

Colonial Heights Department of Building Inspections

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INSPECTION GUIDELINES FOR RESIDENTIAL CONSTRUCTION PROJECTS

Residential Inspections

When to schedule an inspection:

- Footing
 - After the trench is dug and installation of reinforcement
 - Prior to placement of the concrete
- Foundation
 - After backfilling crawl space
 - Prior to placement of foundation sill plates
- Poured Wall
 - After installation of reinforcement
 - Prior to placement of concrete
- Floor Slab
 - After installation of vapor barrier and perimeter insulation (if required)
 - Prior to placement of concrete
- Monolithic Pour
 - After the trench is dug, installation of reinforcement, vapor barrier and perimeter insulation (if required)
 - Prior to placement of concrete
- Drainage / Waterproofing
 - Prior to backfilling foundation
- Veneer
 - After installation of exterior sheathing, flashing, windows and doors
 - Prior to installation of exterior wall covering

- Framing
 - After approval of all sub-trade rough-ins
 - Prior to concealment (hanging drywall)
 - Fireplace Masonry
 - After smoke chamber has been constructed
 - Prior to completion of the chimney above smoke chamber
 - Insulation
 - After framing inspection
 - Prior to concealment
 - Final
 - After all sub-trade final inspections and other required departmental inspections have been approved
 - Final Pool
 - After all work has been completed and electrical final approval
 - Barrier
 - After the pool has been completed
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Footing Design and Inspection:

(Have City approved plans on site.)

Minimum Standard Footing Policy for New Dwellings, and Additions and Attached Garages with habitable space:

A **soil analysis** and an **engineered footing design** developed by a Virginia Registered Professional Engineer shall be submitted with the building permit application for all new residential single family dwellings or additions with habitable space.

Exception 1: An **engineered footing design** is not required for new single family dwellings where the soil analysis indicates a low shrink swell potential and the footing is constructed in accordance with the minimum standard footing and foundation design listed in Exception #2

Exception 2: A **soil analysis and engineered footing design** are not required for additions with habitable space that are located outside of the areas designated as shrink swell soils policy areas and that are constructed in accordance with the following minimum standard footing and foundation design:

1. Minimum footing depth to the bottom of the footing shall be 24 inches.
2. The minimum footing width shall be 16 inches.
3. Minimum thickness of concrete footing shall be 10 inches.
4. Two continuous #4 ($\frac{1}{2}$ inch) reinforcing bars shall be provided throughout the footing. All reinforcing steel shall be secured in place and lapped a minimum of 12 inches where spliced, and shall be supported and anchored with metal stakes and/or chairs which provide a minimum of 3 inches clearance from the sides and bottom of the excavation. Clay brick or CMU blocks shall not be used for support and/or anchors.
5. The minimum overlap at all footing steps shall be two times the footing thickness.
6. Footings supporting interior piers shall be continuous and tied into the exterior footings. This requirement shall not apply to basement column footings or isolated interior fireplace footings.

Minimum Standard Footing Policy for Sheds Over 256 Square Feet and Detached Garages Without Living Space:

1. Minimum depth to the bottom of the footing trench shall be 18 inches.
2. Minimum thickness of concrete footing shall be 8 inches.
3. The minimum footing width shall be 12 inches. (one story only)
4. Reinforcement bars are optional.

Note: Sheds less than 256 square feet in area may be supported by structural elements of 'ground-contact' pressure treated material that is in direct contact with firm, level soil. Such sheds shall be anchored to withstand applicable wind loads.

Minimum Standard Footing Policy for Decks:

1. Minimum depth to the bottom of the footing trench shall be 18 inches.
2. Minimum thickness of concrete footing shall be 8 inches
3. The minimum footing dimensions shall be 12 inches by 12 inches. (A 12" X 12" X 8" solid concrete pier block may be used in place of the concrete footing.)

Minimum Standard Footing for Rooms Constructed Over Existing decks:

The existing footing shall be excavated to allow the inspector to verify that it is adequate to support the additional construction.

Poured Wall Inspection:

(Have City approved plans on site.)

This is an inspection of wall forms to confirm that they are erected according to the engineer's design. The procedures are the same for each inspection although each design may be different depending on the size of the wall and the detail of horizontal and vertical reinforcing rods. The base of the wall is checked to make sure reinforcement is properly set and that the dowels from the footing are inside the forms. All reinforcement bars must be in place and secured to prevent their movement. A projection inspection may be performed at the same time. A foundation inspection is done after the walls are poured and the forms have been taken down. A visual check is made to verify the wall's integrity and to verify that anchor bolts are set correctly. An engineer's design is required for the wall when the soil is classified as having other than a low potential for shrink-swell.

Drainage System / Waterproofing Inspection:

(Have City approved plans on site.)

1. Waterproofing and a drainage system are required for all basements, storage spaces or habitable spaces below grade.
2. A drainage system is required when the inside grade of a crawl space foundation is lower than the finished outside grade.

Drainage system for crawl spaces:

1. Interior drains consist of draitile (usually 4 inch corrugated, perforated plastic pipe) installed below grade along the inside of the foundation wall. Also, crushed stone or gravel is placed below and above the draitile.
2. Exterior drains are installed on the top of the footing. Install 2 inches of crushed stone or gravel on top of the footing projection, then place the draitile and then an additional 6 inches of crushed stone or gravel on top of the draitile. Cover with a filter cloth.

Waterproofing for basements and habitable spaces:

The walls of the basement are required to have a coating of 3/8 inch Portland cement and a layer of a bituminous coating. Install a protective membrane over the coating, normally 6 mil plastic, to protect coating during backfill. Also, there are several approved, commercially available waterproofing systems available. Gravel and draitile requirements are the same as for an exterior crawl space drain.

Note: Drains must be run to daylight and drain by gravity.

Floor Slab Inspection:

(Have City approved plans on site.)

1. The area must be free of all vegetation, topsoil and foreign material.
2. Fill material must be free of vegetation and foreign material. The fill shall be compacted to assure uniform support, and shall not exceed 24 inches for clean sand or gravel and 8 inches for earth. If the fill exceeds these limits, an engineer's design is required.
3. The fill material must be a minimum of 4 inches thick.
4. A vapor retarder must be placed on top of the fill, except for garages, sheds, driveways, sidewalks, patios or other areas not likely to be heated later.

Monolithic Pour Inspection:

(Have City approved plans on site.)

This is a footing and a floor slab placed at the same time. Usually a monolithic pour is used for detached garages and sheds. It has the same requirements as footing and floor slab previously addressed.

Veneer Inspection:

(Have City approved plans on site.)

1. Sheathing must be nailed or stapled properly. Nail heads or staple crowns must not penetrate the sheathing surface. Braced wall panels and braced wall lines must be installed according to the approved plans.
2. If non-structural sheathing is being used, an approved wind bracing plan will be required and must be installed according to the approved plans.
3. The top and sill of all window and door openings must be flashed. Jamb flashing, if required by the window or door manufacturer, must be installed.

4. Exposed, non-treated wood studs and bands located behind masonry or stone veneer shall be covered with asphalt saturated building paper (building felt) or approved house wrap.

5. Bands, rim joists and sill plates abutted by decks, porches, steps, stoops and landings must be pressure treated.

6. Flashing is required where any exterior appurtenance is attached and where concrete or mortar abut a band or rim joist.

7. Weep holes and flashing are required for brick veneer above and below window and door openings, and beneath the first course of masonry above the foundation wall.

Note: Bright aluminum is not permitted for flashing; galvanized steel, coated aluminum or heavy vinyl are permitted to be used.

Masonry Fireplace Inspection:

1. The fireplace and its chimney must be constructed on footings of reinforced concrete at least 12 inches thick that extend at least 6 inches beyond each side and back of the fireplace.

2. After the firebox, smoke chamber and air inlet have been built, a throat inspection is required. The first flue liner may be set at the time of inspection. The fireplace must be constructed of solid masonry; the sides and back walls of the firebox when lined with firebricks must not be less than 8 inches. An unlined firebox must be 10 inches thick of solid masonry. Joints between fire brick must not exceed $\frac{1}{4}$ inch. The rear wall of the smoke chamber must not be less than 6 inches thick and parged with mortar on all sides. A 2-inch clearance from combustibles must be maintained.

3. The chimney must terminate at least 2 feet higher than any portion of the building within 10 feet, but it must not be less than 3 feet above the point where the chimney passes through the roof. The hearth extension shall be of noncombustible material. It must extend at least 16 inches in front and 8 inches on each side of a fireplace opening that is less than six square feet in size. If the fireplace opening is greater than six square feet, the hearth must extend a minimum of 20 inches in front and 12 inches on each side. Woodwork, mantle or other combustible materials must not be placed within 6 inches of a fireplace opening; wood may project $\frac{1}{8}$ -inch for each 1 inch of distance from the opening within 12 inches

Framing Inspection:

(Have City approved plans on site.)

1. All sub-trade rough-ins (plumbing, gas, mechanical and electrical) must be inspected and approved prior to the framing inspection.
2. If you have a masonry fireplace, the throat must have been inspected and then the fireplace completed prior to the framing inspection.
3. The building must be dried in. The ice shield and roof shingles must be complete and all doors and windows set.
4. All structural members, their sizes, spans and method of attachment are to be in accordance with the code and as shown on the approved plans.
5. Any framing member that has been cut or notched beyond allowances must be reinforced.
6. Every dwelling must have at least one side hinged exit door with the minimum dimensions of 3 feet wide by 6 feet 8 inches high. Every sleeping room (i.e., any room with a clothes closet) must have a window with the net clear opening of 5.7 square feet (5 square feet if the floor of the room in which the window is located is a grade level floor.). The window sill, as measured from the inside, shall be not more than 44 inches above the finished floor.
7. Glazing of windows and doors that are in hazardous locations must be safety glazing.
8. Fire blocking shall be in place. (At soffits, stairs, penetrations between levels.)
9. Stairs must be installed. The maximum tread rise shall be 8 1/4 inches. The minimum tread depth shall be 9 inches. Open risers are permitted, provided the opening between treads does not permit the passage of a 4 inch diameter sphere.
10. All attic areas shall be ventilated. Any attic area of at least 30 inches in height must have an access opening of 22-inches by 30-inches. A larger opening is required when equipment is located in the attic.
11. All wood sills that rest on concrete or masonry exterior walls and are less than 8 inches from exposed earth must be pressure treated.
12. Pre-fab fireplaces must be installed and will be inspected during the framing inspection. The manufacturer's installation instructions must be on site. The fireplace and chimney/vent must be installed according to the manufacturers

instructions and listing. The unit shall be secured to the framing members to provide clearance to combustible materials not less than set forth in the listing. The chimney/vent sections must be installed to provide proper clearance to combustibles and if the chimney/vent extends through a floor, ceiling or wall, a factory furnished fire stop and spacers must be installed. The hearth extension shall be of noncombustible material. It must extend not less than 16 inches in front of and at least 8 inches beyond both sides of the fireplace. The termination of chimney/vent and installation of the mantel must be accordance with the manufacturer's instructions.

Insulation Inspection:

(Have City approved plans on site.)

The framing inspection shall be approved prior to the insulation inspection. An exception is on additions and renovations when framing and insulation inspection can be done together. All exterior sidewalls and any nonaccessible ceilings must be insulated and inspected before concealment.

1. Minimum R-values of insulation shall be:

- Sidewalls R-13
- Basement Wall R-8
- Flat Ceiling R-38
- Sloped Ceiling R-38
- Under-floor R-19 (R-38 if the under-floor space is exposed to outside air.)
- Crawl Space Wall R-10 (non-vented crawl)
- Slab Perimeter R-5
- Under Cantilevers R-38

2. Insulation behind tubs and showers shall be installed before installing the unit(s).

3. Areas around doors and window frames shall be sealed; insulate around fireplace and chimney.

4. The space occupied by outside band boards between stories shall be insulated.

5. Ceiling insulation must not abut the underside of the roof sheathing (plywood). A one inch air space must be maintained in this location.

6. An approved vapor retarder must face the conditioned (warm-in-winter) side and be fastened or taped to each stud. Torn or missing vapor retarders must be repaired or replaced.

7. Insulation behind pre-fab fireplaces must have an approved fire-retardant vapor retarder. (i.e.; a flame spread rating not to exceed 25 and a smoke

developed rating not to exceed 450)

8. Batt type insulation must be marked with its R-value. The depth of blown-in attic insulation must be indicated by depth markers, provided for every 300 square feet of area.

Final Inspection:

(Have City approved plans on site.)

1. Handrails are required for stairways having four or more risers, and the height of the handrails shall be 34 to 38 inches measured vertically from the nosing of the stair tread.

- (Type I handrails): Handrails with a circular cross-section shall have an outside diameter of at least $1\frac{1}{4}$ inches and not greater than 2 inches. If the handrail is not circular, it shall have a perimeter dimension of at least 4 inches and not greater than $6\frac{1}{4}$ inches with a maximum cross section dimension of $2\frac{1}{4}$ inches.
- (Type II handrails): Handrails with a perimeter greater than $6\frac{1}{4}$ inches shall provide a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of $\frac{3}{4}$ inches measured vertically from the tallest portion of the profile and achieve a depth of at least $\frac{5}{16}$ inches within $\frac{7}{8}$ inches below the widest portion of the profile. This required depth shall continue for at least $\frac{3}{8}$ inches to a level that is not less than $1\frac{3}{4}$ inches below the tallest portion of the profile. The minimum width of the handrail above the recess shall be $1\frac{1}{4}$ inches to a maximum $2\frac{3}{4}$ inches. Edges shall have a minimum radius of .01 inches.

2. Guardrails are required for open sides of stairways and around porches, balconies or raised floors surfaces when the distance to the ground or to another floor is more than 30 inches. Intermediate rails or ornamental rails of a guardrail must be constructed so they do not allow a 4-inch sphere to pass between them, except that required guardrails for stairs shall not allow passage of a $4\frac{3}{8}$ inch sphere. Required guardrails for balconies or raised floors must not be less than 36 inches in height. A guardrail, when being used as a handrail, for an open side of a stairway must not be less than 34 nor more than 38 inches in height measured vertically from the leading edge of the tread.

3. A stairway shall not be less than 36 inches in clear width at all points above the handrail. The headroom in all parts of the stairway must not be less than 6 feet 8 inches measured vertically from the plane of the tread nosing. The steps must have a minimum tread depth of 9 inches (from nosing to nosing) and a maximum rise height of $8\frac{1}{4}$ inches; variations of tread depth or rise height within the flight of stairs shall not vary more than $\frac{3}{8}$ of an inch. Open risers are permitted, provided the opening between treads does not permit the passage of

a 4 inch diameter sphere.

4. An attached garage must provide protection from the spread of fire as follows:

- Garage ceilings below habitable space above must be protected by 5/8 inch type X gypsum board applied to the underside of the garage ceiling joists.
- The supporting elements of a floor-ceiling assembly supporting habitable space above a garage shall be protected by minimum 1/2 inch gypsum board.
- Doors opening from the garage to a sleeping room are not allowed.
- Openings between the garage and house must be equipped with either a solid wood door of not less than 1 3/8 inch in thickness or 20 minute fire-rated doors.
- The garage floor surface must be of noncombustible material, and shall slope toward the vehicle door opening.

5. A smoke detector is required in each bedroom, plus outside each sleeping area in the immediate vicinity of the bedroom and on each floor of the house including the basement but not the crawl space or uninhabitable attic. All smoke detectors shall be interconnected. The power for the smoke detectors must be from the house wiring and battery back up.

6. Yards must be graded to have surface water to drain away from the house, a minimum of 6 inches fall in the first 10 feet. Where lot lines or other physical barriers prohibit 6 inches of fall within 10 feet, drains or swales must be provided to achieve adequate drainage.

7. The crawl space must meet the requirements of items 2, 3 and 4 as listed under "Foundation Inspection." Crawl spaces must be free of wood and debris. All floor insulation must be installed with its vapor retarder turned toward the conditioned side. Any penetrations in the foundation wall must be sealed.

8. The attic must meet the requirements of item 10 as listed under "Framing Inspection." The attic must be properly cross-ventilated to allow free air movement. Insulation must be properly installed. Any attic with flooring and having a permanent stairway must have handrails and guardrails at the stairway.

9. Bathroom exhaust fans must be vented to the outside through the soffit or side wall and must be terminated at an approved vent terminal.

10. Roof drainage, such as gutters and down spouts, is required in areas with other than low shrink swell potential. Down spouts are required to extend a minimum of 5 feet from the house.

11. Wood siding, sheathing and wall framing on the exterior of a building must be a minimum of 6 inches from the ground surface. Any structural untreated post or column must be supported by a metal stand off.

12. All decks, stoops, and porches attached to a house must be bolted to a pressure treated band board with minimum ½ inch bolts placed in a staggered pattern, at 1 foot on center.

13. Interior finish material must meet flame spread requirements of the code. The vapor retarder on batt insulation left exposed in unfinished areas must have a maximum flame spread rating of 25. Foam plastic materials must not be exposed to the interior, attic or crawl space.

14. All egress ramps shall have a maximum slope of not more than one in eight. Handrails are required on one side of ramps exceeding a slope of one in twelve. A 3-foot by 3-foot landing must be provided at top and bottom of ramps, where doors open onto the ramp, and where the ramp changes direction.

15. The under-floor area of all cantilevers and heated rooms built on piers or posts must be sealed and insulated with R-38.

16. Window and door glass located in specific hazardous locations must be safety glazing.

17. All finished space shall be shown on the City approved plans.

Final Pool Inspection:

(Have City approved plans on site.)

Pools and spas with circulation outlets shall be provided with entrapment protection. All outdoor private swimming pools, including in ground, above ground and on ground pools, hot tubs, and spas must be provided with a barrier. The barrier must comply with the following:

1. The top of the barrier (fence) shall be at least 48 inches above the finished ground level, measured from the outside.

2. All gates must be self-closing and self-latching and must close from the outside toward the pool.

3. If a wall of the house will serve as part of the barrier, (1) any door in that wall must be equipped with an alarm or (2) any door in that wall must be self closing and self latching with the release mechanism located at least 54 inches above the floor and the door must swing away from the pool area or (3) the pool has to be equipped with a power safety cover.

Pool Barrier Inspection:

(Have City approved plans on site.)

The final pool inspection will include a verification that the required barrier (fence) is in place. If a contractor is installing the pool, the final inspection cannot be approved unless a barrier is in place. If the contractor who is installing the pool will not be providing the barrier, the owner will be responsible for the barrier.