

SECTION 2 - ROADWAYS

2-1 Continuity of the Public Road System

The continuity of a publicly maintained system is a prerequisite to the addition of any street into the County road system. A road or street may only be accepted for maintenance into the system if it is the continuation of the network of public streets whose maintenance has been officially accepted by the County or, if appropriate the Virginia Department of Transportation.

A street may only be accepted into the County road system if it renders sufficient public service to justify the expenditure of public funds for its subsequent maintenance. For the purpose of these requirements, public service may include, but is not necessarily limited to, one or more of the following situations:

- Provides an extension of a road to the subdivision boundary or parcel to facilitate the continuity of possible adjacent development.
- Serves as access to a public school, a County owned public recreational facility or other similar facility open to public use.
- Provides access to single family lots in a platted subdivision.
- Is identified on the County Major Thoroughfare Plan.
- Provides widening of existing streets and roads where necessary.

2-2 Establishing a Public Right-of-Way

Public roadways that are constructed for ultimate acceptance into the County road system can be established through one of two methods:

- Hearing of Necessity before the Board of Supervisors
- Dedication of Right-of-Way with a Subdivision Plat

Hearing of Necessity before the Board of Supervisors

The establishment of a roadway with the Hearing of Necessity process is one that is normally utilized by the County in the furtherance of its Capital Improvement Program.

The Board of Supervisors initiates the process by requesting the Director of Public Works to prepare a report (i.e. Letter) describing the need (Necessity) for a specific project. This "Letter of Necessity" is filed with the Board and the Board holds a Public Hearing on the Letter and the project. The Board of Supervisors, after receiving the Letter, and hearing the public, makes a decision on the merits of the project (See Code of Virginia 33.1-230 *et seq.* for additional details).

While the above indicates the normal process when non-federal funds are used for the construction of roadways in the County, it should be noted that as allowed under 33.1-216 of the Code of Virginia, the County is permitted to fully comply with rules and regulations which may be in conflict with the Letter of Necessity process, when federal-aid funds and contracts are involved. Use of such funds requires a process for public involvement much greater than that provided by the Letter of Necessity.

Dedication of Right-of-Way with a Subdivision Plat

The establishment of a roadway through right-of-way dedication with a subdivision plat is the process that is used by developers. The development of the plat shall be in accordance with Chapter 19 of the County Code.

Construction plans for the proposed roadway shall be developed in accordance with this Manual and Chapter 19, Article II of the County Code. The development and submittal of construction plans for the road may take place at any time after the approval of the preliminary plat by the Henrico County Planning Commission.

The construction plans will be reviewed by the Department of Public Works. If the plans are determined to be in compliance with the standards, the Director of Public Works will authorize the construction of the road through the approval of the plans. After the plans are approved by the Planning Office and the Department of Public Utilities, a pre-construction meeting must be scheduled by the Environmental Division prior to the beginning of any construction.

The roads must be inspected by the Department of Public Works throughout the construction process. The developer may request a final inspection at such time that he believes he has completed the construction of the roads. See Section 4 of this Manual for additional information concerning the inspection process and the acceptance of the roads into the County System.

2-3 Road Functional Classification

Roadway functional classification is one of the tools utilized in the determination of the road design for a County road or road project. The function of a road is determined by

the volume of traffic, length of vehicle trips using the road and whether the road provides service primarily for vehicular movement or access to abutting land uses.

Normally the arterial roadways will carry significantly higher traffic volumes and a variety of traffic types at greater speeds than on collector roads. Similarly collector roads will carry higher traffic volumes at higher speeds than local roads.

All roadways within the County are classified as to their function. The Department of Public Works utilizes the functional classification of a road along with the existing and projected traffic volumes that are anticipated to be using the road to determine the design features and requirements of the road.

2-4 Major Road Policy

Any development or land being developed which is dissected by a major roadway with a planned ultimate cross section of four or more lanes, shall be required to dedicate the right-of-way for the entire cross section of the road (or all of that portion of the planned right-of-way that is located on the land).

The developer is not required to construct any portion of the roadway as long as the road is not required for access to the development.

The developer shall be required to build one half of the roadway cross section, including one half of the median, if applicable, and any related drainage facilities for the ultimate road section if the road is required to provide access to development on one side of the roadway. The Director of Public Works may authorize the cost of the median work or drainage work to be escrowed if the installation of the facilities are impractical at the time.

The developer shall be required to build the entire ultimate roadway cross section, including the median if applicable, and any related drainage facilities if the road is required to provide access to development on both sides of the roadway.

Roads intersecting with the unimproved right-of-way shall include the ultimate drainage, pavement design, grade, and traffic control considerations in the design.

Right-of-way dedication, based on the ultimate road right-of-way width, shall be provided along those sides of the lots where road improvements are not to be made as a part of the development.

Preliminary construction plans for the major road shall be prepared for the above grading, to allow the lot layout, dwelling location and orientation of the development to

take the ultimate road into consideration and to determine if slope easements need to be dedicated as a part of the development.

2-5 Road Improvements for Double Frontage Lots

Double-frontage lots shall be permitted only in those areas as defined in Section 19-115 of the County Code or by exception as otherwise permitted in the County Code.

Where double-frontage lots are permitted to back up to an expressway, toll road or major street and an easement is provided to prohibit access to or from the lots, the responsibility for the completion of road improvements shall be along those sides of the lots where access is permitted. Road improvements will not be required on the major road except on those lots whose side yard abuts the major road. In such cases, road improvements shall extend along the side yard of the lot as well as along those sides of the lot where access is permitted.

Right-of-way dedication, based on the ultimate road right-of-way width, shall be provided along those sides of the lots where road improvements are not to be made as a part of the development.

The unimproved right-of-way shall be cleared, grubbed, rough graded and seeded as a part of the development. Preliminary construction plans for the road shall be prepared for the above grading, to allow the lot layout, dwelling location and orientation of the development to take the ultimate road into consideration and to determine if slope easements need to be dedicated as a part of the development

The developer shall be responsible for the completion of all road improvements adjacent to the lot, including the road where an easement is provided to prohibit access, if the use of a double frontage lot is granted to make practical use of the land or for any other reason if the adjacent road is not classified as an expressway, toll road or major road.

2-6 Orphan Roads

Orphan road projects involve the improvement of an existing unmaintained right-of-way to provide a roadway that meets County standards which is accepted into the County road system.

Numerous unmaintained County public rights-of-way exist, however; orphan road projects are considered only to serve existing residential development. An orphan road project will not be considered to serve new development.

A minimum right-of-way of 50 feet must exist along the corridor for a right-of-way to be considered for orphan road funding. If less than 50 feet of right-of-way exists, the adjacent property owners must dedicate the necessary additional land to the County to provide the minimum width.

Funding must be available for the orphan road project and all orphan road projects must be approved by the Board of Supervisors.

2-7 Right-of-Way

A clear and unencumbered right-of-way shall be dedicated for public use for all proposed roadway additions to the County roadway system. Related easements for drainage, water quality, traffic devices and all others necessary to support the proposed roadway are required to be dedicated for public use in a form acceptable to the County Attorney and the Department of Public Works.

Right-of-Way Radius

Right-of-way radii are required at the beginning of all roadway curves and shall end at the tangent point on all roadways.

Property/Right-of-Way Lines at Street Intersections

Property/right-of-way lines at roadway intersections shall be rounded. The radius shall have a dimension that is 5 feet less than the radius on the face of curb or edge of pavement on the adjacent roadway. A typical detail of this relationship is identified in Appendix C. A right-of-way chord may be required, rather than a radius, when in the opinion of the Traffic Engineer, a right-of-way chord (30' minimum) is necessary. Right-of-way chords, where required by the Traffic Engineer at intersections of public roadways, shall extend from point of curve to tangent point for the corner of the intersection.

Standard Cul-de-Sac

Cul-de-sacs are required at the end of all dead end streets. Cul-de-sac streets shall terminate in a circular right-of-way. The size of the cul-de-sac is based on the road classification and width of the road that is terminated. Details

regarding size of cul-de-sac that is to be used are identified in Section 2-22 and in Appendix C.

Temporary Turnaround Easements

Construction of a temporary turnaround area is required whenever a stub street extends more than one lot width from a corner or more than one lot fronts on the stub street on either side of the road. All temporary turnarounds or temporary cul-de-sacs shall include a temporary turnaround easement. Details and additional information for temporary cul-de-sacs are provided Section 2-24 in Appendix C. When a temporary cul-de-sac is no longer required because of a road extension, the developer of the road being extended shall be responsible for removing the temporary cul-de-sac and extending the road and property components (curb and gutter, gravel driveways, paved driveways, sidewalks, mailboxes, etc.) to the new road section and regrading areas to finished contours acceptable to the adjacent property owners and the County.

Widths of Right-of-Way

The minimum right-of-way for streets to be accepted into the County Road System is based on functional classification.

Typical Roadway Sections for these rights-of-way are shown on the Typical Section Details, in Appendix B.

2-8 Right-of-Way Monuments

Right-of-way monuments shall be installed in conformance with Section 19-141 of the County Code. Monuments must be installed at all breaks in the right-of-way line including angle points, radial points and at the beginning (PC) and end (PT) of curves. In addition, monuments must be installed at intervals on tangents so as to be visible from each monument, but not more than 2,400 feet apart.

Monuments are to be set in accordance with the County standard detail located in Appendix C, with an accuracy of 1:20,000 (2nd order, class 2).

The replacement of any monuments removed or destroyed during the development of the subdivision shall be the responsibility of the subdivider.

2-9 GIS Requirements

All plans and plats which are submitted for review and approval must include four coordinate points derived from the County Geodetic Control Network (GCN). The plan or plat must identify the location of any GCN monuments that are located on the site. All measurements on the plan must be tied to the four coordinate reference points.

Monuments shall conform to the County standard detail located in Appendix C in this Manual. Specifications for installation and accuracy required for the placement of GPS monuments can be found in the latest edition of the Henrico County GPS Control Network Book.

2-10 Encroachments and Extrinsic Structures on the Right-of-Way

Posts, Walls, Signs, Structures

Posts, walls, and signs as permitted in Chapter 24, Section 104 of the Henrico County Code or similar ornamental structures that do not interfere with roadway capacity, traffic safety or sight distance may be permitted within the right-of-way.

Specific authorization by a permit, issued by the Department of Public Works, is a requisite for these devices or any other encroachment to be located within the right of way. A Maintenance Agreement must be entered into with the Department of Public Works before work takes place on the right-of-way.

No permanent or semi-permanent structure will be permitted to be constructed over or directly adjacent to a storm water drainage pipe or structure.

An approved sign permit for the specific sign in question will satisfy this authorization requirement for placement of a sign on the right-of-way. A written request, providing all necessary details, must be made to the Director of Public Works for all other planned or proposed encroachments.

The maintenance of an approved sign, structure or facility shall be the responsibility of the developer or the permit applicant. The sign or structure will be removed from the right-of-way if it is not maintained in a manner that is satisfactory to the Director of Public Works.

Landscaping and Irrigation

Landscaping on the right-of-way may be permitted provided the landscaping does not create sight distance problems, introduce safety hazards, and does not introduce

potential damage to the road and drainage system infrastructure. Plantings which bear fruit, nuts or seeds that, when dropped, will interfere with or impede storm water drainage flow shall not be permitted.

Irrigation systems may be permitted to be installed on the right-of-way provided that underdrains are installed to keep water from ponding or becoming trapped near or under the roadway.

Plans and specific details outlining the proposed landscaping, irrigation system and/or underdrains that are to be installed shall be approved by the Department of Public Works. Specific written authorization by the Director of Public Works shall be obtained and a Maintenance Agreement must be entered into with the Department of Public Works before work takes place on the right-of-way.

The review and approval of landscaping plans that are part of an overall landscape plans for a development shall be coordinated with the Planning Office.

2-11 Spite Strips

Plans that include a reserved strip or “spite strip” which prohibits otherwise lawful vehicular access to a road from adjacent properties shall be prohibited.

Planting strip easements that are required as a part of a development to control access to a major street shall not be considered spite strips provided that alternate access is permitted to the parcel or lot in question (see also Section 19-115 of the County Code).

2-12 Typical Road Section Requirements

All construction will be in accordance with the most recent edition of: (1) Virginia Department of Transportation Road and Bridge Specifications; (2) Virginia Department of Transportation Road Designs and Standards, except as noted in this Manual.

See Appendix B of this Manual for typical road section requirements.

2-13 Design Speed

Design Speed is the maximum safe speed that can be maintained over a specified section of roadway. For all roads with an anticipated posted speed limit of 30 miles per hour (mph) or less, the design speed shall be 5 mph over the posted speed limit. For roads with an anticipated posted speed of 35 mph or greater, the design speed should be 10 mph over the posted speed limit.

2-14 Sight Distance

Two types of sight distance exist for the design of roads:

- Stopping Sight Distance
- Intersection Sight Distance

Stopping Sight Distance

Stopping sight distance is the sum of two distances: the brake reaction distance and the braking distance. The brake reaction distance is the distance a vehicle travels from the time a driver sees an object requiring a stop to the moment the brakes are applied. The braking distance is the distance a vehicle travels from the moment the brakes are applied, until it comes to a stop condition. Stopping sight distance is used for the design of vertical curves. In computing and measuring the stopping sight distance, the 3.5-foot eye height and 2.0 foot object height criteria are used. The following table shows the stopping sight distance for various speed limits.

Stopping Sight Distance

	DESIGN SPEED						
	30 mph	35 mph	40 mph	45 mph	50 mph	55 mph	60 mph
Stopping Sight Distance	200'	250'	305'	360'	425'	495'	570'
<p>From – <i>A Policy On Geometric Design Of Highways And Streets</i>, 2001, Exhibit 5-2, page 385, Design Controls for Stopping Sight Distance and for Crest and Sag Vertical Curves.</p>							

Note: Assumes wet pavement

Intersection Sight Distance

Intersection sight distance allows for the safe maneuver of a vehicle from the stopped position at an intersection even though an approaching vehicle comes into view on the intersecting road as the stopped vehicle begins its departure. In computing and measuring the intersection sight distance, the 3.5 foot eye height and 3.5 foot object height criteria are used. The following table shows the minimum intersection sight distance for various posted speed limits.

Intersection Sight Distance

ROAD WIDTH (FEET)	POSTED SPEED LIMIT							
	25	30	35	40	45	50	55	60
24	280'	335'	390'	445'	500'	555'	610'	665'
30	280'	335'	391'	446'	502'	558'	614'	669'
36	282'	338'	395'	451'	508'	564'	620'	677'
40	288'	346'	403'	461'	519'	576'	634'	691'
52	294'	353'	412'	471'	530'	588'	647'	706'
67	313'	375'	438'	500'	563'	625'	688'	750'
<p>From - A Policy on Geometric Design of Highways and Streets, 2001, page 665, Design Intersection Sight Distance, Case B1, Left Turn From Stop</p>								

2-15 Horizontal Curves

When tangent centerlines deflect from each other more than one degree (1°) and are not forming an intersection, they shall be connected by a curve with a minimum centerline radius of 300 feet and a minimum centerline length of curve of 100 feet for local residential roads. Residential roads are not required to have superelevation. Residential roads intersecting any road shall have a tangent section of centerline at least 50 feet in length measured from the right-of-way line of the intersecting road.

When tangent centerlines on arterial and collector streets deflect from each other more than one degree (1°) and are not forming an intersection, they shall be connected by a curve with a minimum centerline length of curve based in the data in the following curve table.

Prior to initiating the design of a road, the engineer should contact the Department of Public Works regarding the degree of superelevation that will be permitted on the specific road. The determination as to whether superelevation will be permitted will be based on the functional classification of the road as well as drainage characteristics and considerations. The maximum superelevation allowable is 0.04 foot/foot.

Degree of Curve and Minimum Radius for Roads

Normal Crown Section

	DESIGN SPEED						
	30 mph	35 mph	40 mph	45 mph	50 mph	55 mph	60 mph
Degree of Curve	1° 55'	1° 26'	1° 09'	0° 57'	0° 43'	0° 34'	0° 34'
Radius	3,000'	4,000'	5,000'	6,000'	8,000'	10,000'	10,000'

From – *A Policy On Geometric Design Of Highways And Streets*, 2001, Page 157, Exhibit 3-21, Values for Design Elements Related to Design Speed and Horizontal Curvature.

At Maximum Superelevation ($e_{max} = 0.04$)

	DESIGN SPEED						
	30 mph	35 mph	40 mph	45 mph	50 mph	55 mph	60 mph
Degree of Curve	19° 06'	13° 39'	10° 08'	7° 51'	6° 10'	4° 49'	3° 48'
Radius	300'	420'	565'	730'	930'	1,190'	1,505'

From – *A Policy On Geometric Design Of Highways And Streets*, 2001, Page 157, Exhibit 3-21, Values for Design Elements Related to Design Speed and Horizontal Curvature.

A tangent is not required between reverse curves on local residential streets. On all roads with superelevation, a minimum tangent of 200 feet will be required.

2-16 Vertical Curves

Vertical curves may be either crest or sag. The maximum vertical grade permitted on a designated arterial or major collector road is 5 percent. On all other roads the maximum grade is 8 percent. The minimum grade for all streets shall be 0.50%. See section 2-24 of this Manual for minimum grades on curb and gutter within cul-de-sacs. The following table provides vertical curve data for each design speed.

DESIGN CONTROLS FOR VERTICAL CURVES

Sag Vertical Curves	DESIGN SPEED						
	30 mph	35 mph	40 mph	45 mph	50 mph	55 mph	60 mph
K	37	49	64	79	96	115	136

From – *A Policy On Geometric Design Of Highways And Streets*, 2001, Exhibit 5-2, Page 385, Design Controls for Stopping Sight Distance and for Crest and Sag Vertical Curves.

Crest Vertical Curves	DESIGN SPEED						
	30 mph	35 mph	40 mph	45 mph	50 mph	55 mph	60 mph
K	19	29	44	61	84	114	151

From – *A Policy On Geometric Design Of Highways And Streets*, 2001, Exhibit 5-2, Page 385, Design Controls for Stopping Sight Distance and for Crest and Sag Vertical Curves.

Notes: K = Rate of Vertical Curvature

K factor based on minimum sight distance

Sag Vertical Curves sight distance based on headlight sight distance.

2-17 Tapers

A taper is required to move traffic into a different travel path to provide for a turn lane or when a lane merge is required. The following table specifies minimum taper lengths required on a roadway.

MINIMUM TAPER LENGTHS							
POSTED SPEED LIMIT (MPH)	WIDTH OF OFFSET OF THROUGH LANES						
	6 FT	7 FT	8 FT	9 FT	10 FT	11 FT	12 FT
25	63'	73'	83'	94'	104'	115'	125'
30	90'	105'	120'	135'	150'	165'	180'
35	123'	143'	163'	184'	204'	225'	250'
40	240'	280'	320'	360'	267'	293'	320'
45	270'	315'	360'	405'	450'	500'	550'
50	300'	350'	400'	450'	500'	550'	600'
55	330'	385'	440'	495'	550'	605'	660'

2-18 Points of Access

Any new subdivision with more than 50 single family lots shall have a minimum of two separate permanent points of access onto public roads. If construction of a subdivision is to be phased, the second point of access must be provided before the total number of issued building permits in the subdivision exceeds 50.

2-19 Intersection Design

All roads intersecting another road shall do so at an angle of 90 degrees unless otherwise approved by the Traffic Engineer.

The minimum offset between centerlines of intersecting roads shall be not less than 150 feet on local residential and minor collector roads (Section 19-105 of the County Code). For major collector and arterial roads, offsets shall be not less than 250 feet.

On local roads, a vertical curve equivalent to the superelevation or crown of the intersecting road shall be provided for a distance of 50 feet. For residential streets internal to a subdivision, a vertical curve equivalent to the superelevation or crown of the intersecting road shall be provided for a distance of 25 feet for a street with curb and gutter, and 35 feet for a street without curb and gutter

The curb radius or radius on the edge of pavement on all public roads intersecting other public roads designated as collector or arterial roads shall be a minimum of 35 feet. The curb radius or radius on the edge of pavement at all intersections of two public roads designated as residential roads shall be a minimum of 25 feet.

Sight distance easements shall be identified and shown at all street intersections and noted on the subdivision plat, if deemed necessary to provide adequate sight distance at an intersection. These easements will remain free of all structures, trees, shrubbery, and signs, except utility poles, fire hydrants, and traffic control signs.

2-20 Turn Lanes

Left and right turn lanes are required at all entrances and public roads on four or more lane divided roadways. Turn lanes may be required on all other roads as determined on a case-by-case basis by the Traffic Engineer. This will be based on type of development, location, classification of roads, and other factors. Pavement design of the turn lane shall be the same as the through lanes of the roadway. Left-turn lanes shall have a minimum width of 10 feet if constructed in the median of a divided roadway, and 12 feet at all other locations. Right-turn lanes shall have a width of 12 feet. See Appendix B and C for additional information concerning turn lane design.

The minimum turn lane size is as follows:

Left turn lane: 150 feet of full storage; 150 feet of taper
Right turn lane: 150 feet of full storage; 100 feet of taper

Longer turn lanes may be required if determined to be needed by the Traffic Engineer.

2-21 Raised Median Design

Raised medians may be placed at subdivision entrances or can be used to create a divided roadway through a subdivision. All medians greater than 6 feet in width shall have a grass median and may have additional landscaping if approved by the Department of Public Works, and a Maintenance Agreement from a homeowners association or other group is provided. Any median less than 6 feet shall be constructed of concrete. All sight lines must meet the minimum criteria as stated in Section 2-14 of this Manual.

Raised medians at subdivision entrances designed for the expressed purpose of identifying and/or beautifying a subdivision entrance will be permitted only on a leg of the intersection that is/will be controlled by a stop condition.

The minimum crossover spacing on a road with a continuous median is 800 feet.

2-22 Cul-de-Sac

Cul-de-sacs are required at the end of all dead end streets.

The size of the cul-de-sac is based on the road classification and width of the road that is being terminated. Details regarding the right-of-way and pavement radius that are to be used are identified in Appendix C.

A shoulder width of 4 feet shall be provided around the cul-de-sac to insure that the roadside ditch remains with the right-of-way where the right-of-way of the cul-de-sac has a 50-foot radius and a roadway with no curb and gutter is proposed.

A modified cul-de-sac may be used if desired on residential streets with a road section identified as classification IV or less. Any deviation from the standard cul-de-sac as stated above must meet the minimum design criteria of the modified design cul-de-sac as shown in Appendix C. Other alternative cul-de-sac designs will be considered on a case-by-case basis. A Maintenance Agreement acceptable to the Department of Public Works must be provided between the developer or the homeowner's association and the Department of Public Works for landscaping and maintenance of the island within the modified cul-de-sacs.

If adjacent property is undeveloped and the future continuation of the proposed street is necessary for convenient movement of traffic representing the best overall traffic pattern, then a temporary cul-de-sac shall be provided. See Section 2-7 of this Manual for additional information concerning Temporary Turnaround Easements.

2-23 Roadway Shoulder Design

Shoulders for roads shall be graded to drain. Slopes and widths shall be in accordance with roadway typical cross-section details for the road classification contained in this Manual. See Appendix B for additional details relating to road shoulders.

Grassed Shoulders

Topsoil shall be provided on grassed shoulders to a minimum depth of 2 inches. Shoulders shall be seeded and fertilized in accordance with VDOT Road & Bridge Specifications and Standards.

Gravel Shoulders

Gravel shoulders may be approved for industrial access roads and on special exception on other roads by the Department of Public Works. Construction shall be in accordance with Road Section Design Standards in this Manual and the design requirements specified at the time of approval.

Side Slopes on Roads

Side slopes in cut or fill sections shall be 2:1 or flatter. Steeper slopes may be approved by the Director of Public Works.

2-24 Curb and Gutter

General

All curb and gutter shall be constructed in accordance with the County of Henrico standard details located in Appendix C in this Manual.

Accessibility Requirements

All roadway construction shall incorporate a means of access for persons with mobility impairments.

Curb cuts shall be provided at all intersections. A combination curb cut and curb ramp shall be provided where sidewalks exist or are to be provided.

One curb cut or combination curb cut and curb ramp is to be provided at each pedestrian crossing at the intersection, where feasible. Curb cuts and combination curb cuts and curb ramps are to be installed at a location that is perpendicular to the street that is to be crossed. The bottom of the ramp run, exclusive of the flared sides, shall be located within the existing or planned crosswalk or at the point where pedestrian crossings are expected to occur.

Diagonal curb cuts or combination curb cuts and curb ramps are not permitted for new construction.

Curb cuts and combination curb cuts and curb ramps shall conform to VDOT Road and Bridge Standard CG-12B and Section 502 and 504 of the VDOT Road and Bridge Specifications. Matching curb ramps shall be provided at all corners of an intersection.

A typical detail of curb ramp locations is included in Appendix C.

New Development

Curb and gutter shall be installed on both sides of each street in the subdivision in accordance with Section 19-143 of the County Code and with County design standards and specifications. Curb and gutter shall be installed on both sides of each road in the subdivision if:

- any block of any road is constructed with a grade of 0.5% or less within the block
- 25% of the roads within a subdivision have a grade of 1.0% or less
- 25% of the lots in the subdivision have a street frontage of less than 80 feet.

Either standard “barrier type” curb and gutter or roll face curb and gutter may be used on residential roadways (Typical Road Sections I, II, III, IV, V). The type of curb and gutter that is used must remain the same for the entire length of the road. Standard “barrier type” curb and gutter shall be installed on collector and arterial roadways where curb and gutter is required.

When curb and gutter is required on a street, curb and gutter shall also be provided around the perimeter of any temporary cul-de-sacs, unless definitive plans exist to extend the street within the next twelve months.

Construction Staking

Curb and gutter, storm sewer and related drainage structures installed on existing County maintained roads shall be staked by the Department of Public Works upon request. Curb and gutter will not be staked until all conflicts are resolved within the right-of-way. Utility poles must not be located in conflict with existing or future sidewalk shelf areas or sidewalk locations.

Curb and gutter and related drainage facilities on new subdivision roads will not be staked by the County. The developer shall be responsible for staking the curb and gutter for the new road in conformance with the approved plans. The Department of Public Works will perform inspections of the curb and gutter and road construction as the staking and construction proceeds.

The minimum allowable grade for County roadways is 0.5 % on continuous grade. The minimum allowable grade on curb and gutter within a cul-de-sac is 1.0%. Curb and gutter, storm sewer and related improvements installed on VDOT maintained roads will not be staked by the County. There will be a restaking fee for any stakeout that is destroyed by persons other than County forces.

Pavement Widening with Curb and Gutter Installation on Existing Roadways

If a property owner wishes to install curb and gutter along the road frontage, the installation location must be approved based on the road functional classification. The County will provide the necessary pavement widening to tie the new curb and gutter to the existing roadway. The County will not provide pavement widening to the new curb and gutter for Plans of Development, subdivisions or building permits.

The minimum pavement design shall be based on the classification of that roadway as defined by the Department of Public Works and the County Code. The new pavement shall be equal to or better than the existing pavement.

2-25 Sidewalk

A sidewalk shall be installed on at least one side of all collector and arterial roadways located within a 1 mile radius of an existing school, park or other public facility. The sidewalk will be placed on the side of the road which is most beneficial to pedestrians. This will be determined by the Department of Public Works.

All sidewalks should be constructed of concrete and have a minimum width of 4 feet. A 2-foot utility strip shall be provided between the back of curb and the sidewalk. A pedestrian passing area, conforming to VDOT guidelines, must be provided at minimum intervals of 200 feet. Entrances and street intersections may substitute for and satisfy the requirement for passing areas along a sidewalk section. Appendix B and C provide additional details regarding sidewalk design.

Sidewalks shall have a minimum width of 5 feet when pedestrian passing areas are not provided or when an exception is granted to eliminate the 2-foot utility strip and install the sidewalk flush with the back of curb.

Additional right-of-way shall be dedicated to encompass the entire sidewalk should insufficient right-of-way exist.

See Section 2-24 of this Manual for information regarding accessibility requirements for pedestrians at intersections.

2-26 Pavement Design

The pavement design for all streets and commercial / industrial access roads shall be in accordance with the appropriate road classifications shown in the Typical Sections. Pavement Design Standards included in Appendix B of this Manual. The pavement designs are based on a minimum CBR value of 10 and set forth the minimum pavement design requirements for each road classification. The pavement designs shall be considered preliminary designs, **not approved for construction**, until substantiated by acceptable test results of the actual subgrade soil. Approval of the final design shall be obtained prior to the construction of the pavement.

Field sampling of the subgrade soil shall be required to determine the actual CBR value, resiliency factor and other characteristics to verify the adequacy of the pavement design in relationship to the existing soil. If the test results reveal that the pavement design is less than adequate, adjustments to the pavement design shall be required.

Adjustments to the minimum required pavement designs shall be made in accordance with the latest edition of the VDOT Manual Pavement Design Guide for Subdivision and Secondary Roads in Virginia. The maximum vehicles per day, as shown for the appropriate road classification, shall be used as the Design ADT in the nomograph to determine the Thickness Index for the pavement and for any adjustments to the minimum pavement design requirements. Reductions to the minimum required pavement designs will not be considered. All CBR values are to be determined in accordance with "The Virginia Test Method for Conducting California Bearing Ratio Tests" (Designation VTM-8).

Upon request from the developer, the Department of Public Works will obtain field samples and perform the required CBR tests at no cost to the developer; or the developer may obtain the services of an independent testing firm to perform the tests and submit certified results and pavement recommendations to the County for review. Soil samples should be taken when the earthwork is within 0.1' from finished subgrade. The developer's construction schedule should take into account that the test results are normally available in approximately 10 days.

The pavement design determination process assumes that the properly compacted subgrade soil will produce a stable platform for pavement construction. If an unsuitable subgrade (wet, soft, unstable or unsuitable material) is encountered, it must be undercut to a firm foundation and replaced with adequately compacted material of suitable quality. Prior to the placement of the subbase / base layer, the subgrade must be inspected by the Department of Public Works for grade, compaction and proof-rolled. Additional inspections shall be required on each subsequent pavement course.

The use of soil stabilization fabrics in County roadways must be approved by the Director of Public Works. The soil stabilization fabric will not be considered as a substitute for undercut needs, nor will it be considered as added structural value in the pavement design.

In the preliminary design phase of development, the engineer shall take into consideration all possible road extensions, "Growth Rates", where applicable, and the percent of "Heavy Commercial Vehicles" to determine appropriate adjustments in the design ADT to calculate the road design as required in the VDOT Manual.

In addition to the underdrains that are required in the road construction as detailed in Section 3-12 of this Manual, standard UD-2 underdrains with outlets are required in all raised grass medians to prevent water infiltration through or under the pavement structure. Longitudinal pavement edge drains, Standard UD-4 with outlets to provide for lateral drainage, are also required in all road classifications with a design ADT of 1,000 vehicles per day or greater.

2-27 Vertical Clearances

All overhead lines within the public rights-of-way shall be in accordance with latest edition of the National Electrical Code.

2-28 Guardrail

General

Guardrail shall be provided and installed by the developer where necessary for the safety of the traveling public, as well as protection for adjacent properties. The need for guardrail should be determined at the early stages of design to ensure that road sections are designed with enough width to facilitate the guardrail installation and that drainage pipes have sufficient cover for the installation of posts and are extended to accommodate the necessary adjustments in the embankments and slopes.

Warrants

A traversable recovery area for vehicles should be provided beyond the traveled way (edge of pavement) whenever possible. Ideally, this recovery area or "clear zone" should be free of obstacles such as non-traversable drainage structures, steep slopes, and unyielding fixed objects that can cause accidents and result in injuries to motorists. In locations where it is not feasible to remove these obstacles from the clear zone, guardrail may be required in order to adequately protect motorists.

The following minimum guidelines for guardrail installation are based on AASHTO Roadside Design Guide and VDOT Road Design Manual. However, it should be noted that guardrail may be required in some locations that do not necessarily meet these

criteria based on the judgement of the Traffic Engineer. Such factors as traffic volumes, speed of traffic, accident history, road curvature, slopes of recovery area, presence of curb and gutter, location of trees, utility poles, etc. must all be taken in consideration when determining if guardrail is warranted in a particular location.

Guardrail is typically required on sections of roadway when any of the following conditions exist within the clear zone: A roadside parallel embankment (fill slope) of 3:1 or steeper and a depth of 4 feet or more.

- A water hazard with a depth of 2 feet or more (as measured from the near edge of pavement).
- A ditch section with a depth of 3 feet or more (as measured from the near edge of pavement).
- A fixed object (such as a culvert, pipe, headwall, retaining wall, bridge pier, or abutment).
- Other hazards as determined by the Traffic Engineer.

The clear zone is measured from either the face of curb or the near edge of pavement (on a road with shoulders). For a Class I – IV road with a design speed of 30 miles per hour, the minimum desirable clear zone is 7.5 feet. The width of the clear zone increases as the design speed of the road increases. The width of the clear zone for Class V – IX and for Commercial Industrial Development Roads shall be determined by the Traffic Engineer.

The Traffic Engineer shall make the final determination as to whether guardrail is warranted along a section of roadway based on a review of the plans, a field inspection after rough grading has been completed and/or prior to final acceptance. To avoid untimely adjustments to roadway features to facilitate guardrail, it shall be the responsibility of the developer to notify the Traffic Engineer of potential guardrail needs at the earliest possible stage of construction and prior to the installation of guardrail to ensure that the limits of the potential hazards are adequately protected.

Acceptable Types

Except as noted herein, all guardrail materials, types and installation requirements shall be in accordance with the latest edition of the VDOT Road and Bridge Specifications and Standards. Non-standard guardrail will not be permitted in the County right-of-way.

Guardrail shall be the strong post system, standard GR-2. Although VDOT Standards offer alternative types of posts and offset blocks, the County shall specify the type of guardrail and posts used, based on aesthetics, future maintenance and the types of existing guardrail in the area. When circumstances dictate that the guardrail blend in with the surrounding environment, as well as other aesthetic considerations, “Corten” or

weathering steel rail and accessories with wood posts and wood offset blocks will be required. The type of new guardrail installed at a given location should normally match the existing guardrail type in the immediate area. Prior to any installation, contact the Department of Public Works for approval of the type of guardrail to be installed.

Guardrail terminal treatments (standard GR-6 or GR-7) are required on both the run-on and run-off ends of guardrail, except on roadways with raised or inverted median strips that physically divide opposing lanes of traffic. At locations where raised or inverted medians exist, a guardrail terminal treatment will only be required on the run-on end of the guardrail installation. The preferred treatment should be the standard GR-6 with the end buried into a cut slope, even if the guardrail must be extended a short distance to tie into a cut slope. If this installation is not practical, the standard GR-7 Breakaway Cable Terminal must be used.

The minimum offsets from the edge of pavement or face of curb to the face of the guardrail are shown in the following table. Additional information is shown on the typical road section details in Appendix B.

Guardrail Offsets

Road Classification		Minimum Offset (In Feet) from Edge of Pavement or Face of Curb to Face of Rail
Class I – IV	Shoulders	4.0
	Curb & Gutter without Sidewalk	4.0
	Curb & Gutter with Sidewalk	6.5
Class V – IX	Shoulders	6.0
	Curb & Gutter without Sidewalk	6.5
	Curb & Gutter with Sidewalk	6.5*

* Or Face of Rail same as back of sidewalk if more than 6.5 feet

In order to obtain the above offsets and the 4-foot splays required for standard GR-7, it may be necessary to widen road sections and other engineering features. In addition, it may be necessary to dedicate additional right-of-way or dedicate permanent guardrail easements to encompass all of the guardrail installation, if sufficient right-of-way does not exist for the placement and maintenance of the facility.

2-29 Alleys

The use of public alleys as a part of developments or subdivisions shall be minimized as much as possible. The construction of public alleys will be discouraged in all cases and

will be approved only when a practical alternative, as determined by the Director of Public Works, is not available for the proposed construction.

The design of any alleys shall be stipulated by the Director of Public Works at the time of the approval for the use of the alley. Alleys shall not be constructed with the intent of meeting minimum standards for public roads. As a result, the County shall not maintain any alley. The individual interested in improving the alley or adjacent property owner must enter into a Maintenance Agreement that is acceptable to the Director of Public Works and the County Attorney for the improved portions of the alley.

Improvements (clearing, grading, and/or paving) to existing alleys or alley easements may be completed by an adjacent property owner or interested party. Such improvements must be approved and authorized by the Director of Public Works.

Authorization will not be issued to allow improvements to take place on an existing alley without written concurrence supporting the specific improvements from all adjacent property owners.

2-30 Bikeways and Bike Paths

Bikeways and bike paths are not required to be provided as a part of County road construction.

Road cross-sections do not include provisions for bikeways or bike paths. Bikeways and bike paths should not be placed on or directly adjacent to the road section.

The construction of bikeways and bike paths may be considered for approval, however; they must be physically separated from the road travel lanes and road shoulders. The bikeways and bike paths must be designed in such a manner that the cyclists are encouraged to cross roads at established intersections (or other locations acceptable to the Traffic Engineer) where bikeways intersect public roads.

The County will not maintain bikeways or bike paths. The developer must enter into a Maintenance Agreement acceptable to the Director of Public Works and the County Attorney if bikeways or bike paths are placed on the right-of-way.

All signing of and for the bikeway or bike path shall be in accordance with the MUTCD.

2-31 Street Lighting

Street lighting is not required to be provided on County public roads except as a part of the installation of a new traffic signal. See the Traffic Signal Section of this Manual for

additional information.

On existing roadways, street lighting is installed by the County upon request within some existing sanitary districts. Street light installation requests within sanitary districts should be directed to and coordinated with the Department of Public Utilities.

A permit must be obtained from the Department of Public Works for any proposed lighting which will be on or overhanging the right-of-way prior to the installation of the lighting. The lighting shall be designed in a manner that is acceptable to the Director of Public Works and be compatible with the surrounding environment and intended use. Any street lighting, poles or fixtures which create a hazard to pedestrian or motor vehicle traffic using the right-of-way will not be permitted. Street lighting shall only be installed in accordance with an approved permit.

Applications for street lighting permits shall include plans and/or a sketch indicating the exact location of poles with reference to the right-of-way and the edge of pavement, spacing of poles, width of right-of-way, width of pavement, all photometric data, location of electric service, existing facilities (drainage structures, utilities, etc.) in the right-of-way and any other pertinent data.

The permit applicant should provide a written acknowledgement from the adjacent property owners that indicates they have no objection or are in favor of the street lighting proposal as a part of the application information provided.

Street lighting will be considered as a part of the development of new neighborhoods or subdivisions. A comprehensive plan for the entire area or subdivision shall be developed and submitted as a part of the development plans for review by both the Department of Public Works and the Planning Office. Any proposed street lighting shall be included with the road construction plan package for approval consideration. Landscaping plan approval does not constitute approval of the placement of street lighting on the right-of-way.

Street lighting will only be considered for approval if all costs associated with the street lighting, including energy costs, are not borne by the County. A Maintenance Agreement acceptable to the Director of Public Works and the County Attorney for the street lighting will be required prior to the approval of the street lighting plan.

Street lighting that is proposed along the outside of a roadway shall be placed either behind the curb and gutter and sidewalk shelf area or behind the roadway shoulder and roadside ditch. Street lighting that is proposed to be placed in a roadway median or island will be reviewed and considered on a case by case basis considering the type of lighting proposed and its location, the median or island dimensions, traffic safety and lighting needs.

Installation of the street lighting shall be in conformance with the approved plans, the National Electrical Code, and all other applicable standards.

2-32 Speed Bumps/Speed Humps

The installation of bumps in a public road to attempt to control vehicle speeds, the volume of vehicles using the road, drainage or for any other purpose shall not be permitted.

The installation of speed humps may only be installed as a part of a traffic calming measure implemented in conjunction with an approved traffic calming program for a specific street or streets. All installations must follow the established guidelines of the traffic calming program and must be approved by the Department of Public Works.

2-33 Railroad Crossings

Full grade crossing protection including short-arm gates with flashing signals shall be provided at all new highway-railroad grade crossings. Design of the grade crossing protection shall be in accordance with Federal Highway Administration specifications. The latest edition of the manual titled Railroad Highway Grade Crossing Handbook provides details concerning grade crossing protection requirements.

A crossing, comprised of rubber decking or better quality material, shall be provided and installed in conformance with the standards and requirements of the specific railroad and the Department of Public Works.

The cost of the installation of the grade crossing and grade crossing protection, including maintenance of rail traffic and vehicular traffic during the construction, shall be borne by the developer. The cost of future maintenance of the grade crossing and grade crossing protection shall be borne by the County and the railroad as specified in the Maintenance Agreement between the County and the railroad.

2-34 Pavement Markings

Longitudinal and transverse pavement markings will be installed by the Department of Public Works on County public roads unless otherwise specified at the time of the approval of the road construction plans.

The removal of any existing longitudinal and transverse pavement markings will also be by the Department of Public Works on County public roads unless otherwise specified at the time of the approval of the road construction plans.

The method of pavement marking removal and/or installation, including type of pavement marking material used, will be determined by the Traffic Engineer.

All pavement markings shall be in accordance with the MUTCD.

2-35 Parking on the Public Right-of-Way

The availability of on street parking shall not be considered or counted as a part of meeting the minimum parking space requirements of any development. Parking may be permitted to take place on the right-of-way. Such on street parking shall be in accordance with Chapter 22, Article IV of the Henrico County Code.

Parking may be removed from the right-of-way at any time, by the Traffic Engineer, if it is determined that such parking is creating a traffic safety problem, is impeding normal traffic flow or if the area being used for parking is needed for another purpose.

2-36 Private Access Design at the Intersection of a Public Road

The connection of a private driveway or road to a public road must provide a safe and efficient intersection for motorists and must comply with applicable standards. Numerous factors affect the standards which are applicable to a specific driveway. Some of these factors include:

- The type and size of development the access serves
- The location of the access with respect to other public roads and private access points
- Existing topographic, physical conditions and sight distance
- Geometrics of the adjacent public road
- Number, type and location of other access points serving the development

As a result, each proposed driveway shall be evaluated individually to determine the exact requirements of the specific driveway.

The following criteria shall be used as a general guide for private access design at the intersection of a County public road.

Nonresidential and Multi-family Dwelling Access

The access point location should be as far as possible from a public road intersection. All access points will be reviewed on a case-by-case basis to determine the exact location of the access point.

All access points should intersect with the public road at 90 degrees.

No access point should be located closer than 50 feet from the point of radius of a public road intersection (as measured between the point of radius and the near edge of pavement).

A minimum separation of 30 feet shall be provided between adjacent access points (as measured between the near edge of pavement of the driveway access points). No access point should be located within 12.5 feet of a property line (as measured between the property line and the near edge of pavement of the driveway).

On undivided roadways, the centerline of an access point should align with the centerline of a driveway or road located across the street if the driveways are planned to be within 150 feet of one another (centerline to centerline).

Access points intended for two way traffic flow should have a minimum width of 24 feet and a maximum width of 40 feet. A wider driveway may be required if additional width is needed to provide proper lane alignment, a raised median is provided to separate opposing traffic flows or if additional lanes are needed to satisfy recommendations of the Traffic Engineer.

A median may be permitted to separate opposing traffic flows on two-way access points. The design of the median should be such that the motorist interprets the access point as two (2), one-way driveways and not two (2), two-way driveways. Medians which are provided should have a minimum width of 4 feet and a maximum width of 16 feet.

Access points intended for one-way traffic flow should have a minimum width of 18 feet and a maximum width of 22 feet.

A minimum radius of 15 feet shall be provided at the intersection of the access point and the roadway. Larger radii may be permitted depending on the use, design and location of the driveway. The radius that is utilized should be one that is designed to accommodate the types of vehicles that are anticipated to use the access. The maximum radius that will be permitted is 35 feet.

Adequate sight distance, as specified in Section 2-14 of this Manual, shall be provided at all access points.

Left turn and/or right turn lanes on the public road at the access point may be required. Refer to Section 2-20 of this Manual for additional information.

All access points must be constructed so as to not impair drainage flow in the right-of-way.

Access to parcels that are considered out parcels to other developments (such as shopping centers, office complexes, etc.) shall be internal to the overall development. Separate and/or exclusive access points will not be provided for the out parcels.

Right in/right out "T-bone" directional islands shall not be permitted on driveway access points located on undivided roadways.

Single Family Dwelling Driveways

The width of the access point at the right-of-way line shall be 12 feet minimum. Wider access points will be considered on a case-by-case basis considering need, physical conditions of the area and safety.

No access point shall be permitted to be placed within the radius of a public road intersection.

All access points should intersect with the public road at 90 degrees.

All access points must be constructed so as to not impair drainage flow in the right of way.

Access design at the intersection of a roadway maintained by VDOT should be based on criteria provided by VDOT [Minimum Standards of Entrances to State Highways Manual](#).

2-37 Traffic Signals

The developers shall pay for the design and installation of any new traffic signals or modification to an existing traffic signal, if warranted by their development. If no traffic signal exists, but one is anticipated at the subdivision street in the future, the developer will be required to install all underground infrastructure (i.e. junction boxes and conduit), as determined by the Traffic Engineer, at the time of construction of the new subdivision street.

The installation of street lighting on the traffic signal mast arm poles, as determined by the Traffic Engineer, is considered a part of the traffic signal installation.

Street name signs will be installed by Henrico County in a new subdivision after either of the following criteria is met:

- The developer has paid for the street name signs and the roads have formally been accepted into the County road system by the Board of Supervisors or;
- The developer has paid for the street name signs and the developer provides the Department of Public Works with a letter indicating that he will bear the cost of any maintenance which is needed to the street name signs until such time the roads in the subdivision have formally been accepted into the County road system by the Board of Supervisors.

2-39 Traffic Control Signs

Prior to acceptance of the roads, the developer shall be responsible for providing and maintaining all necessary traffic control signs within the subdivision.

The developer shall coordinate the installation of any traffic control signs that are installed on future public roads with the Traffic Engineer to insure correct and proper signing will be used in terms of sign type, location and sign size, shape and color.

All traffic control signs within the subdivision shall be installed by the Department of Public Works after the roads have been formally accepted into the County road system by the Board of Supervisors.

2-40 Road Extension Sign

Signs indicating that a stub roadway, within a subdivision, will be extended in the future shall be installed at the end of stub roads as a part of the subdivision development. The sign shall have a message that indicates the following:

“This Road is to be Extended with Future Development. For More Information Contact the County of Henrico Planning Office at 501-4602”.

A detail for the design of the road extension sign is identified in Appendix C. The sign is to be provided by the developer and fabricated using a 0.080-inch gauge aluminum sign blank and fully reflective (minimum engineering grade material) sheeting.

An alternate sign message may be utilized if it is determined by the Traffic Engineer that the alternate message conveys a clear indication that the road will be extended in the future.

The cost of all road extension signs shall be bonded by the developer, as a part of the subdivision performance bond. Road extension signs shall be installed prior to the issuance of the first building permit in the subdivision.

The developer shall bear the cost of any maintenance which is needed to the road extension signs until such time the roads in the subdivision have formally been accepted into County road system by the Board of Supervisors.

2-41 End of Road Barricade

A wooden barricade shall be provided at the end of all stub streets that have a length greater than the depth of one lot, unless otherwise determined by the Traffic Engineer. The barricade shall conform to the standards shown in Appendix C. If access to the adjacent property is needed from the end of the stub street, an alternative design may be approved by the Traffic Engineer.

2-42 Unmaintained Road Sign

When collector and arterial roadways are constructed as a part of a subdivision or other development by a private developer, it sometimes becomes necessary to permit public traffic to use the road prior to the acceptance of the road into the County road system. In such instances, or when determined by the Traffic Engineer, signs with the following message shall be installed.

“This Roadway Not Maintained by the County”

The above sign shall be installed at the locations noted on the plan.

A detail for the design of the unmaintained road sign is identified in Appendix C. The sign is to be provided by the developer and fabricated using a 0.080 inch gauge aluminum sign blank and fully reflective (minimum engineering grade material) sheeting.

The cost of all unmaintained road signs shall be bonded by the developer, as a part of the subdivision performance bond.

The developer shall bear the cost of any maintenance that is needed to the unmaintained road signs until such time the road has formally been accepted into the County road system by the Board of Supervisors.

The Director of Public Works must approve any street lighting at the subdivision entrance, or along the roadways in the subdivision.

2-38 Street Name Signs

Roads within the Public Rights-of-Way

Street name signs for all roads located within public rights-of-way shall be fabricated using #086054 extruded aluminum with a width of 9 inches. The signs shall be fully reflective, double faced and covered with prismatic lens sheeting (3M Brand VIP or approved equivalent). The signs shall display a green background with white upper and lower case C-stroke letters. The name of the street shall consist of 5-inch upper case letters and 3 ¾ lower case letters. The suffix shall be 2 ½ inch upper case letters.

Street name signs located within public right-of-way should be installed on a 4-inch by 4 inch by 12-foot pressure treated wood post. The street name blades should be attached to the post in a cantilever fashion using aluminum brackets. The minimum mounting height of the street name signs shall be 7 ½ feet as measured from the surrounding finished grade to the bottom of the lowest blade.

The cost of all street name signs shall be bonded by the developer, as a part of the subdivision performance bond, and all street name signs for roads located within public rights-of-way shall be installed by Henrico County, unless otherwise approved by the Traffic Engineer.

Private Roads

The same standards for the fabrication and installation listed above for street name signs for roads located within public rights-of-way apply to street name signs for private roads with the exception of color. The signs for private roads shall display a white background with black letters.

Street name signs for private roads shall have a width of 9 inches unless it is to be installed at the intersection of two private roads (internal to the development), in which case the signs may have a width of 6 inches. When a 6-inch sign is used, the name of the street shall consist of 4-inch upper case letters and 3-inch lower case letters. The suffix shall be 2-inch upper case letters.

The developer may install street name signs for private roads.

Installation of Signs in New Subdivisions