOR DOORS

1. Interior doors are to be split jamb, hollow core, raised panel hardboard, 1 3/8” thick. Doors are to be equipped with three hinges and door stops. **Edges shall be sanded prior to painting. Doors are to be painted on all six sides.** All new passage doors from room to room including bedroom doors and bedroom closet doors shall be a minimum of three feet wide with a net clear opening of 32”. **Interior bedroom and bathroom doors are to be provided with appropriate privacy locks and must have lever type brass-plated or other durable metal finished door hardware.** Interior doors shall clear finished floors by ¾” to allow air circulation under the door. Doors shall not drag on carpeting.
2. All doors are to have door stops (installed in baseboard when possible).
3. Utility closets with heat pump hot water tanks shall have a louvered door or similar ventilation as required by manufacturer.

D. WINDOWS

1. All windows and doors installed in the building thermal envelope shall be fully flashed according to the manufacturer’s instructions. Include pan flashing at sills, side flashing that extends over pan flashing, and top flashing that extends over side flashing. **All rough openings around windows and exterior doors shall be sealed with caulk or foam. Wrap house wrap around sides and bottom of openings and secure inside of house. A house wrap tab shall be cut above window and taped down over flange and window flashing.**

2. Windows installed adjacent to stairways, landings and ramps within 36 inches horizontally of a walking surface when the exposed surface of the glass is less than 60 inches above the plane of the adjacent walking surface or other hazardous locations shall have safety glazing in compliance with IRC.
3. Windows to be good quality double hung, double glazed (thermopane), vinyl sash and frame with aluminum screen frames and without grilles (preferred) with **LoE glass or equal. Windows to have a U-Factor of 0.30 or less and a SHGC of 0.40 or less.** The vapor seal on the glazing shall have a minimum ten year warranty. All windows shall have a one year warranty on the operation of the window. Screening material to be fiberglass, nylon or aluminum. Weather stripping to be compression type vinyl. **Window sample and documentation that bedroom windows meet egress standards to be approved by Project Manager prior to installation. Window stickers documenting the thermal rating of the glass shall be on the window and not removed until just before final inspection.** Windows shall have built in or installed handles to allow easy opening. Windows with narrow strip in middle of window for opening ledge are not allowed. Windows shall tilt in for cleaning. Include all necessary hardware, trim and finish. Windows must meet the ANSI/AAMA 101-93 standard. **Bedroom windows must have minimum net clear opening of 5.7 square feet or 820.8 SQ. IN. Window stickers documenting the thermal rating of the glass shall be on the window and not removed until just before final inspection.**
4. Exterior window and door trim wrap shall be 19-gauge coilstock aluminum. Caulk all seams and joints with 25 year silicone caulk. Door trim to be finger jointed pine.
5. Windows are to receive a wood bottom sill on the inside only with colonial style finger jointed trim beneath the sill (**the ends of the trim should be cut at a 5-degree taper**). The remaining three sides of the windowsill are to be finished with drywall and vinyl J channel. Contractor may finish window openings with painted or stained wood. Wood trim shall be of good quality, smooth material free of knot holes and defects. The windowsill and trim are to be primed and then receive two (2) coats of latex semi-gloss enamel paint. They may also be stained and sealed with two coats of polyurethane. The remaining three sides shall be painted to match the walls.

IX. FINISHES

A. GYPSUM DRYWALL

1. Install drywall only after framing, wiring, plumbing and insulation have been inspected. **Project manager must have copy of building inspector's written framing inspection report prior to payment for framing.**
2. **Hallways – All hallways shall have a net clear opening (finish wall to finish wall) of 42". Definition of a hallway is any passageway that is 18" or greater in depth.**
3. Drywall shall be a minimum of ½ inch thick, taped and sanded to a smooth surface. Drywall is to be sealed to top plate at all attic/wall interfaces using silicone caulk, latex foam, or equivalent material. Construction adhesive shall not be used. Drywall is to be installed with drywall screws, not nailed. **When using trusses spaced 24 inches on center you must use 5/8-inch drywall on ceiling with dry wall screws**

spaced 7 inches on center or ½” sag-resistant gypsum ceiling board. Use water-resistant drywall (green board) **in entire bathroom except ceiling**, in laundry room behind washer hook-up, and behind sink in kitchen and around water heater (areas within six feet of utility hook ups). **When a bathtub or shower is located on an exterior wall, that wall must be insulated and then sheathed with green board before setting the tub/shower unit.** Install corner bead on exposed drywall corners and J-bead as necessary for proper drywall edge finish.

4. Where partition walls meet other partition walls or exterior walls, “t”s are to be constructed for proper backing for drywall unless sheetrock wall clips are installed per manufacturer’s instructions. If “t”s are constructed, the structural material shall not block the exterior wall area so that insulation can be installed between the “t” and the exterior wall sheathing.
5. Provide minimum 22 inch by 30 inch attic access. **Door opening is to be built up with minimum 12” framing between the trusses so that no insulation spillage will occur when attic access panel is removed.** Access panel is to be 5/8” drywall, fumed, painted and insulated with one layer of R-38 fiber glass batt glued to the attic side of the door. Attic access panel is to have a white foam weather stripping gasket. **Attic access shall be located in a hallway or other readily accessible location. Attic accesses are not permitted in closets.**
6. Unless otherwise noted, all drywall is to be trimmed with good quality softwood trim (finger jointed pine). Vinyl trim with preformed corners may be used in kitchen and bathroom. **If trim is caulked, silicone caulk is to be used, not latex.** Nail holes and depressions must be filled prior to painting.

B. PAINTING: INTERIOR AND EXTERIOR

1. Painting is to include all necessary prep work to provide proper adhesion, stain blockage, uniform coverage and smooth appearance. Exterior painting also includes caulking of window and door frames, siding abutments or other joints or seams which would allow air infiltration.
2. When painting adjacent to glass, scrape glass clean before painting. Glass is to receive an eighth inch paint bead for proper seal. If excess paint has to be scraped off windows, the seal must be painted.
3. Ceilings are to be smooth finished and painted or may be light textured finish of latex material (latex paint mixed with texture compound).
4. Unless otherwise specified the following types of paint will be used:
 - a) All interior trim - washable latex enamel semi-gloss.
 - b) Interior walls and ceilings - latex satin (low-luster) finish (washable).
 - c) Exterior wood - latex semi-gloss.
 - d) Metal - rust resistant enamel.

5. All painting called for includes one coat of latex primer and two complete coats of paint.
6. Proper precautions should be taken to prevent paint from getting on unpainted surfaces. Any mishaps should be removed immediately. The contractor is responsible for any damage caused by stray paint or other finishes. Spray painting of interior is not allowed.
7. New interior Walls are to be owners choice of white or antique white (**provide paint chips with other samples for owner to select white color**). For walls with existing paint, paint to match existing color unless otherwise noted. Contractor is to leave at least one quart of each type of paint with homeowner for touch up work. Owner is to choose exterior color for doors and shutters. Outside of exterior doors to be painted to match shutters unless specified otherwise in special conditions. Interior side of the exterior door to be painted white to match interior trim.
8. Contractor shall comply with CFR, Title 24, Sub-Part C, 35.25 concerning Lead-Based Paint Standards. Lead-based paint will not be used.

C. FLOOR COVERING

1. **Carpet and vinyl samples are to be provided to Project Manager for approval prior to installation.** Install vinyl flooring in kitchen, dining area or dining room, bath and 16 square feet at front door and all other exterior doors. Vinyl flooring and underlayment shall extend wall to wall under cabinets unless bottom cabinets are not removed during rehabilitation. Install carpet in remainder of house unless noted otherwise in special conditions. Flooring shall be laid by a professional flooring installer and properly glued and nailed and seams sealed. All surfaces shall be clean, dry and appropriate temperature during installation.
2. Thresholds shall be aluminum. Baseboards are to be finger jointed pine, painted with one coat of primer and two coats of latex enamel. Cut all corners to fit, do not use filler. Install primed and painted quarter round where necessary to insure vinyl or carpet is properly anchored at baseboards, tubs or door casings.
3. **Vinyl flooring shall be Luxury Vinyl Tile (LVT) click and lock vinyl planks minimum size of 12" by 36" meeting ASTM F10667 with a minimum thickness of 0.125 inches. Owner's choice of color and style. LVT tiles may be used when only the bathroom and kitchen have vinyl flooring. Floor cover shall have at minimum 25-year residential warranty.**
4. Underlayment shall be ¼" luan or as recommended by manufacturer of vinyl (no particleboard). Underlayment may be fastened down with 1" long staples or nailed with 1-1/4" ring shank nails. Fill over nail dents and fill cracks in accordance with manufacturer's recommendations. Sand filler and clean floor.
5. Vinyl shall be glued and laid smooth (too much glue causes lumps) and fit neatly against tub, baseboards and door casings. Vinyl must be laid under commodes with new wax ring. Joints in vinyl must be sealed and edges of vinyl must be caulked at tubs and door casings. Install primed and painted quarter round where necessary to insure vinyl is properly anchored at baseboards, tubs or door casings. Metal edge strips shall not be used, except at joints with dissimilar floor covering.

6. **Carpeting:** A professional carpet installer shall lay all carpet. Carpet shall comply with FHA or HUD standard UM-44-d. **Carpeting must meet the product testing requirements of the Carpet and Rug Institute's Green Label Plus program.** Install over a ½" thick, 6-lb. minimum re-bond polyurethane pad with a minimum of seams. Include tackless strips, metal edge strips, and mending tape to cover entire floor including closets. On stairs, fasten carpet and pad at top and bottom of each riser. Carpet and pad should be of good quality, 25 oz. minimum 100 percent nylon. Owner's choice of color and pile (one color per house). Trim usable scraps and leave with owner. Carpet shall have a 5-year wear warranty. Contractor may provide Berber type carpeting with blended fiber as an option to the homeowner in addition to nylon cut-pile carpeting. **Carpet samples must first be approved by project manager.**
7. Interior doors shall clear finished floors by ¾" unless otherwise noted.
8. **ADA Compliant Carpeting:** Carpet shall be securely attached and shall have a firm cushion, pad, or backing such as a froth or rubber carpet pad. Carpet shall have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. Carpet shall be 30 oz. minimum. Pile height shall be ½ inch (13 mm) maximum. Exposed edges of carpet shall be fastened to floor surfaces and shall have trim on the entire length of the exposed edge. Carpet edge trim with changes in level of ¼ inch (6.4 mm) high maximum shall be permitted to be vertical. Changes in level between ¼ inch (6.4 mm) high minimum and ½ inch (13 mm) high maximum shall be beveled with a slope not steeper than 1:2.

X. SPECIALTIES

A. BATH ACCESSORIES

1. Each bathroom is to be provided with wood or metal paper holder, robe hook on back of door, one 18" towel bar (or hand towel loop) and one 24" towel bar (install at 48" height) and adjustable shower rod. Towel racks shall be mounted at maximum height of 48". Accessories shall be solid, substantial, easily cleaned and free from defects, which would detract from their appearance or utility. **When walls are exposed, contractor shall install proper blocking in wall where accessories are to be installed.**
2. **Medicine Cabinet: When required, install 36" or 30" wood surface mounted medicine cabinet over sink with mirror on front. A 36" or 30" decorative light bar shall be installed over medicine cabinet. Lights may be integrated into cabinet. Medicine cabinet and light bar are to be same width as vanity.**
3. All medicine cabinets, bathroom sink cabinets and light bars above sink are to be 36" unless otherwise noted. If cabinet is reduced to 30", medicine cabinet and light bar are to be 30".

B. MAILBOX

1. All homes served by the U.S. Postal Service shall have a mailbox installed per U.S. Postal Service Regulations.

2. For homes with delivery to front door install a minimum 15" x 6" x 4" deep painted galvanized steel U.S. Postmaster approved mailbox on the front porch near the front door **centered at a maximum height of 48" above floor.**
3. For homes with rural or curbside side mail delivery which do not have an existing mailbox in good condition which meets postal standards, install a U.S. Postmaster approved large (minimum 8" x 10" x 21") painted galvanized steel mailbox on a properly anchored treated wood or metal post. The house or box number must be on the mail box in contrasting letters at least 2 inches tall. **Install the mailbox with the bottom of the box at a vertical height of between 41-45 inches from the road surface.** Boxes must be on the right-hand side of the road and with the box number visible from the carrier's direction of travel. The mailbox should be set back 6 to 8 inches from the front face of the curb or road edge to the mailbox door.
4. Owner may choose to provide a postal service approved mailbox of their choice to be installed by contractor.

C. STREET ADDRESS

1. Install street number of house on front of house in a protected location where clearly visible from road. All numbers must be Arabic numerals at least 4 inches high and ½-inch stroke. Characters shall be of contrasting color in relation to the background on which they are installed. Numbers are to be painted wood or rust proof metal and properly secured with nails or screws. Stick on numbers are not acceptable. House numbers are to meet any applicable local 911 service regulations if more stringent.

XI. EQUIPMENT

A. KITCHEN EQUIPMENT

1. Refrigerator: When required, furnish and install minimum 18 cubic foot freestanding **Energy Star rated** white frost free electric refrigerator/freezer without icemaker. Must have adjustable shelves, door handle and bottom splash cover. Acceptable brands are Whirlpool, LG, General Electric, Frigidaire, and Kitchen Aid. **Refrigerators are to be Energy Star rated. Contractor to provide documentation of Energy Star rating prior to payment for this item. Refrigerator doors to have door handles on countertop side. If contractor elects to install a refrigerator with an ice maker the ice maker is to properly plumbed and operational.**
2. Ranges: When required, furnish and install one freestanding white and/or black gas or electric 30" range as noted in Special Conditions. Gas ranges shall have automatic pilotless ignition. Electric ranges shall be self-cleaning, white and/or black. Acceptable brands are Whirlpool, LG, General Electric, Frigidaire, and Kitchen Aid. **Safety bracket for range shall be installed by the contractor. Wall plug for the range shall not prevent range from aligning with cabinets.**

3. Range hood: **Provide and install Energy Star Rated range hood** with minimum 150 CFM fan **rated at ≤ 3 sones** and light (color to match range) at over range location. The ENERGY STAR mark must be clearly displayed on the front/inside of the product, in product literature (i.e., user manuals, spec sheets, etc.), and on the manufacturer's Internet site where information about ENERGY STAR qualified models is displayed. Range hood is to be vented to exterior of building. Use duct size and material per manufacturer's recommendations. Provide a finished cover over exposed ducting.
4. **Dishwashers: Special conditions will specify if owner is to provide dishwasher for contractor to install. Contractor is to provide all necessary electrical and plumbing connections to code. All dishwashers are to be Energy Star Rated. If special conditions do not specify that a dishwasher is to be provided by contractor or homeowner, install a cabinet in location of dishwasher instead of dishwasher.**

B. BATH/KITCHEN FIXTURES

1. Kitchen sinks are to be double bowl, stainless steel units with 8" deep x 33" x 22" bowls, self rimming. ADA compliant kitchen sinks shall be 6" deep. Sinks are to be installed with new metal basket strainers. Seal rim at countertop with silicon. Contractor is to provide sample of countertop to Project Manager prior to installation.
2. **All faucets shall be single lever, quality metal** Delta washerless faucets or equal. **Plastic or acrylic levers are not acceptable.** Kitchen faucets shall include a spray assembly. Tub faucets shall be scald guard tub and shower combination valves. All faucets shall be installed with shutoffs.
3. **All toilets shall be centered a minimum of 18" from any corner wall, base cabinet or tub.** All toilets installed shall be a complete assembly, which includes a new seat, supply line, shutoff, wax ring, and closet bolts. **Toilets are to be 1.28 gpf** or less and one of the following brands: American Standard, Kohler, Crane, Elgier or Mansfield.
4. When accessible toilets are specified, the top of the toilet seat shall be between 17 and 19 inches from the floor.
5. **Lavatories shall have a 30" by 48" clear floor space. The clear floor space may be rotated or angled, depending on approach and design. In a side approach, the 48" dimension shall be parallel to the lavatory. In a forward approach, the 48" dimension shall be perpendicular to the lavatory. The bowl shall be centered in either the 30" or 48" dimension. The clear area shall be free from all wall projections, tub, shower, toilet or lavatory base.**
6. Handicapped accessible lavatories, when required by the special conditions shall be mounted with the rim or counter surface no higher than 34" above the finished floor. Provide a clearance of at least 29" from the floor to the bottom of the apron. Hot water and drainpipes under lavatories shall be insulated or otherwise covered.
7. Lavatories shall be counter type vitreous china, 19" by 17". White synthetic marble ready-formed counters with integral lavatories may be used in bathroom in place of plastic laminate top. Counter tops shall have integral backsplash. Seal backsplash at wall with silicone. Include sealed sidesplash at any sidewalls.

C. WASHER & DRYER HOOKUPS

1. Washer/dryer hook-ups shall be in a plastic wall mounted box with proper finish face cover installed. Washer hose shut-offs are to be one-quarter turn ball type.
2. Clothes dryer exhausts are to be installed in accordance with **Section M1502 IRC**. **Dryer vent material** passing through walls will have a metal thimble through the wall to the exterior hood and to be connected to the dryer. Dryer vents that pass through and under the floor before exiting the foundation wall will be galvanized, single-wall type ducts beginning with an elbow extending up through the floor and ending at the exterior mounted vent hood. All under-floor ducts will be level to slightly sloped away from the dryer and properly fastened to the floor system. **All fixed vent material beyond the dryer must be of rigid metal.** Flexible transition ducts used to connect the dryer to the exhaust duct system shall be limited to single lengths, not to exceed 8 feet (**M1502.4 IRC**). Use a screw-type clamp to make connections. O screws may be used to connect the flex duct to rigid metal duct. **Flexible plastic or foil ducts are not allowed.**

D. BATHTUBS/SHOWERS

1. All tubs installed shall be fiberglass or stamped steel 60" X 30" x 72 units with new chrome on brass waste and overflows. Tub surrounds for stamped steel tubs shall be vinyl or fiberglass and must contain integral molded soap dishes unless windows or other surface irregularities would make the use of tub surrounds with integral molded soap dishes impractical. If fiberglass tubs are used, their tub walls must match the tub's color. A two-piece fiberglass tub is one that has matching fiberglass tub walls that are produced by the same manufacturer. Bottom is to be skid resistant. Insulate between tub and exterior wall. If bathtub/shower is on exterior wall, the wall behind the tub and surround must be sheathed with moisture resistant drywall before setting the tub.
2. Provide shower head and single lever type metal handle (not acrylic). Bath/shower faucets are to be anti-scald type. Provide adjustment directions to owner.
3. **If the tub or shower does not come with preinstalled grab bars, install 2" thick wood blocking, plywood or other approved material for future grab bars in the tub and shower area. The wall reinforcement shall be located 33" to 36" above the finished floor. Install two grab bars in each bathtub or shower per universal design requirements. Tub/shower unit shall have a flat area between 33" and 36" to allow for installation of grab bars. Tubs are not to have curved areas where grab bars are to be installed which prevent proper anchoring and use of the grab bar.**



Four Foot Shower with two grab bars

4. Accessible bathtubs shall be ADA Compliant with factory installed reinforcement, ADA compliant grab bars (white grab bars preferred) and ADA compliant folding tub seat with accessible shower head.



ADA Compliant Bathtub

5. Accessible shower head: A shower spray unit with a hose at least 60" long that can be used as a fixed showerhead or as a hand held shower shall be provided. If specified in the special conditions, the shower spray unit shall be attached to a metal bar which allows the user to adjust the height of the shower head.

XII. FURNISHINGS

A. CABINETS

1. Cabinets shall be Merillat, "Sutton Cliffs Oak"; American Woodmark "Oak Grove" or equal. **Only solid wood front frames, drawer and door fronts are allowed.** Cabinets shall be Kitchen Cabinet Manufacturer's Association (KCMA) Approved and contain the KCMA Label. Install blocking for upper cabinets during framing. Unless otherwise specified, wall cabinets should be nominal 24" to 30" wide with finished height of 36" with 12" shelves. Base corner cabinet shall be lazy Susan type. Base sink cabinet to be 36" wide. Other base cabinets to be nominal 24" wide. Install blocking for wall cabinets. All cabinets to be pre-drilled and installed to wall blocking with pan-head screws (**do not use sheetrock screws**). Cabinet ends to be finished with appropriate veneer. Install loop type pulls (not knobs) if required by door and drawer design. **Loop handle pulls shall be used on any drawers, pull open doors or cabinet doors. – no knobs.**
2. **Contractor is to provide a sample to Project Manager before installing cabinets.**

B. COUNTERTOPS

1. Countertops shall be plastic laminate bonded to minimum $\frac{3}{4}$ " plywood or particle board with 4" integral molded roll-backed backsplash (Formica or Wilsonart or equal, owners choice of standard colors), unless otherwise noted. Include side-splash at any sidewalls with 12 inches of sink. **Caulk any sidewalls near sinks, do not caulk the countertop the rear wall.** Countertops installed on kitchen islands or to be used as a bar top shall have rounded or beveled edges and corners.
2. Seal cut out for kitchen sink. Apply a bead of silicone caulking around the perimeter of the sink where it meets the counter to seal any gaps.
3. White synthetic molded sink tops or recycled glass sink tops may be used in bathrooms.

C. ADA COMPLIANT COUNTERTOPS AND CABINETS

1. The sink and countertops shall be mounted at a maximum height of 34". The depth of the sink bowl shall be no more than 6 $\frac{1}{2}$ ".
2. Kitchen cabinets mounted above work counters shall be 16" above countertop. Door handles for wall cabinets shall be mounted as close to the bottom of the cabinet as possible. Door handles for base cabinets shall be mounted as close to the top of cabinet doors as possible.
3. Knee spaces under cooktops shall be insulated or otherwise protected on the exposed contact surfaces to prevent burns, abrasions or electrical shock. The location of controls for ranges and cook tops shall not require reaching across burners.
4. Bottom cabinets shall have rollout wood shelves.

D. CLOSET STORAGE/ACCESSORIES

1. Linen closets and pantries shall have a minimum of three shelves spaced no closer than 12" apart. Bottom shelf shall be 18" to 24" above floor and topmost shelf shall be no more than 74" above floor. One five foot long utility shelf is to be installed in the utility room over the washer and dryer at a height of 62 inches above the floor. All shelves should support a 200-lb load.
2. **Clothes closets shall contain a minimum of one wood or metal clothes rod and one 12" deep shelf not over 74" above the floor.** The shelf and rod shall support a 200 lb. load with vertical deflection not to exceed 1/4". Not more than one intermediate support may be provided for rods and shelves from 3 to 4 feet in length. Shelving shall be 3/4" pine, B or better or 3/4" plywood-edged with screen mold. Coated wire shelves with clothes rod may be used if they meet the above standards.

XIII. SPECIAL CONSTRUCTION

A. STORAGE SHED

1. When required, storage shed shall be a minimum of 8' by 12' with 8' high walls with 4" concrete floor with sloped entrance to door. **The door shall be double 2' 8" doors, 6' 8" pre-hung, minimum 1 3/4" thick insulated steel doors with lever handled lockset and deadbolt lock. All storage buildings shall be located in rear yard a minimum of ten feet from the house or any property line unless otherwise approved by project manager. All outbuildings shall meet local zoning requirements.**
2. All storage buildings shall have 2" by 4" walls, 16" on center with 7/16" OSB Board wall sheathing. Exterior walls shall be covered in vinyl siding to match house. Storage sheds shall have a gabled, shingled roof to match house with minimum 5 to 1 slope. Metal buildings are not permitted.
3. Bottom plate of storage shed shall be treated wood. All other wood shall be treated wood or the storage building shall be pre-treated for termites.
4. Steps shall be installed as needed to meet code when a sloped entrance cannot be provided due to site conditions.



XIV. PLUMBING

A. PLUMBING STANDARDS

1. All plumbing is to be installed under the supervision of a Kentucky licensed master plumber in accordance with Kentucky Plumbing Code and shall be inspected and approved by the state plumbing inspector prior to usage.
2. The contractor shall provide and post all permits. It is the contractor's responsibility to make sure the state plumbing inspector places rough-in and final plumbing inspection stickers in a visible location as proof of compliance.

B. WATER HEATER

1. Gas hot water heaters shall be ENERGY STAR Qualified High-Efficiency Gas Storage Water Heaters with an EF of 0.67 or higher. Instantaneous gas water heaters shall have a EF of 0.82 or higher.
2. Electric water heaters are to be electric ENERGY STAR Qualified Heat Pump Water Heater with an Energy Factor at least 2.0 or more have a minimum six year warranty unless otherwise specified. Furnish and install hot water heater with temperature and pressure relief valve with discharge tube drained to outside of structure in safe location or a floor drain if located in a basement. Unit shall be installed in accordance with manufacturer's instructions with a 7" clearance on the front and back of the unit to allow servicing of unit. Provide all electrical and plumbing connections to hot water heater. Plumbing and electrical connections shall be installed in a manner to allow removal of air filter



and opening of top of unit. Provide a dedicated interior wastewater standpipe drain for the condensation line and overflow line. Overflow drain tube may drain to a pan under the unit with a plumbed drain. There must be a water shutoff on the cold water supply to the heater. Install pressure reducer as required by local conditions.

3. If special conditions call for a hot water heater other than a heat pump hot water heater, electric hot water heaters are to be Energy Smart with four owner selected modes, have a EF of 0.93 or higher and a minimum eight year warranty. Gas hot water heaters shall be **ENERGY STAR Qualified High-Efficiency Gas Storage Water Heaters with an EF of 0.67 or higher.**
4. Water heaters shall be 50 gallon capacity unless otherwise specified or larger size is required to meet Kentucky State Plumbing Code. Two bedroom homes may have a 40 gallon capacity tank.

C. WATER/SEWER LINES

1. **Drains** are to be of PVC.
2. Water supply piping for potable water systems may be installed with any material specified in Section 10, 815 KAR 20:120, Water Supply and Distribution of the most current Kentucky State Plumbing Law, Regulations and Code. Installation of new lines shall include shut off valves in the house. Water lines in unconditioned spaces shall be insulated with foam pipe insulation including elbows.
3. **Water supply piping is prohibited in exterior walls.**
4. Hose bibs shall be frost-proof **metal hose bibb** (not plastic). As per Kentucky Plumbing Code, hose bibb shall be equipped with an accessible stop-and -waste-type valve inside the building.

XV. HVAC

1. HVAC contractor is to design and install a ventilation system that meets ASHRAE 62.2 – 2010 requirements. HVAC contractor is to design HVAC system according to ACCA manuals. HVAC contractor is to complete field tests and inspection of installed system and complete required checklists.
2. All homes are required to have automatically controlled whole house ventilation that is ducted to the outside and capable of delivering fresh air in accordance with ASHRAE Standard 62.2-2010 (i.e., the minimum ventilation is determined by the following formula: $CFM = (0.01 \times CFA) + (7.5 \times OCC)$ where CFA= Conditioned Floor Area and OCC= number of occupants = number of bedrooms +1). Documentation of the ventilation system type, fan model number, location, design rate and frequency and duration of each ventilation cycle shall be provided prior to final payment for HVAC system. The following types of systems are acceptable:
 - a) Install a high efficiency bathroom exhaust vent with ECM (Electronically Commutated Motor) rated at ≤ 1 sone such as the Panasonic Whisper Green,

Broan Ultra™ Series or equal to provide required continuous minimum ventilation. Vent shall have a fan mounted continuous ventilation control with delay timer and wall mounted spot control switch.

- b) HVAC integrated systems, only if the air handler has a fan that is run by an electronically controlled or brushless DC motor (“ECM”). System shall provide outside air to the return air duct and include a motorized damper and a controller mounted on or near the air handler. Location of fresh air inlet to be approved by project manager.
 - c) HRV (Heat Recovery Ventilation) or ERV (Energy Recovery Ventilation) systems.
3. HVAC system is to be designed to provide supply air to the conditioned crawl space. Provide a backflow damper and either a balancing damper or constant airflow regulator to control airflow in crawl space. Provide conditioned air supply sized to deliver at a rate equal to 1 cfm (0.47 L/s) for each 50 ft² (4.7 m²) of under-floor area, including a return air pathway to the common area (such as a duct or transfer grille), and perimeter walls insulated in accordance with Section N1102.2.8. Both the supply duct register and the return register in the crawl space shall have grills which can be easily controlled by the occupant.
4. **Furnaces to be installed on first floor of house unless otherwise approved by project manager. If the house has a basement, the furnace is to be installed in the basement. Furnaces are not to be installed in the attic, crawl space or exterior of the house. New supply duct work is to be installed in the conditioned crawl space or the basement. Returns are to be installed in the wall near the floor. Building cavities are not to be used as supply or return ducts. All ducts in unconditioned spaces shall have R-8 insulation or higher. Total duct leakage shall be 6 CFM25 or less per 100 sq. ft. of conditioned floor area. Duct leakage to outdoors shall be 4 CFM25 or less per 100 sq. ft. of conditioned floor area. There shall be a return from each bedroom as well as the kitchen/living room area. Alternatively, a Tamarack Technology Perfect Balance door return air pathway or equal may be installed in each bedroom door. Doors may not be undercut to achieve air balancing.** Furnace filters are to be MERV 6 or better and washable and in furnace itself or on the wall near the floor and to be accessible to owner without the use of tools. Filter access panel shall include a gasket or comparable sealing mechanism and fit snugly against the exposed edge of the filter when closed to prevent bypass. **Furnace filters are not allowed in the ceiling.**



Tarmack Perfect Balance Return Air Pathway

5. Heating systems shall be installed by a licensed HVAC contractor. All heating and cooling equipment shall be Energy Star qualified. **Central air conditioners are to be Energy Star certified and have a SEER rating of 15 or higher. Air source heat pumps shall be Energy Star certified and have a minimum HSPF of 9.0; 15 SEER and 12 EER with electrical backup.** Dual fuel air source heat pumps shall have a HSPF of 9.0 or higher, 15.0 SEER and 12 EER with Energy Star qualified dual-fuel backup. **Gas furnaces shall have a minimum AFUE of 92%. Oil furnaces shall have a minimum AFUE of 92%.** Air units are to be the same brand and a matched set to the heating unit. Outside HVAC units are to be on level concrete pad at least 4" thick.
6. **Thermostats are to be programmable. If a heat pump is installed in the unit, a programmable thermostat specifically designed for heat pump systems must be utilized. Homes equipped with heat pumps which have programmable thermostats shall be required to use "adaptive recovery" technology in order to prevent excessive use of electric back-up heating. Thermostats are to be centered at a maximum height of 48" above floor.**
7. **When house has a basement with insulated walls, HVAC unit is to be sized to heat and cool the basement area in addition to the remainder of the house.**
8. Condensation drain lines are to be run outside of house not under crawlspace and are to drain away from the house, not into a vent well or crawlspace access area. On exterior units, drain line is to extend past concrete pad and drain away from the house. **If water accumulates around the foundation under the drain line opening, provide a splash block or other means to direct the water away from foundation.**
9. **All ductwork, including returns and bathroom vent ducts, in unconditioned spaces shall be insulated to a minimum of R-8.** All duct boots are to be sealed to the wall, floor or sealing with mastic, caulk or foam. Ductwork can be either galvanized, insulated trunk or duct board truck with flex duct to the registers. Ductwork must be installed using proper width hangers in compliance with the Mechanical Code. **(M1061.3. IRC) In floodplain areas, duct systems shall not be installed below the design flood elevation (R324.1.5 IRC).** Flex duct feeder lines must be a minimum of 18" away from the end of the supply trunk.

10. All ductwork shall be installed in a quality manner. Connections and routing of ductwork shall be completed without kinks or sharp bends. There shall be no excessive coiled or looped flexible ductwork. Flexible ducts installed in unconditioned space shall not be installed in cavities smaller than the outer duct diameter. In conditioned spaces, flexible ducts shall not be installed in cavities smaller than the inner duct diameter. Flexible ducts shall be supported at intervals as recommended by the manufacturer, but not more than every five feet.
11. Installation of furnaces shall include all work necessary to provide proper access, clearances to combustible, required lighting and receptacle, combustion air, thermostat, etc. See Kentucky Residential Code for installation details.

B. BATHROOM VENTILATION

1. Bathrooms shall have an **Energy Star Rated fan or fan/light combination fixture**. The fan must be ventilated **by insulated metal or aluminum duct through the dedicated roof, wall, or soffit to the outside of the house with an approved hood**. **The minimum ventilation rate shall be 80 cfm for intermittent ventilation and the fan shall be rated at $\leq .5$ sones (Panasonic FV-08VQ5 WhisperCeiling Fan, Nutone XN80 Ultra or equal) (R303.3 IRC Exception)**. **On combined fan light units, the fan and light are to be operated by separate switches**. **The bathroom vent duct shall be insulated to R-6 in unconditioned spaces**.
2. **When the bathroom vent is used to meet whole house continuous ventilation requirements, it shall meet the specifications listed under HVAC system above.**

XVI. ELECTRICAL

1. All wiring is to be according to the National Electric Code, current edition. The electrician is to obtain a rough-in and a final inspection by a certified electrical inspector. Contractor or subcontractor is to provide and post all permits. **NOTE: Contractor will ensure that the certified electrical inspector places rough-in and final inspection stickers in an appropriate location as proof of compliance.**
2. **All ceiling fans, exhaust fans (including bathroom vent and range hood) and LED bulbs are to be Energy Star qualified.**
3. Provide overhead light fixture in each habitable room, bathroom near bathtub, hallways and stairways controlled by a wall switch. **All light bulbs shall be warm or "soft white" light (2700–2900K) LED bulbs. The light bar over bathroom sink shall have soft white, 9 watt globe type LED bulbs. Bathroom mechanical exhaust vent (must be Energy Star Rated) and each light in bathroom are to be on a separate wall switch. Bathrooms may have an overhead Energy Star Rated fan/light combination rather than a separate overhead light. Overhead bathroom light shall be located close to tub to provide light to tub area.** Provide two overhead lights in kitchen, one over sink area (within three feet horizontally) and one over eating area. There shall also be a light over the cooking stove in range hood. Light bars above the medicine cabinet shall be the same width as the medicine cabinet with **soft white, 9 watt globe type LED bulbs**. Light bar is to be connected to a wall switch at the sink in an accessible location. **Overhead fixtures shall be rated to provide a minimum of 1750 lumens in bedrooms, kitchens and living**

rooms, 3,500 lumens in basement and 900 lumens in hallways and overhead light in bathrooms.

4. **Provide a dedicated circuit for a microwave oven at owner's choice of location or, if none, on utility closet wall next to closet door on hallway side.**
5. Bathroom, kitchen and exterior are to have Ground Fault Circuit Interrupter (GFCI) protection. **NOTE:** There MUST be two separate, dedicated circuits to the kitchen counter top besides the other required circuits. Bath GFCI's must be dedicated.
6. Required fixtures shall be standard grade, decorative globe type with compact fluorescent **or LED** bulbs provided. Open "clam shell" type fixtures are not acceptable. **Open LED bulbs may be used in utility areas, closets and unfinished basement areas.**
7. Exterior lights to be wall mounted exterior grade porch light, minimum 60 watt, at front and rear doors. Motion detector controls are preferred.
8. Panel boxes must be Square D, Murray, General or equal, minimum 30 circuits, provide 200 amp. service. Breaker panels must have all circuits labeled. **When electric panel boxes are installed in basement, the area behind the box shall be finished drywall with R-13 insulation. If panel box is installed on wall with foam insulation, it must be installed on plywood backing over top of foam, not directly on concrete basement wall with no insulation.**
9. **Electrical outlets shall have a minimum height of 15" above the finished floor from the bottom outlet and a maximum height of 48" above the finished floor from the top outlet. Light switches, fan switches and thermostats shall be centered at a maximum height of 48" above floor. If an outlet or switch is obstructed by a base cabinet or countertop, then the maximum height shall be 46" above the finished floor.**
10. Refrigerators are not to be on GFCI circuits

XVII. ELECTRONIC SAFETY AND SECURITY

A. SMOKE DETECTORS

1. Smoke Alarms - All houses are to be equipped with AC/DC smoke detectors. They shall be interconnected with battery backup. As a minimum, install one smoke detector in each bedroom near door and one in hallway within eight feet of bedroom doors **(the hallway smoke detector shall be a combination carbon monoxide detector when one is required)**. There should be at least one smoke detector on each story including basements. **Try to keep smoke alarms as far from kitchen as possible.** The manufacturer of the specific smoke detector being used will provide written instructions on the locations for their product. Follow the manufacturer's instructions on locations and other details. Do not put smoke alarms on a dedicated circuit.
2. Prohibited Locations - Smoke detectors shall not be installed within a 36 inch horizontal path from a door to a bathroom containing a shower or tub. Smoke detectors shall not be installed within a 36 inch horizontal path from the supply registers of a forced

air heating or cooling system and shall be installed outside of the direct airflow from those registers. Smoke alarms and smoke detectors shall not be installed within a 36 inch horizontal path from the tip of the blade of a ceiling-suspended fan.

B. CARBON MONOXIDE ALARM

1. For all houses that have any type of gas service, flue or other fossil fuel burning device in house for heating, cooking, water heater etc. or that have an attached carport or garage, contractor shall **provide a carbon monoxide detector** near the bedrooms and near the carbon monoxide producing appliance with at least one detector on each floor of the house including any basement. **CO detectors shall be wired in AD/DC detectors and may be combination smoke detectors. CO detectors shall not be plug in type.**

XVIII. EARTHWORK

A. DRAINAGE

1. Contractors are advised to pay particular attention to code requirements for providing proper drainage. Fill dirt may be required to achieve proper drainage. All porches, exterior slab on grades, patios and stoops shall be sloped 1/4" per foot in the direction of drainage away from the house.
2. **Surface drainage** shall be diverted to a storm sewer conveyance or other approved point of collection so as to not create a hazard. Lots shall be graded so as to drain surface water away from foundation walls. The grade away from foundation walls shall fall a minimum of 6" within the first 10' and back-fill tamped to prevent settling.
3. Where lot lines, walls, slopes or other physical barriers prohibit 6" (152 mm) of fall within 10', the final grade shall slope away from the foundation at a minimum slope of 5 percent and the water shall be directed to drains or swales to ensure drainage away from the structure. Swales shall be sloped a minimum of 2 percent when located within 10' of the building foundation. Impervious surfaces within 10' of the building foundation shall be sloped a minimum of 2 percent away from the building.
4. When required, a **foundation perimeter drain** is to be installed adjacent to the footer. The top of the drain tile pipe shall always be below the bottom of the concrete slab or crawlspace floor. Drain tile shall be 4" perforated plastic pipe with filter fabric sock with 2" of washed or clean gravel 1/2 to 3/4" under the pipe and a minimum of 6" of gravel over the TOP of the drain (10" total). This drain will slope away from the dwelling to the level necessary for complete drainage and will have the terminal end in daylight or a sump pump. Foundation drain shall be inspected prior to covering.

XIX. EXTERIOR IMPROVEMENTS

A. LAWNS AND PLANTINGS

1. All disturbed areas shall be graded smooth, covered with clean topsoil, seeded with grass and mulched with clean straw. All clods, rocks and debris over two inches in diameter are to be removed.
2. All slopes in excess of 3:1 within 10 feet of the house, driveway and walkway (within 50 feet of house) shall receive sod or other approved erosion control materials which will enhance the establishment of a permanent ground cover.
3. If the quantity of stored topsoil is inadequate, or if none has been salvaged from the site, the Contractor shall furnish at his own expense sufficient topsoil to properly prepare site for seeding.
4. Grass seed shall be a mix of Fine Lawn Fescue (80%) and Kentucky Bluegrass (20%) or Annual Rye (20%) and Kentucky Bluegrass (80%). Percent of purity shall be a minimum of 90% with a 90% germination rate. A minimum seven pounds of grass seed shall be evenly spread for each 1,000 square feet of area. Prior to seeding the ground shall be scarified if needed and then raked smooth with clods broken up or removed. The seeded area shall be then lightly raked and watered with a fine spray. Once house is occupied, owner shall water lawn as necessary during dry periods to promote lawn growth. All seeding and sodding shall be done when the ground is frost free and weather is favorable. It is recommended that the contractor provide some additional seed to the homeowner for re-seeding of bare spots.
5. Mulching: All seeded areas shall be mulched with clean, fresh, seed free straw applied at a rate of 100 lbs. per 1,000 sq. feet of area.
6. Maintenance: Maintenance shall continue until a dense, uniform turf is established composed of the grasses specified and until acceptance, and shall include repair of damage caused by erosion. For the purpose of establishing an acceptable standard, scattered bare spots, none of which is larger than one square foot, will be allowed up to a maximum of 3% of any lawn area.

B. DRIVEWAYS

1. Unless otherwise noted in Special Conditions, parking area when required is to be minimum 10 feet wide by 32 feet long or 20 feet wide and 16 feet long. There shall be a five-foot radius at the driveway entrance. When possible, the parking area is to be configured to allow cars to turn around. Entire parking area is to be behind or on the side of the house unless otherwise approved by the project manager. **Paved area is to extend from the required parking area to the street pavement.** Concrete driveways shall terminate at the road right-of-way, with bituminous pavement or concrete continuing from the concrete at the road right-of-way to the edge of the paved traveled way. Any pavement on right-a-way or between the house and the street is not included as parking area.
2. Driveway grades shall not exceed a gradient of four percent within 30 feet of the roadway, then 15 percent overall, then four percent within 30 feet of the dwelling.

Slope or crown concrete driveway $\frac{1}{4}$ inch per foot in the direction of drainage to prevent water from running to joints. The parking area shall be level across its width other than slope required for drainage.

3. When there is a drainage ditch between the property and the street and no existing culvert, provided a minimum twelve inch diameter culvert, twenty feet long. A larger diameter may be required depending on the size of the drainage ditch. There shall be a minimum of six inches of compacted sand or crushed base over the drain pipe. Contractor shall comply with any local regulations if more stringent.
4. Where special conditions allow for gravel driveways or parking areas, the gravel shall be #57 crushed limestone, at least 4" thick and compacted.

C. WALKWAYS

1. All new walkways shall be 42-inch-wide concrete. Any walkways which require more than two steps shall have a handrail installed on one side.
2. **When an accessible ramp or walkway is required to an entry door. The ramp shall be connected to the parking area by a 42" wide walkway made of concrete, asphalt, or other hard surface material approved by the project manager.**
3. Concrete walks or paving shall be one-course construction, plain 4,000 psi concrete, nominally 4 inches thick but in no case less than 3 $\frac{1}{2}$ inches actual thickness. Edges of pavement shall be formed and adequately braced to maintain alignment. Use flexible or curved forms for all curves in walks. Concrete walks are to have a non-slip light broom finish. When concrete walks abut a structure or lie in the path of drainage, they shall be pitched $\frac{1}{4}$ inch per foot in the direction of drainage.
4. Provide walkways with $\frac{1}{2}$ inch expansion joints with pre-molded filler not more than 50 feet apart, and also at walk junctions and intersections, at top and bottom steps and where walks abut curb returns, buildings, platforms or other fixed structures. Expansion joints shall be at right angles to the slab and extend the full length of the slab. The pre-molded filler shall extend to within $\frac{1}{4}$ " of the walk surface.
5. Grooves: Between expansion joints, cut grooves, $\frac{1}{8}$ " to $\frac{1}{4}$ " wide, at least $\frac{3}{4}$ " deep and with spacing approximately equal to the walk width but not greater than six feet on centers.

D. PUBLIC SIDEWALKS

1. Public sidewalks are defined as any sidewalk in the public right-of-way or any sidewalk which runs parallel to a street and is intended for use by the public. Any public sidewalk which is installed, replaced or crossed by a driveway shall meet the following standards in addition to the specifications listed above for walkways and driveways.
2. All public sidewalks are to be constructed in compliance with the U.S. Dept. of Justice 2010 ADA Standards for Accessible Design; Title II regulations at 28 CFR 35.151 and the 2004 ADAAG at 36 CFR part 1191, appendices B and D.

3. Public sidewalks shall be concrete and have a minimum clear width of 48 inches not including any curb. Public sidewalks shall be wider than 48 inches if required by local regulations. If the existing sidewalk is wider than 48 inches, the public sidewalk shall be the same width as the existing sidewalk.
4. When a driveway crosses a public sidewalk, there should be a minimum 36-inch wide passage with a cross slope of no more than 1:48 (2%).
5. An accessible curb ramp or other sloped area is required wherever a new or altered public sidewalk crosses a curb or other barrier to a street, road, or highway. The running slope of a new curb ramp should not exceed 1 in 12 (8.33%). The cross slope shall not exceed 1:48 (2%). Where provided, curb ramp flares shall not be steeper than 1:10. Level landings shall be provided at the tops of curb ramps. The landing clear length shall be 36 inches (915 mm) minimum. The landing clear width shall be at least 48 inches wide and as wide as the curb ramp, excluding flared sides, leading to the landing.
6. A 24-inch long strip of detectable warning shall extend across all ramps the full width of the ramp at the bottom of the ramp or other uncurbed connection at street crossings. The detectable warning shall consist of raised truncated domes with a diameter of nominal 0.9 in (23 mm), a height of nominal 0.2 in (5 mm) and a center-to-center spacing of nominal 2.35 in (60 mm) and shall contrast visually with adjoining surfaces, either light-on dark, or dark-on-light. The material used to provide contrast shall be an integral part of the walking surface.

E. TERMITE TREATMENT

1. All new house additions shall be pre-treated for termites to provide a protective barrier using a registered product applied in accordance with manufacturer's instructions. Pre-treat before pouring any concrete slabs or basements.
2. All termite treatment shall be done by a licensed pest control operator. **Treatment shall include a minimum five-year warranty that covers re-treatment and repair of any damage at no cost to the owner.** Work to be inspected annually with report in writing to owner. Owner reserves the right to renew warranty for an additional five years. Certificate of treatment is to be provided prior to payment for this item.

XX. UTILITY SERVICES

A. SITE UTILITIES

1. All public water, sewer, electric and natural gas utilities shall be installed in accordance with the standards of design and construction of the respective municipal department or utility department.
2. Contractor is to include any required tap-on fees and inspection fees as part of the bid unless noted otherwise in the special conditions or information for bidders.
3. Contractor is responsible for providing public water, sewer, electric and gas utilities to the connection point with the utility provider in accordance with local standards.

4. Water supply lines shall be installed at least 36” below ground surface. All exposed lines within crawl spaces shall be insulated unless it is a conditioned crawl space.
5. Contractor is responsible for installing and paying for any temporary services required during construction.