SECTION 32 17 19

ASPHALT CONCRETE TRAFFIC CALMING DEVICES

PART 1 – GENERAL

1.1 DESCRIPTION

A. This Section includes provisions for constructing new or replacement asphalt concrete vertical deflection traffic calming devices, necessitated by pavement restoration or utility projects. Vertical deflection traffic calming devices include speed humps, speed cushions, speed tables and raised crosswalks. These devices are to be constructed at the locations and to the dimensions and details shown on the Drawings, in accordance with the Project Manual and as directed by the City.

1.2 RELATED SECTIONS

A. 01 55 26 Traffic Control

B. 32 12 16 Asphalt Paving

1.3 REFERENCE STANDARDS

A. DPW Standard Specifications (SSDPWSF), revised November 2000.

B. Caltrans Standard Specifications (CTSS), 2010.

C. Caltrans Revised Standard Specifications (CTRSS), March 2017.

D. San Francisco Municipal Transportation Agency (SFMTA) Standard Plans

1. STR-7687 Rev 3, Standard Plan - Speed Hump
2. STR-7687.1 Rev. 0, Standard Plan - Speed Table
3. STR-7687.2 Rev. 0, Standard Plan - Asphalt Raised Crosswalk
4. STR-7687.3 Rev 0, Traffic Striping & Signs - Vertical Deflection Devices
5. STR-7932 Rev 0, Construction Specs - Typical Speed Cushion Streets 37ft to 50ft Wide

1.4 DEFINITIONS

A. Speed Hump: Speed humps are 12 feet long measured in the direction of traffic flow and have a height of 3.25 - 3.75 inches at their highest point. Speed humps are the most effective traffic calming device in reducing vehicular speeds on a residential street. Refer to drawing STR-7687 Rev 3 Standard Plan Speed Hump for details.

B. Speed Cushion: Speed cushions are speed humps that include wheel cutouts to allow large vehicles, such as Muni buses and emergency response vehicles, to pass unaffected while reducing passenger vehicle speeds. Refer to drawing STR-7932 Rev 0 Construction Specs Typical Speed Cushion Streets 37ft to 50ft Wide for details.

C. Speed Table: Speed tables are midblock traffic calming devices that raise the wheelbase of a vehicle to reduce its traffic speed. Speed tables, which have the same profile as raised crosswalks, are longer than speed humps and flat-topped, with a height of 3.25 – 3.75 inches and a length of 22 feet in the direction of traffic flow, comprised of two 6-foot long ramps on either side and a 10-foot long plateau (or 'table'). Refer to drawing STR-7687.1 Rev. 0 – Standard Plan Speed Table for details.

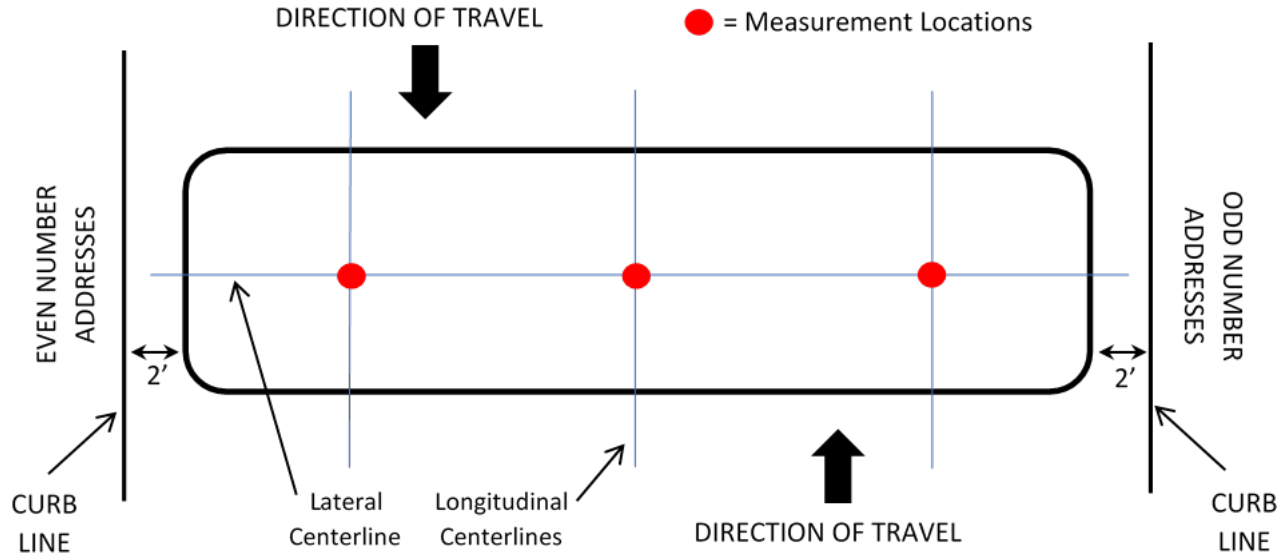
D. Raised Crosswalk: Raised crosswalks are speed tables with crosswalk markings and signs that channelize pedestrian crossings and provide pedestrians with a level street crossing. Raised crosswalks are longer than speed humps and flat-topped, with a height of 3.25 – 3.75 inches and a minimum length of 22 feet in the direction of traffic flow, comprised of two 6-foot long ramps on either side of a minimum 10-foot long plateau. Designs include a channel that is 2 – 4 feet from the curb ramp and a 4-foot ramp up/down on each side to facilitate pedestrian access. Refer to drawing STR-7987.2 Rev. 0 – Standard Plan Asphalt Raised Crosswalk for details.

1.5 PERFORMANCE QUALITY CONTROL

A. Contractor shall measure height of every asphalt traffic calming device post-construction to verify that the device meets specifications, and submit those measurements to the City Representative.

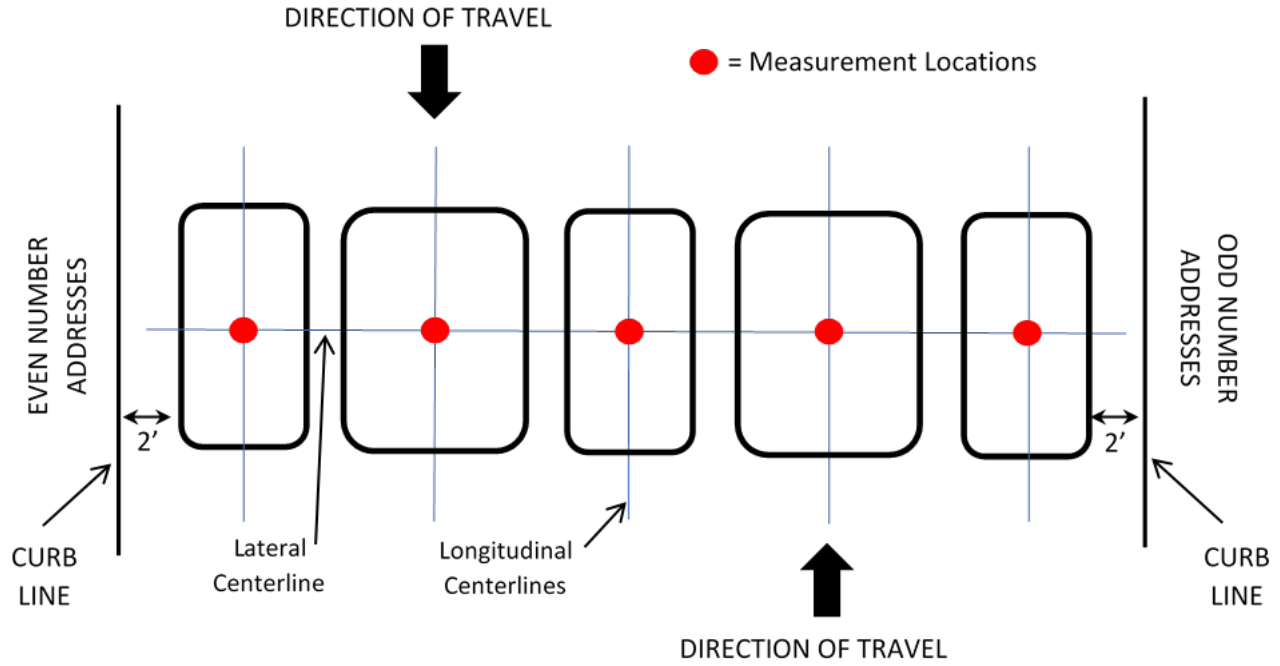
1. Speed humps, speed tables and raised crosswalks – three (3) height measurements must be recorded. Divide the device into three equal sections and measure the height at the points where the lateral centerline of each section intersects the longitudinal centerline described in Figure 1.

Figure 1. QC Measurements for Speed Humps, Speed Tables and Raised Crosswalks



2. Speed cushions – there are two primary types of speed cushions, 3-hump and 5-hump, therefore either three (3) or five (5) height measurements must be recorded depending on the type. Measure the height at the points where the lateral centerline of each hump intersects the longitudinal centerline described in Figure 2.

Figure 2. QC Measurements for Speed Cushions (3-hump or 5-hump)



B. If a device, or any portion thereof, is measured and does not meet specifications, Contractor must immediately correct it and re-measure prior to providing final

measurements to the City Representative.

1.6 SUBMITTALS

A. Prior to starting construction, the Contractor shall submit the asphalt concrete mix design, including the amount of asphalt binder to be mixed with the dry aggregate to the City Representative for approval. No work will be allowed prior to the approval of the mix design. Asphalt concrete mix design will conform to Section 39 of the 2010 Caltrans Standard Specifications and as modified below under Article "Materials".

B. The Contractor shall submit (8) copies of the manufacturer's literature, Specifications, applications and installations for filler and/or sealer material to the City Representative for approval at least five (5) calendar days in advance of performing the filling and/or sealing work.

1.7 PRE-CONSTRUCTION MEETING

A. The Contractor shall notify the SFMTA Traffic Calming Program at TrafficCalmingProgram@sfmta.com and the Traffic Engineer through the City Representative of the proposed schedule for removing and constructing any traffic calming devices.

1. Notify SFMTA at least five (5) calendar days in advance of removing a traffic calming device, and to schedule a field visit to layout new traffic calming devices.

2. Notify SFMTA when final pavement is restored and provide a schedule for construction of the new or replacement traffic calming devices (within 2 weeks of completing asphalt concrete wearing surface).

B. Prior to removing existing traffic calming devices, Contractor shall mark location for replacement at same location, preferably with survey nail and washer on the curb so marks remain visible after any trenching or paving work.

C. If non-standard speed bumps or rumble strips are to be removed and new traffic calming devices are to be constructed, SFMTA Livable streets will locate the new devices with the Contractor in the field.

PART 2 – PRODUCTS

2.1 MATERIALS

A. The Contractor is encouraged to use Reclaimed Asphalt Pavement (RAP) in accordance with the 2010 Caltrans Standard Specifications and Revised Standard

Specifications. Specifically, refer to 2010 CTRSS Section 39-2.02E outlining current maximum RAP substitution rate. Minimum RAP substitution rate shall be 15% of the aggregate blend.

B. Asphalt: In accordance with the requirements of CTSS Section 39–1.02C of the 2010 Caltrans Standard Specifications, except that asphalt will be either PG 64–10 or AR–4000.

C. Aggregate: In accordance with the requirements of CTRSS Section 39–2.02D of the 2010 Caltrans Revised Standard Specifications, except that aggregate grading will be as follows:

Sieve Sizes	Limits of Proposed	Operating Range	Contract Compliance
3/4"	–	100	100
1/2"	–	95–100	89–100
3/8"		80–95	75–100
No. 4	59–66	X±5	X±8
No. 8	43–49	X±5	X±8
No. 30	22–27	X±5	X±8
No. 200	–	3–8	0–11

Minimum Durability Index: When tested in accordance with AASHTO T 210 shall be 50.

D. Paint Binder: In accordance with the requirements of Section 212.06 of the DPW Standard Specifications, except that paint binder shall be emulsified asphalt Type SS-1 or SS-1h.

E. Sealer: It will be a combination of polymeric compounds, cures to a soft, highly flexible, rubber like material that is capable of maintaining a sealed joint or crack over a wide temperature range. Sealer will be cold applied SOF–SEAL, low modulus horizontal sealant, manufactured by:

W.R. Meadows, Inc.
865 Teal Drive
Benicia, CA 94510
Phone (707) 745-6666

or approved equal.

PART 3 – EXECUTION

3.1 EXAMINATION

A. The Contractor shall not proceed with construction of traffic calming devices until payment resurfacing has been inspected and accepted by the City Representative.

B. New or replacement traffic calming devices should be constructed within **two weeks** of completing asphalt concrete wearing surface (**to allow time for rolling straight edge test/paving acceptance)**.

3.2 CONSTRUCTION

A. Mark the area of the traffic calming device.

B. Key the traffic calming device to existing pavement by cutting and milling inside perimeter 2-feet wide by 2-inches deep.

C. Apply paint binder in accordance with the requirements of Section 212.06 of the DPW Standard Specifications.

D. Place and compact hot-mix asphalt to cross section indicated in no more than 2 lifts. Hot tamp hand-placed materials by means of pneumatic tampers or by other methods that will produce the same degree of compaction as pneumatic tampers.

E. Final Compaction shall be equivalent to an 8-ton static roller.

F. Seal edges with approved sealer to prevent moisture penetration.

G. Install temporary pavement markings ('chevrons') on traffic calming device prior to opening to traffic. Refer to drawing STR-7687.3 Rev 0 Traffic Striping & Signs Vertical Deflection Devices for signage and additional pavement markings as required by the Traffic Engineer.

END OF SECTION