GENERAL

1. Description

This standard identifies minimum requirements that shall be met for all Vertical Speed Control Devices in the design and construction of elements for Arlington County Horizontal Design Standards. The development of this standard is to provide greater guidance in the design and construction of vertical speed control devices while meeting the County’s guiding principles for increasing pedestrian safety and accessibility, decreasing county infrastructure costs and balancing the use of the Right-of-Way between all modes of transportation.

2. Related Arlington County Standards

A. Arlington County Construction Standards and Specifications
B. Arlington County Neighborhood Traffic Calming Manual
C. Arlington County Horizontal Standards H-3.1 Driveway Entrances
D. Arlington County Horizontal Standards H-3.2 Curb Ramps
E. Arlington County Horizontal Standards H-3.3 Curb Extensions
F. Arlington County Horizontal Standards H-3.7 Crosswalks

3. Applicable Standards and Specifications

A. Manual of Uniform Traffic Control Devices (MUTCD)
B. Code of Virginia
C. Americans with Disabilities Act - Accessibility Guidelines for Building and Facilities (ADAAG)
D. American with Disabilities Accessibility Guidelines for Public Rights-of-Way (PROWAG)

4. Quality Assurance

A. Reserved

5. Submittals

A. Vertical speed control devices used in traffic calming shall be placed consistent with the Neighborhood Traffic Calming (NTC) manual. All other uses shall be approved by the DES Transportation Engineering and Operations (TE&O) Bureau Chief.
DESIGN CONSIDERATIONS

A. Definition

Vertical Speed Control is a raised device used to reduce vehicle speed on streets. These devices can be in the following forms:

1. Speed Tables
   Speed tables are generally placed mid block in a series of several devices on neighborhood minor streets. Speed tables shall not be used on primary emergency response route.

2. Speed Cushions
   Speed cushions are generally placed mid block in a series of several devices on neighborhood minor streets designated as a primary emergency response route.

3. Raised Crosswalk
   Raised crosswalks are generally placed on neighborhood minor streets or segregated right turn lanes. They are generally placed at intersection or mid block locations. Raised crosswalks shall not be used on primary emergency response route.

4. Raised Intersections
   Raised intersections are generally placed at the intersections of two neighborhood minor streets. Marked crosswalks shall be included within the limits of the raised intersection. Raised intersections shall not be used on primary emergency response route.

B. Purpose

1. The primary purpose of a vertical speed control device is to reduce vehicle speed on streets.

DESIGN

A. Dimensions

1. Speed Table
   a. A speed table is a short, raised street section that extends across the roadway. Speed tables are gradual changes in the roadway surface 22 feet long and 3.5 inches high and placed a minimum of 100’ from an intersection. Speed tables are most effective if used in a series; spaced 300 to 500 feet apart. Speed tables shall be installed with the appropriate signage. Speed tables may be used as traffic calming devices consistent with the NTC manual or as designated by the TE&O Bureau Chief.
2. Speed Cushions
   a. A speed cushion is a short, raised street section that extends across the roadway. They are 22 feet long and 3.5 inches high and placed a minimum of 100’ from an intersection. There are three sections to the speed cushion, which allows emergency vehicles to drive through the center section without affecting response time or jolting patients in an ambulance. Speed cushions are most effective if used in a series; spaced 300 to 500 feet apart. A marked centerline shall be installed along with speed cushions as well as the appropriate signage. Speed cushions may be used as traffic calming devices consistent with the NTC manual or as designated by the TE&O Bureau Chief.

3. Raised Crosswalks
   Raised crosswalks are marked crosswalks (refer to Arlington County Horizontal Standards H-3.7 Crosswalks) placed on a modified speed table. Raised crosswalks identify the preferred path for pedestrians and bicyclist to cross the roadway where there may be potential conflict. Raised crosswalks may be placed at intersections or mid block locations and may be used as traffic calming devices consistent with the NTC manual or as designated by the TE&O Bureau Chief.
   
   a. Mid Block
      i. Typically 6” in height with a 32’length measured along the street center line. Refer to detail VSC-3.0.
      ii. The marked crosswalk shall comply with the Arlington County Horizontal Standards H-3.7 Crosswalks standard. The full width of the crosswalk shall be included within the flat portion of the speed table.
      iii. Design shall ensure that positive drainage be provided across the crosswalk and at all adjacent curbs.
      iv. It is preferred that a catch basin be located directly upstream of the raised crosswalk.
      v. Alternate drainage may be provide by the designer if catch basins can’t be located directly upstream of the raised crosswalk in the form of a diversion channel supporting ADA compliant heel proof grates. refer to VSC- 3.0
      vi. When the designer is faced with conflicts involving; emergency response routes, significant bus routes, utilities, driveways or drainage, the height of the crosswalk may be modified.
      vii. Modified raised mid block crosswalks
         1) Typically 3.5” in height with a 22’length measured along the street center line. Refer to detail VSC-4.0.
         2) The marked crosswalk shall comply with the Arlington County Horizontal Standards H-3.7 Crosswalks standard. The full width of the crosswalk shall be included within the flat portion of the speed table.
         3) ADA compliant ramps shall be provided
         4) It is preferred that a catch basin be located directly upstream of the modified raised crosswalk.
5) A diversion channel supporting ADA compliant heel proof grates may be needed when curb extensions are used with the modified raised crosswalk.

b. Intersection
i. Typically 3.5” in height with a 22’length measured along the street center line. Refer to detail VSC-5.0.
ii. The marked crosswalk shall comply with the Arlington County Horizontal Standards H-3.7 Crosswalks standard. The full width of the crosswalk shall be included within the flat portion of the speed table.
iii. ADA compliant ramps shall be provided
iv. Design shall ensure that positive drainage be provided across the crosswalk and at all adjacent curbs.
v. Catch basins shall be located directly upstream of the raised crosswalk. A diversion channel shall not be used as a means of addressing drainage issues.
vi. Where placement of a crosswalk in combination with road geometry permits, a 6” high modified crosswalk may be used.
vii. Modified raised crosswalks at intersections
   1) Typically 6” in height with a 32’length measured along the street center line. Refer to detail VSC-6.0.
   2) When the road geometry does not allow for a full 6” height crosswalk at a T-intersection and low traffic volumes exist, a combination driveway apron raised crosswalk may be used. Refer to detail VSC_7.0
   3) The marked crosswalk shall comply with the Arlington County Horizontal Standards H-3.7 Crosswalks standard. The full width of the crosswalk shall be included within the flat portion of the speed table.

4. Raised Intersections
a. Raised intersections are elevated areas covering the entire intersection. Their preferred height is 6” above street height and flush with the adjacent curbs. Where a height of 6” cannot be achieved a minimum height of 3.5” above street level may be considered. In all cases positive drainage must be maintained across the entire intersection. Pedestrian access routes through the raised intersection shall be ADA compliant.

B. Materials

1. Vertical speed control devices shall be constructed of materials that match the street type and shall be designated with County standard markings in a retro reflective material. Asphalt is the preferred material but in some cases concrete on asphalt may be required. Decorative treatment and alternate materials may be approved.
H-3.8

VERTICAL SPEED CONTROL DEVICES

DETAILS

SPEED TABLE PROFILE

Approach Ramp

6.0’

10.0’

6.0’

3.5”

Standard County Curb & Gutter

12.0” Taper

Mill and remove pavement min 2” prior to installing speed table

APPROACH RAMP PROFILE

TYPICAL SPEED TABLE DIMENSIONS

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ARLINGTON COUNTY, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

DRAWING NO. VSC-1.0
SHEET 1 OF 1
ADA required
Dectable Warning

Standard County C-3 Header Curb

Standard County Curb & Gutter

Channel width shall be sized to accommodate design flow

min 11.0'

min 11.0'

min 10.0'

Standard County Catch Basin located upstream

Diversion Channel located upstream when Catch basin can not be installed

Standard County C-3 Header Curb

ADA Compliant Heelproof Grate installed over diversion channel

Note: Refer to Arlington County Horizontal Standards H-3.3 Curb Extensions and H-3.7 Crosswalks for further requirements

TYPICAL 6" RAISED MIDBLOCK CROSSWALK with CURB EXTENSIONS
H-3.8

VERTICAL SPEED CONTROL DEVICES

TYPICAL RAISED CROSSWALK PROFILE

- Width of Marked Crosswalk min 10.0'
- Approach Ramp 11.0'
- Mill and remove pavement min 2" prior to installing raised crosswalk

TYPICAL RAISED CROSSWALK CROSS-SECTION A-A

- Standard County C-3 Header Curb
- Standard County Sidewalk
- AOA Compliant Heelproof Grate

TYPICAL 6" RAISED MIDBLOCK CROSSWALK

Approach Ramp Profile

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ARLINGTON COUNTY, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

DRAWING NO. VSC-3.0
Sheet 2 of 3
Standard County Curb & Gutter

Channel width shall be sized to accommodate design flow

Standard County C-3 Header Curb

ADA required Detectable Warning

Standard County Catch Basin located upstream

Diversion Channel located upstream when Catch basin can not be installed

ADA Compliant Heelproof Grate installed over diversion channel

Note: Refer to Arlington County Horizontal Standards H-3.3 Curb Extensions and H-3.7 Crosswalks for further requirements

TYPICAL 6" RAISED MIDBLOCK CROSSWALK without CURB EXTENSIONS
H-3.8 VERTICAL SPEED CONTROL DEVICES

MODIFIED 3.5" RAISED MIDBLOCK CROSSWALK with CURB EXTENSIONS

ARLINGTON COUNTY, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

Note: Refer to Arlington County Horizontal Standards H-3.3 Curb Extensions and H-3.7 Crosswalks for further requirements.
MODIFIED 3.5" RAISED MIDBLOCK CROSSWALK

ARLINGTON COUNTY, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

DRAWING NO.
VSC-4.0
Sheet 2 of 3
Note: Refer to Arlington County Horizontal Standards H-3.3 Curb Extensions and H-3.7 Crosswalks for further requirements.
TYPICAL 3.5" RAISED INTERSECTION CROSSWALK

ARLINGTON COUNTY, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

DRAWING NO. VSC-5.0
Sheet 1 of 1
H-3.8   VERTICAL SPEED CONTROL DEVICES

Note: Refer to VSC-3.0 for profile and cross section

Standard County Curb & Gutter

Standard County Catch Basin located upstream

min 11.0'

min 10.0'

min 11.0'

Standard County C-3 Header Curb

Standard County Catch Basin located upstream

Note: Refer to Arlington County Horizontal Standards H-3.3 Curb Extensions and H-3.7 Crosswalks for further requirements

MODIFIED 6" RAISED INTERSECTION CROSSWALK

ARLINGTON COUNTY, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

REVISION & DATE

DRAWING NO.
VSC-6.0
Sheet 1 of 1
Note: Refer to Arlington County Horizontal Standards H-3.1 Driveway Entrances, H-3.3 Curb Extensions and H-3.7 Crosswalks for further requirements.