



Virginia Housing Development Authority
**2017¹ Minimum Design and Construction
Requirements**

Requirements for All Developments

The following requirements were created to address issues related to the design, construction, maintenance, marketing, life cycle costs and aesthetic concerns for developments utilizing low income housing tax credits (LIHTC), and/or developments financed by the Virginia Housing Development Authority (VHDA). Submission requirements for VHDA loan applications are listed on the Architectural & Engineering Review sheet which can be found at the conclusion of the Minimum Design and Construction Requirements (MDCR). Submission requirements for the LIHTC program are contained in the tax credit application.

Drawings, specifications and scope of work are to comply with the latest applicable issue of the *Virginia Uniform Statewide Building Code (USBC)*², *International Building Code (IBC)*³, other applicable Virginia and national codes, requirements of localities, prevailing design and construction practices and the *Minimum Design and Construction Requirements* of VHDA. Installation of materials, equipment, products, and building systems are to be per the manufacturers' requirements, specifications, and recommendations. All developments are to comply with accessibility requirements of *USBC*.

Requirements for New Construction

SITE WORK

1. Finished floor elevations of buildings are to be a minimum of 8 inches higher than the adjoining finished grade. When achieving an 8 inch height separation is not feasible, due to accessibility requirements or other conditions, provide an alternate solution acceptable to VHDA.
2. Areas around buildings are to be graded to have a minimum 5% slope away from foundation walls for a minimum distance of 10 feet, per *IBC*. Install yard drains, storm inlets, or drainage pipes under concrete walks to drain properly if the space between foundation walls and concrete walks is less than 10 feet. Drainage systems are to be designed to avoid water drainage over sidewalks. Provide an alternate drainage solution acceptable to VHDA:
 - a. when buildings are closer than 10 feet to concrete walks
 - b. when a minimum 5% slope is not feasible
 - c. to avoid water draining over sidewalks
 - d. at accessible entrances, when applicable

¹ The 2017 VHDA Minimum Design and Construction Requirements apply to VHDA loans with a 2017 application date, as well as developments receiving Federal Low-Income Housing Tax Credit allocations for year 2017.

² (USBC 2012) *Virginia Uniform Statewide Building Code* (Latest applicable edition as referenced by the *USBC*)

³ (IBC 2012) *International Building Code* (Latest applicable edition as referenced by the *IBC*)

3. Install seamless gutters and downspouts, or an internal drainage system for all buildings. When discharging on grades steeper than 20%, or less than 1%, water from gutters and downspouts is to be piped underground to a storm sewer system, or to daylight at grades that will avoid soil erosion.
4. Paving designs are to be based upon the soil report, California Bearing Ratio (CBR) of the soil, traffic count, and loading. Drive lanes of parking lots are to be designed for dumpster trucks. Parking bays may have lighter paving than the drive lanes of parking lots.
5. Extend concrete dumpster pads at least 12 feet into the asphalt so that the load bearing wheels of trucks rest on concrete while servicing the dumpsters.
 - a. Thickness of concrete is to be a minimum of 6 inches with reinforcement.
 - b. Dumpsters and/or compactors accessed via an accessible route are to meet accessibility requirements.
 - c. Install a privacy screen on at least three sides of all dumpster and/or compactor pads.
6. Minimum width of sidewalks is to be 3 feet. Sidewalks that are located perpendicular to parking spaces are to be a minimum of 5 feet wide excluding curb or 3 feet wide with 2 feet of space between the sidewalks and curbs. Provide gravel and sand base under walks when required by the soil report. Provide control and expansion joints.
7. Site lighting shall not be obstructed by trees.
8. Grade to avoid standing water. Provide a smoothly graded transition from disturbed to undisturbed areas. Finish grade with clean topsoil. Seed and straw, and/or landscape all bare and disturbed areas. Provide ground cover materials or sod for slopes steeper than 20%. Provide foundation plantings in the front of all buildings. Clean site and dispose of all construction debris. Grass must be established prior to project closeout.

ARCHITECTURAL

1. ROOFING
 - a. Roof sheathing thickness is to be a minimum of $\frac{15}{32}$ inch thick plywood or $\frac{15}{32}$ inch OSB. Install sheathing with clips. ZIP System roof sheathing or similar products are not accepted.
 - b. Install drip edge on all sides of the roof.
 - c. Install ice barrier extending from eave's edge to a point 24 inches inside the exterior wall of buildings.
 - d. Roof shingles are to be a minimum 25-year, anti-fungal product, and are to be nailed (not stapled).
 - e. Flat roofs to have a minimum 20-year manufacturer's warranty.
2. Provide permanent access to all flat roofs. Access to be easily reachable and located in an interior common area.
3. Install walk pads that provide access to all rooftop condenser units.
4. Provide roofs/overhangs over the front entrance doors to all units that are accessed directly from the exterior. Provide a minimum overhang of 30 inches along the front and 12 inches along each side of the door; or the door may be setback a minimum of 24 inches from the face of the exterior wall.

5. Stairs to apartment units where stair halls are not enclosed are to be protected from weather by design features, such as, setting back stairs a minimum 5 feet from the exterior wall and/or installing a roof overhang at the second floor level, projecting a minimum of 5 feet beyond the first riser.
6. Install waterproofing on exterior walls up to finished grade where finished floor elevations of apartment units or public spaces are below adjoining finished grades. Provide a 10-year material/manufacturer's warranty.
7. Install weep holes in brick veneer at foundation walls, over lintels, and relief angles.
 - a. Weep holes at foundation walls are to be a minimum 6 inches above finished grade.
 - b. Provide mortar mesh to prevent blockage of weep holes.
 - c. Provide continuous flashing at all weep holes and end dams at flashing terminations.
8. At brick window sills, and caps for brick veneer walls that do not terminate directly under roofs, provide a positive slope resulting in a minimum 3/4 inch differential over the length of the brick.
9. All wood framing in contact with concrete or masonry is to be of treated wood.
10. Provide sill sealer for sill plates at all exterior walls.
11. All brick veneer or sidings, such as vinyl, aluminum, wood and fiber cement board, are to have a solid backing of plywood, OSB, gypsum, or similar material. Siding and brick are to be installed over an independent drainage plane, such as Tyvek® or equal. Fasten siding to framing with nails penetrating a minimum 3/4 of an inch into studs. Install pre-manufactured mounting blocks for all penetrations in siding such as electrical, plumbing, HVAC, etc.

EXCEPTION: Exterior wall sheathing systems with integrated drainage planes may be used when observation reports are provided by the manufacturer and the following conditions are met:

 - 1) Pre-installation
 - a) General Contractor to hold pre-installation meeting with architect and manufacturer prior to installation. Manufacturer's observation reports to include documentation of meeting.
 - b) Manufacturers' flashing details including windows, doors, joints and penetrations must be maintained on site.
 - c) Store materials to meet manufacturer's requirements.
 - 2) Installation
 - a) The integral drainage plane must be preserved. Use manufacturer's approved products including tape, tape gun and roller.
 - b) When weather conditions warrant, follow manufacturer's requirements for inclement weather installation and storage of materials.
 - c) Manufacturer's representative to review the final installation to confirm all requirements are met **prior** to installation of exterior cladding. Manufacturer's observation reports documenting installation acceptance is required and must be maintained on site.
12. The use of foil faced sheathing is prohibited.
13. The bottom of all siding and window sills are to be a minimum of 6 inches above the finished grade or mulch beds.

14. Exterior wooden trim, brickmolding, sills, fascia, rake boards, and columns, are to be clad with vinyl, vinyl coated aluminum, or similar materials. Use materials designed for cladding with a minimum thickness of 0.019 inch and provide a stiffening crimp for trim and fascia boards are more than 8 inches wide. VHDA recommends the use of low maintenance composite/manufactured materials instead of wood for exterior use.
15. Powder coat all exterior steel products or provide an exterior steel paint that can achieve a minimum 10-year material warranty. Prepare surfaces per warranty requirements. Prime and paint steel prior to placement in concrete.
16. Use vinyl, aluminum, or steel for railings, handrails, guard rails, posts and pickets instead of wood.
17. Windows and sliding glass doors:
 - a. Provide minimum ½ inch insulated glass.
 - b. Provide minimum 10-year warranties for material and breakage of seal.
 - c. Provide thermal break for aluminum frames.
 - d. Install and flash per manufacturer’s specifications.
 - e. Before installing windows; perform initial installation with the Construction Control Officer.
18. All exterior doors, except sliding glass doors, are to be of insulated fiberglass or insulated metal. Exterior wooden door jambs and molding require composite material, such as FrameSaver® or equal, at their lowest points.
19. Install hard surface flooring at the interior of all entrance doors, except for doors entered through carpeted interior hallways. Hard surface area is to be approximately 3 foot by 4 foot using flooring materials such as VCT, sheet vinyl, hardwood, or tile.
20. Resilient flooring such as, but not limited to, sheet vinyl and VCT is to be installed over minimum nominal ¼ inch underlayment grade plywood, or similar underlayment material. Ceramic tile or similar flooring is to be installed over minimum nominal ¼ inch cementitious board or similar underlayment material. Flooring may be installed over concrete provided concrete is finished smooth and uniform. When installed over Gypcrete, or a similar material, apply manufacturer approved sealer.
21. Carpets are to have the minimum number of seams. Seams are not to be located in heavily trafficked areas. T-seams are not acceptable except in closets.
22. All interior doors are to be side hinged. Bifold, pocket, or sliding doors are not acceptable. Install or undercut doors a minimum of ¾ inch clear to prevent dragging and to provide ventilation. Paint bottom top and all other sides of doors.
23. All base and base moldings in a unit are to be solid wood and are to match in design and finish.
EXCEPTION: Ceramic or stone baseboard is acceptable at matching flooring.
24. All windows are to have blinds, shutters, or other similar products, and sliding glass doors are to have vertical blinds.

25. Provide a minimum of 1 ½ bathrooms (one full bathroom and one half bathroom) in all two bedroom units and a minimum of 2 full bathrooms in all three or more bedroom units.
26. Concealed solid dimensional wood blocking is to be provided for all handrails, grab bars and wall mounted accessories.
EXCEPTION: Concealed sheet metal blocking may be used at wall mounted accessories.
27. Tub and shower surrounds built of ceramic tile, marble, or similar materials are to be installed over minimum ½ inch cementitious board.
28. Provide a pass-through opening with counter space when kitchen and dining/living areas are separated by a wall.
29. Kitchen cabinets and bathroom vanities are to comply with *Virginia Housing Development Authority's Minimum Cabinet Requirements*:
 - a. All cabinets are to be factory/manufacturer assembled.
 - b. All exposed portions of cabinetry must have factory applied finish.
 - c. Kitchen cabinets and bathroom vanities are to abut the side walls or provide a minimum spacing of 12 inches between wall and cabinets. Wall cabinets are to abut the ceiling/soffits or provide minimum of 12 inches between cabinet and ceiling/soffits.
 - d. Kitchen wall cabinets are to be screwed to studs or blocking with a minimum of four screws; two in each upper and lower nailing strip for each wall cabinet.
 - e. Plastic laminate countertops are to be post formed or have back splashes that are factory attached to the countertop and sealed.
 - f. A side splash is to be installed where countertops abut walls.
 - g. Holes in cabinet backs for plumbing are to be drilled, sealed, and completely covered by escutcheon plates.
30. Install a cleanable surface, such as plastic laminate, metal, or ceramic tile on the sidewall next to the cooking range when it is located directly adjacent to a wall. Materials such as plastic laminate or metal are to be installed with adhesive.
31. APPLIANCES
 - a. Provide 30 inch wide range in all units except studio/efficiency and one bedroom elderly apartments, which may have a minimum 20 inch wide range. Provide maximum 24 inch wide range hood for all 20 inch wide ranges.
 - b. Provide a range hood or combination range hood-microwave over all cooking ranges.
 - c. Provide a 24 inch wide dishwasher in all units, except for studio/efficiency apartments, which may have 18 inch wide dishwashers.
 - d. All refrigerators are to be frost free. The refrigerators are to have separate doors for freezer and refrigerator compartments. Minimum sizes of refrigerators are to be 12 cubic feet for studio/efficiency apartments, 14 cubic feet for 1 and 2 bedroom apartments, and 16 cubic feet for 3 and 4 bedroom apartments.
 - e. Provide laundry equipment, or connections for full-size side-by-side or full-size stack type washers and dryers, in all units. When provided, laundry equipment and connections shall be installed in a closet with doors in a location other than a living room or bedroom. Otherwise,

provide onsite laundry facilities. (See “Plumbing” section for washing machine pan requirements.)

- f. All kitchen appliances in an apartment unit are to match in color.

MECHANICAL

1. Provide Heating, Ventilation, and Air Conditioning (HVAC) equipment with R-410A refrigerant in all dwelling units. All apartments are to have ducted HVAC systems except as noted in #3 below. Size of HVAC equipment, ducts and diffusers are to be designed per heat gain/loss calculations.
2. For all ducted HVAC systems including ducted mini-splits and self-contained packaged systems (similar to Magic-Pak or First Co):
 - a. Air supply diffusers are to be located near windows in living rooms, dens and bedrooms.
EXCEPTION: The mechanical engineer may locate diffusers at alternate locations with VHDA’s prior approval based on supporting calculations.
 - b. Provide HVAC diffusers for kitchens and all full baths.
 - c. Provide premanufactured air filters.
 - d. Seal air duct penetrations in unheated spaces.
 - e. Refrigerant and condensate lines are to be concealed within walls.
 - f. Provide a separate ducted return for each floor of townhouse units.
 - g. Heat pump to include auxiliary heat.
3. Ductless Heat Pumps (mini-splits) may be used in efficiencies, 1 bedroom units or elderly housing developments.
 - a. All mini-splits are to discharge condensate to grade through a pipe concealed within the exterior wall system.
 - b. Provide separate mini-split wall mounted unit for each bedroom, den or living room.
 - c. Provide separate wired wall mounted thermostat for each mini-split wall mounted unit.
 - d. Provide a heater with a thermostat or timer controlled heat lamp for all full baths.
4. All exhaust ducts are to discharge to the exterior of the building, and terminate into vent caps. Vent caps to be of a quality that will minimize repair and replacement.
5. Do not install condenser units in front of windows.
6. Electric baseboard heating and electric forced air heating shall not be used as the primary heating method.

PLUMBING

1. Clothes washing machines or connections for clothes washing machines are to have a pan, with a drain, connected to the sewer system per applicable plumbing code.
2. The bottoms of bath tubs are to have slip resistant/textured finish.
3. All tubs/showers and shower diverters are to have internal shut-off-valves or external shut-off-valves with access panels.

4. Bathrooms which include a roll-in shower are to have ceramic or similar tile flooring. Roll-in showers are to be either:
 - a. Ceramic or similar tile floor with water proofing membrane extending a minimum 8" up walls. A minimum of 3'-0" of the bathroom floor is to slope back towards the shower drain at 2%, with a zero height transition between the bathroom floor and the shower floor, - or -
 - b. Premanufactured with a trench drain located immediately adjacent to, and the full length of, the shower. The bathroom floor shall have a 2% slope towards the trench drain.
5. When installing wall-hung sinks, provide concealed arm type carriers.
6. The use of PVC foam core pipe is prohibited.
7. All floor drains and indirect waste receptors to receive trap primer or code approved drain trap seal device.
8. Seal around all plumbing penetrations.
9. When installing **electric** water heaters provide the following minimum sizes:
 - a. Studio/1BR units 30 gallon
 - b. 2BR units 40 gallon
 - c. 3BR units 50 gallon

ELECTRICAL

1. Provide fluorescent light fixtures or LED light fixtures in all public common areas such as offices, multipurpose rooms, laundry rooms, hallways, and stairs.
2. Kitchens are to have a minimum of one light fixture 4 feet long with either LED or two 32 watt fluorescent bulbs, or lighting fixture(s) that provide a minimum illumination of 30 foot candles distributed across all countertops.
3. Pre-wire cable TV and internet outlets for all bedrooms, living rooms, family rooms, and dens. Provide a minimum of one telephone outlet in either the kitchen or living area, and one telephone outlet in the master bedroom. Provide interface for incoming service at one central location per building. All wiring for the interior and exterior of the building is to be concealed within the walls.
4. Exterior fixtures are to be LED, fluorescent, metal halide, high or low pressure sodium, or mercury vapor. Tenant controlled exterior lighting is exempt. Provide exterior lighting to illuminate all parking areas, dumpster pads, building entrances and mailboxes with a minimum of one foot candle of illumination. Provide illumination so that building numbers and apartment numbers are legible at night.
5. Seal around all electrical penetrations.

Requirements for Rehabilitation

All **additions** and **adaptive reuse** are to comply with the VHDA Minimum Design and Construction Requirements (*MDCR*) for *New Construction*. **Adaptive reuse** may also be required to comply with the *MDCR* for *Rehabilitation* where VHDA deems applicable.

All rental offices, public areas, and associated parking and routes are to meet the latest USBC accessibility requirements for new construction. Developments that have accessible units are to provide accessible routes, accessible parking, and accessible common areas.

Identify any hazardous materials/conditions such as asbestos, lead paint, radon, recalled drywall, mold on site and/or in buildings and contaminated soils. Address or abate all hazardous materials per applicable regulations. Submit abatement certification to the Virginia Housing Development Authority if requested.

SITE WORK

1. Identify areas that require grading to drain water away from buildings and areas where adjoining grades are higher than finished floor of buildings:
 - a. Provide a minimum distance of 6 inches between finished grade or mulch beds, and the bottom of siding and window sills.
 - b. Provide a minimum of 5% slope away from foundation walls, for a minimum distance of 10 feet.
 - c. Provide alternate solutions acceptable to VHDA when required grades, slopes, or other site conditions make the above requirements infeasible.
2. Provide seamless gutters and downspouts for all buildings, or an internal drainage system. When discharging on grades steeper than 20%, or less than 1%, water from gutters and downspouts is to be piped underground to a storm sewer system, or to daylight at grades that will avoid soil erosion. Avoid water drainage over sidewalks.
3. Extend concrete dumpster pads at least 12 feet into the asphalt so that the load bearing wheels of trucks rest on concrete while servicing the dumpsters.
 - a. Thickness of concrete is to be a minimum of 6 inches with reinforcement.
 - b. Dumpsters and/or compactors accessed via an accessible route are to meet accessibility requirements.
 - c. Install a privacy screen on at least three sides of all dumpster and/or compactor pads.
4. Concrete that is cracked, crumbling, spalling, heaving or settling, or may be a safety issue is to be repaired or replaced. Provide a solution acceptable to VHDA if any of these conditions exist. Sidewalks at new locations to comply with new construction guidelines.
5. Asphalt that has cracking, alligating, or a deteriorating sub-base is to be repaired or replaced. Provide a solution acceptable to VHDA if any of these conditions exist. Paving at new locations to comply with new construction guidelines.

6. Remove all dead bushes, trees, tree-stumps, and their above-ground roots. Remove all portions of tree branches that overhang roofs and all branches that come within 10 feet of roofs.
7. Grade to avoid standing water. Provide a smoothly graded transition from disturbed to undisturbed areas. All areas which have dead grass are to be tilled. Seed and straw, and/or landscape all bare and disturbed areas. Finish grade with clean topsoil. Provide ground cover materials or sod for slopes steeper than 20%. Provide foundation plantings in the front of all buildings. Clean site and dispose of all construction debris. Grass must be established prior to project closeout.

ARCHITECTURAL

1. Install waterproofing up to finished grades for all perimeter walls of finished and unfinished spaces which are below grade and where evidence of water, moisture, or mildew is present. Waterproofing may be installed on the exterior or interior sides of the wall. The waterproofing system is to have a minimum 10 year manufacturer's warranty.
2. All debris and wood are to be removed from crawl spaces.
 - a. Install sump pump or drain tile discharging to daylight for any area accumulating water.
 - b. Install a minimum 6 mil vapor barrier, with a 12 inch overlap and taped seams, on floor of crawl spaces and provide adequate crawl space ventilation.
3. Remove all abandoned and non-operable equipment, devices and accessories. VHDA may approve abandoned material that is secured, sealed and concealed.
4. Structural deficiencies are to be identified and corrected. If requested by VHDA, corrective measures to be designed, inspected, and certified by a structural engineer.
5. Install minimum of R-19 insulation in unconditioned crawl spaces and basements and R-38 insulation in attics.
6. When replacing drywall at an exterior wall or replacing exterior sheathing, provide wall insulation at affected areas per the latest adopted edition of the International Energy Conservation Code.
7. Roof inspection reports are required for all roofs more than 5 years old. Report to include age and remaining life of roofs and areas that need repairs. Replace all roofs with a remaining life of less than 5 years. Repair or replace all roofs with damage or leaks.
8. When replacing pitched roofs:
 - a. Repair or replace all damaged sheathing, rafters, and/or trusses.
 - b. Replace all $\frac{3}{8}$ inch sheathing with a minimum of $\frac{15}{32}$ inch plywood or $\frac{15}{32}$ inch OSB. Install sheathing with clips. ZIP System roof sheathing or similar products are not accepted.
 - c. Replace all existing attic vents and pipe collars. Replace rusted or damaged flashing. Replace all existing sealant.
 - d. Roof shingles are to be a minimum 25 year, anti-fungal product, and are to be nailed (not stapled). Do not install new shingles over existing shingles. Replace existing ridge vents.
 - e. Install drip edge on all sides of the roof.

- f. Install ice barrier extending from eave's edge to a point 24 inches inside the exterior wall of buildings.
 - g. Provide roof ventilation per the latest USBC for new construction.
9. When replacing flat roofs:
- a. Remove and dispose of existing roofing and above deck insulation, damaged vents and other items not in good condition.
 - b. Provide a minimum R-25 continuous insulation above the roof deck or provide a minimum R-38 insulation in the attic space.
 - c. New roofing is to have a minimum 20-year manufacturer's warranty.
 - d. Provide roof ventilation per the latest USBC for new construction.
10. Install walk pads that provide access to all rooftop condenser units.
11. If equipment is installed on a roof, provide easily reachable access from an interior common area.
12. Stairs to apartment units where stair halls are not enclosed are to be protected from weather by design features. Install an awning, a roof overhang at the second floor level, or a roof at the stair hall entrance. Provide a minimum overhang of 5 feet from first riser. All buildings in a development are to have similar design features. Historic buildings may be exempt.
13. Exterior wooden trim, brickmold, sills, fascia, rake boards, and columns are to be clad with vinyl, vinyl coated aluminum, or similar materials. Use materials designed for cladding with a minimum thickness of 0.019 inch and provide a stiffening crimp for trim and fascia boards are more than 8 inches wide. Replace all damaged wood prior to cladding. VHDA recommends the use of composite/manufactured materials instead of wood for exterior use. Exceptions may be considered for historic buildings.
14. When repainting existing or installing new exterior steel products, powder coat or provide an exterior steel paint that can achieve a minimum 10-year material warranty. Prepare surfaces per warranty requirements. Prime and paint steel prior to placement in concrete.
15. Use vinyl, aluminum, or steel for railings, handrails, guard rails, posts and pickets instead of wood.
16. When replacing siding:
- a. New siding is to have solid backing of plywood, OSB, gypsum, or similar material. Siding is to be installed over an independent drainage plane, such as Tyvek® or equal.
 - EXCEPTION: Exterior wall sheathing systems with integrated drainage planes may be used when observation reports are provided by the manufacturer and the following conditions are met:
 - 1. Pre-installation
 - a. General Contractor to hold pre-installation meeting with architect and manufacturer prior to installation. Manufacturer's observation reports to include documentation of meeting.
 - b. Manufacturers' flashing details including windows, doors, joints and penetrations must be maintained on site.
 - c. Store materials to meet manufacturer's requirements.
 - 2. Installation

- a. The integral drainage plane must be preserved. Use manufacturer's approved products including tape, tape gun and roller.
 - b. When weather conditions warrant, follow manufacturer's requirements for inclement weather installation and storage of materials.
 - c. Manufacturer's representative to review the final installation to confirm all requirements are met **prior** to installation of exterior cladding. Manufacturer's observation reports documenting installation acceptance is required and must be maintained on site.
 - b. Do not install new siding over materials such as vinyl siding, Thermo-ply®, or other flexible materials.
 - c. Material such as T1-11, wood siding, or hardboard lap-siding may be used as backing for new siding, provided it is in good condition.
 - d. Repair, replace, and re-nail all sections of damaged siding or sheathing to provide a uniform and flat surface.
 - e. Fasten siding to framing with nails penetrating a minimum $\frac{3}{4}$ of an inch into studs.
 - f. Install mounting blocks for all penetrations in siding such as electrical, plumbing, HVAC, and ductwork etc.
17. The use of foil faced sheathing is prohibited.
18. Repair masonry walls having cracks and/or settlement. Replace damaged brick and point-up deteriorated mortar to match existing. Replace rowlocks for window sills that do not have a slope to drain water away from building. Prime and paint all metal lintels which are corroded, or not already painted. Remove abandoned items from brick and power wash/clean exterior of buildings.
19. Replace all damaged windows.
20. Replace single glazed windows with insulated glass.
- a. When window replacement is not permitted in historic buildings, repair or replace existing windows and install triple track operable storm sashes, with screens, over existing single glazed windows.
 - b. When conditions make storm sashes not feasible, provide an alternative solution acceptable to VHDA.
21. When replacing windows and/or sliding glass doors:
- a. Provide minimum $\frac{1}{2}$ inch thick insulated glass.
 - b. Provide minimum 10 year warranties for material and breakage of seal.
 - c. Provide thermal break for aluminum frames.
 - d. Provide new construction windows when replacing siding.
 - e. Install and flash per manufacturer's specifications. Perform initial replacement with Construction Control Officer.
22. All windows are to have blinds, shutters, or other similar products, and sliding glass doors are to have vertical blinds. Replace all blinds that are damaged and/or do not match in color.
23. Repair or replace all damaged or dented doors, jambs and hardware.

- a. When replacing exterior doors, except sliding glass doors, replacement doors are to be insulated fiberglass or insulated metal. Wooden door jambs and molding require composite material, such as FrameSaver® or equal, at their lowest points.
 - b. Solid core wood doors may be used where entrances are located in interior conditioned corridors.
24. All entry doors to apartment units, except entry doors located in conditioned corridors, are to have weather stripping and threshold to provide a tight seal around the door and to minimize heat loss/gain due to air infiltration.
25. Replace all damaged Gypcrete, or similar material, floor sheathing and floor joists.
26. Install an area approximately 3 feet by 4 feet using materials such as VCT, sheet vinyl, hardwood flooring, or tile at the interior of all entrance doors, except for doors entered through carpeted interior hallways.
27. Repair or replace all damaged or mismatched flooring. On a room by room basis, all flooring must match in color and design.
28. Resilient flooring such as, but not limited to, sheet vinyl and VCT is to be installed over minimum nominal ¼ inch underlayment grade plywood, or similar underlayment material. Ceramic tile or similar flooring is to be installed over minimum nominal ¼ inch cementitious board or similar underlayment material. Flooring may be installed over concrete provided concrete is finished smooth and uniform. When installed over Gypcrete, or a similar material, apply manufacturer approved sealer.
29. Carpets are to have the minimum number of seams. Seams are not to be located in heavy traffic areas. T-seams are not acceptable except in closets. Remove shoe molding/quarter-round molding before installing carpet.
30. Provide a pass-through opening with counter space when kitchen and dining/living areas are separated by a wall.
31. Interior finishes: doors, moldings, paint, and drywall.
- a. Replace all interior bifold, pocket, or sliding doors with side hinged doors.
 - b. Repair or replace all damaged doors and trim.
 - c. All doors, door trim, and door hardware in a unit are to match in design and finish.
 - d. Install or undercut doors a minimum of 3/4 inch clear to prevent dragging and to provide ventilation.
 - e. Paint bottoms, tops, and all other sides of new doors.
 - f. All base and base moldings in a unit are to be solid wood and are to match in design and finish.
EXCEPTION: Ceramic or stone baseboard is acceptable at matching flooring.
 - g. Repair flaws in drywall such as, but not limited to, holes, failing tape joints, cracks and nail pops. Replace all drywall that has mold, mildew, or signs of moisture.
 1. When drywall replacement is required, match adjacent type and thickness.
 2. Nail pops and settling drywall must be re-screwed to framing.
 3. Repairs, including previous repairs, are to match the adjacent surface and the unit's intended finish.

32. Repair damaged or compromised draft stopping and/or fire stopping
33. Concealed solid dimensional wood blocking is to be provided for all handrails, grab bars and wall mounted accessories.
EXCEPTION: Concealed sheet metal blocking or toggle bolts may be used at wall mounted accessories.
34. Replacement or repairs of tub and shower surrounds built of ceramic tile, marble, or similar materials are to be installed over minimum ½ inch cementitious board.
35. When replacing kitchen cabinets and/or bathroom vanities all new cabinets are to comply with *Virginia Housing Development Authority's Minimum Cabinet Requirements*.
- Cabinets and/or vanities that are not being replaced are to be approved by VHDA.
 - All cabinets are to be factory/manufacturer assembled.
 - All exposed portions of cabinetry must have factory applied finish.
 - Kitchen cabinets and bathroom vanities are to abut the side walls or provide a minimum spacing of 12 inches between wall and cabinets. Wall cabinets are to abut the ceiling/soffits or provide minimum of 12 inches between cabinet and ceiling/soffits.
 - Kitchen wall cabinets are to be screwed to studs or blocking with a minimum of four screws; two in each upper and lower nailing strip for each wall cabinet.
 - Plastic laminate countertops are to be post formed or have back splashes that are factory attached to the countertop and sealed.
 - A side splash is to be installed where countertops abut walls.
 - Install a cleanable surface, such as plastic laminate, metal, or ceramic tile to the side wall next to the cooking range when it is located directly adjacent to a wall.
 - Remove and replace all drywall that has mold. Repair or replace all damaged drywall.
 - Holes in cabinet backs for plumbing are to be drilled, sealed, and completely covered by escutcheon plates.

36. APPLIANCES

- Replace all damaged and or dented appliances and all appliances which are more than 8 years old. All kitchen appliances in an apartment unit are to match in color.
- Provide 30 inch wide range in all units except studio/efficiency and one bedroom elderly apartments, which may have a minimum 20 inch wide range. Provide range hoods or combination range hood-microwaves over the cooking ranges. Provide maximum 24 inch wide range hood for all 20 inch wide ranges.
- Dishwashers are required in all units. Provide 24 inch wide dishwashers except for studio/efficiency apartments, which may have 18 inch wide dishwashers.
- All refrigerators are to be frost free. The refrigerators are to have separate doors for freezer and refrigerator compartments. Minimum sizes of refrigerators are to be 12 cubic feet for studio/efficiency apartments, 14 cubic feet for 1 and 2 bedroom apartments, and 16 cubic feet for 3 and 4 bedroom apartments.
- When provided, laundry equipment and connections shall be installed in a closet with doors.

1. All units are to have a Heating, Ventilation, and Air Conditioning (HVAC) system. Sizes of HVAC equipment, ducts and diffusers are to be designed per heat gain/loss calculations. All apartments are to have ducted HVAC systems except as noted in #3 below.
2. When installing a new HVAC system including, but not limited to, traditional split systems, ducted mini-split or self-contained “packaged systems” (similar to Magic-Pak and First Co):
 - a. Replace both air-handlers and condensers at the same time.
 - b. R-410A refrigerant is required in all new HVAC equipment.
 - c. Verify if refrigerant lines are appropriate for new HVAC unit size and type. Lines not being replaced are to comply with all of the requirements of the manufacturer for using existing lines. Submit a letter from the manufacturer that states the use of existing lines will not reduce performance and/or warranty of the heat pumps or other air conditioning systems.
 - d. Condensate and refrigerant lines not located in the mechanical closet are to be concealed within the wall, ceiling, or floor systems.
 - e. Fire-caulk all penetrations in fire partitions and ceilings.
 - f. Seal air duct penetrations in unheated spaces.
 - g. When adding and/or replacing ductwork, air supply diffusers are to be located near windows in living rooms, dens, and bedrooms.

EXCEPTION: The mechanical engineer may locate diffusers at alternate locations with VHDA’s prior approval based on supporting calculations.
 - h. Provide a separate ducted return for each floor of townhouse units.
 - i. Provide premanufactured air filters.
 - j. Replace all diffusers and thermostats.
 - k. Air supply diffusers are to be located in living rooms, dens, bedrooms, kitchens, and full baths.
 - l. Replace condenser pads that are damaged. Pads are to be concrete, solid vinyl, or similar materials. Level all condenser units.
 - m. Heat pumps to include auxiliary heat.
3. Ductless Heat Pumps (mini-splits) may be used in efficiencies, 1 bedrooms or elderly housing development.
 - a. All mini-splits are to discharge condensate to grade through a pipe concealed within the exterior wall system.
 - b. Provide separate mini-split wall mounted unit for each bedroom, den or living room.
 - c. Provide separate wired wall mounted thermostat for each mini-split wall mounted unit.
 - d. Provide a heater with a thermostat or timer controlled heat lamp for all full baths.
4. All exhaust ducts are to discharge to the exterior of the building, and terminate into vent caps. Vent caps to be of a quality that will minimize repair and replacement.
5. Clean existing HVAC ducts and plenums. Verify duct sizes and air flows (cubic feet per minute at supply diffusers) are appropriate for HVAC system. Replace all supply and return vent covers and diffusers. Seal all duct penetrations in unheated spaces. All existing ductwork located in crawl spaces, attics, or any unconditioned space, is to be properly insulated. Clean, service, and repair all HVAC units not being replaced.

6. All bathroom fans are to be in good working condition, cleaned, and ducted out to the exterior. Install fans in all bathrooms, including those with windows.
7. Electric baseboard heating and electric forced air heating shall not be used as the primary heating method.

PLUMBING

1. Identify all water supply material types. Water supply is to have adequate pressure.
 - a. Replace all interior, exterior, and underground PB (Polybutylene) pipes such as “Quest” and “Big Blue” with current code accepted materials.
 - b. Replace all galvanized pipes with CPVC, copper, plastic or other approved materials.
2. Video and jet all sewer lines connecting buildings with the public sewer. Identify pipe material types and repair or replace all corroded, damaged, or settled underground sewer lines. Provide report of video findings to VHDA and include repair/replacement costs.
3. Identify all sanitary pipe material types and replace all galvanized lines and traps with PVC.
4. The use of PVC foam core pipe is prohibited.
5. All floor drains and indirect waste receptors to receive trap primer or code approved drain trap seal device.
6. When replacing water heaters, installations are to comply with latest adopted edition of the *International Plumbing Code for New Construction*. Refer to Code for pan and drain specifications.
7. Clothes washing machines or connections for clothes washing machines are to have an IntelliFlow A2C-WB automatic washing machine water shutoff valve with leak sensor, or approved equal, or have a pan with a drain connected to the sewer system per applicable plumbing code.
8. When installing new wall-hung sinks, provide concealed arm type carrier.
9. All new tubs/showers and shower diverters are to have internal shut-off-valves or external shut-off-valves with access panels.
10. Bathtubs, showers, and surrounds which will not be replaced, are to be refinished or repaired. Remove mold and stains, clean, and re-caulk all tubs, showers, and surrounds. The bottoms of all new bathtubs and showers are to have slip resistant/textured finish.
11. Bathrooms which include a **new** roll-in shower are to have ceramic or similar tile flooring. Roll-in showers are to be either:
 - a. Ceramic or similar tile floor with water proofing membrane extending a minimum 8” up walls. A minimum of 3'-0" of the bathroom floor is to slope back towards the shower drain at 2%, with a zero height transition between the bathroom floor and the shower floor, - **or** -
 - b. Premanufactured with a secondary floor drain located outside of the shower. The bathroom floor shall have a 2% slope towards the secondary floor drain. Provide silicone joint between bathroom and shower floor.

12. Seal around existing accessible and all new plumbing penetrations.

ELECTRICAL

1. Size electric panels and service per load calculations.
2. Electrical panels with fuses are to be replaced with circuit breakers.
3. Use appropriate connectors for connecting aluminum wiring to electrical outlet and switches.
4. All switches, outlets and cover plates that are painted, damaged or worn, are to be replaced and are to match in color and design.
5. Provide ground fault outlets near vanities in all bathrooms.
6. All wiring for the interior and exterior of the building is to be concealed within the walls, ceiling or floor systems. Cable TV, internet and/or telephone wiring exposed within individual apartment units may be accepted when fastened to the edges of baseboards and/or door casings and not crossing any portion of floors, doorways or openings. Exposed electrical service to the building is to be in conduit and run vertically to the meter without horizontal runs.
7. When replacing kitchen cabinets and counter tops, electrical outlets for countertop, ranges, refrigerators, dishwashers, and other appliances are to comply with the latest applicable requirements of the *National Electric Code for New Construction*.
8. Provide fluorescent light fixtures or LED light fixtures in all public common areas such as offices, multipurpose rooms, laundry rooms, hallways, and stairs.
9. Kitchens are to have a minimum of one light fixture 4 feet long with either LED or two 32 watt fluorescent bulbs, or lighting fixture(s) that provide a minimum illumination of 30 foot candles distributed across all countertops.
10. Provide a minimum of one electric smoke detector with battery backup for garden units and a minimum of one electric smoke detector with battery backup for each floor for townhouses.
11. Exterior fixtures are to be LED, fluorescent, metal halide, high or low pressure sodium, or mercury vapor. Tenant controlled exterior lighting is exempt. Provide exterior lighting to illuminate all parking areas, dumpster pads, building entrances and mailboxes with a minimum of one foot candle of illumination. Provide illumination so that building numbers and apartment numbers are legible at night.
12. Seal around existing accessible and all new electrical penetrations.



Virginia Housing Development Authority
Architectural & Engineering Review

VHDA LOAN APPLICATION SUBMISSION REQUIREMENTS:

- The submission requirements listed below are for properties applying for VHDA financing.
- If the property is receiving both VHDA financing and Tax Credits, the scope of work should include amenity items committed to in the Tax Credit Application.
- If the property is applying for Tax Credits only, follow **Tax Credit submission requirements specified in the Tax Credit Application.**
- All drawings submitted shall be printed full size and to scale. Reduced size and digital drawings are not acceptable.

New Construction Requirements

1. Civil drawings **
2. Architectural drawings *
3. Structural drawings **
4. Mechanical drawings **
5. Plumbing drawings (including Fire Suppression) **
6. Electrical drawings (including Fire Alarm) **
7. Three-part specification book encompassing all work
8. Site lighting and photometric drawings **
9. Landscape drawings
10. Geotechnical Report
11. Phase I Environmental Site Assessment
12. Narrative scope of work with itemized cost estimate

Rehabilitation Requirements

1. Civil drawings **
2. Architectural drawings *
3. Structural drawings**
4. Mechanical drawings **
5. Plumbing drawings (including Fire Suppression) **
6. Electrical drawings (including Fire Alarm) **
7. Three-part specification book, or outline specification, encompassing all work
8. Site lighting and photometric drawings **
9. Landscape drawings
10. Unit by unit condition survey not older than 6 months prior to submission
11. Termite Report
12. Phase I Environmental Site Assessment
13. Narrative scope of work with itemized cost estimate
14. Structural, Geotechnical, Roof Condition and Sewer Line reports when applicable

15. For detailed descriptions of submission requirements refer to www.VHDA.com → Business Resources → Multifamily Program, → Multifamily Loan Applications, Guides and Forms

*All drawings to be a minimum 85% complete and prepared by a Virginia licensed architect

**All drawings to be a minimum 85% complete and prepared by a Virginia licensed Professional Engineer

VHDA Architectural and Engineering Review Process

Prior to Loan Commitment

VHDA will review the submission and provide comments. The Architectural & Engineering (A&E) review comments will be captured in a template that will be shared with the borrower. The architect of record and engineers of record will amend the template with their responses. An item will remain “open” until a satisfactory response and corresponding revision to the plans has been received. VHDA will accept full size slip sheet changes rather than full set resubmissions during this process unless greater than 10 sheets are affected. All revisions must be “clouded and tagged”, and the appropriate revision date must be added to the sheet’s title block. **The review process must be completed (no “open” items) before a commitment will be issued.**

Prior to Loan Rate Lock

Once all open items have been closed, the borrower will deliver to VHDA a full size “contract” set of plans and specifications which includes all revisions and addenda made during the VHDA review process. Prior revision clouds and tags must be removed. This set shall include an index identifying all sheets in the set by sheet number and sheet title. In addition, the index must identify all individual revision dates for each sheet. Each sheet’s revision dates must be identified on its title block and match the index of drawings. Add the VHDA Signature Block (found on the VHDA website) to the set’s cover sheet, the index sheet, and the seal section of the specification book. The signature block must be signed by the owner, architect of record, and general contractor. The borrower is responsible for providing a copy of the signed “contract” set and specifications to all parties of the VHDA construction contract.

All revisions that have occurred after VHDA’s last review must be “clouded and tagged” on the “contract” set. A narrative describing and locating those revisions must be included for VHDA’s review.

Each sheet of the “contract” set must include the architect of record’s seal and signature, except drawings completed by consulting engineers which must be signed and sealed by the applicable engineer. **The signed “contract” set of plans and specifications must be reviewed by VHDA before a loan will be rate locked. Furthermore, rate lock will not be allowed until final site plan approval has been obtained.**

Submittals Required after Completion of Construction

Architect to review and approve the general contractor’s as-built drawings and create an as-built package to include all revisions and changes to drawings and specifications. Architect to submit the as-built package in PDF format on a CD at the completion of construction and before the loan may convert to permanent financing.

Solid vertical lines in margins identify revisions to VHDA’s Minimum Design and Construction Requirements from VHDA’s 2016 Minimum Design and Construction Requirements. Format changes such as reorganization, number changes, and phrasing are not included.