

To: Planning Board, Town Planner
From: David Robbins (Planning Board Member)
Subject: Curb Requirements
Date: December 14, 2020

The purpose of this memorandum is to briefly review Grafton's current subdivision rules regarding curbs and compare Grafton's rules with those in other Massachusetts municipalities. This can serve as a basis for understanding our current rules and informing discussion about potential changes to our rules.

Grafton's Rules

Our current rules are found in the *Rules and Regulations Regarding the Subdivision of Land*, as last updated April 27, 2009.

Section 4 (Design Requirements) imposes the following rules for curbs:

4.2.1 Granite Curb

Unless otherwise specified by the Planning Board, granite curbs of the dimensions given for granite curbs (Section M.9.04.1) Type VA4 shall be provided in the following locations:

- 4.2.1.1 Streets in a non-residential subdivision, and all Major Streets: Along each edge of the roadway for the full length of the street.
- 4.2.1.2 All Other Streets
 - a) At intersections along the paving edge the distance of arcs of the curves plus a straight section of eight feet (8') at each end of said arcs.
 - b) Along each edge of the roadway where the grade exceeds two percent (2%)
 - c) Along each edge of the roadway on all curves with a radius of less than two hundred and fifty feet (250').

4.2.2 Bituminous Curb

Except where granite curbing has been required, the edges of a street shall be provided with a bituminous concrete low profile "Cape Cod" berm along both edges of the roadway for the full length of the roadway.

Note that while the regulations do not include the term "vertical" for granite curbs, the type "VA4" refers to a MassHighway designation for vertical granite curbstone; thus, "vertical" is clearly implied. (MassHighway types SA and SB refer to sloped granite.)

Curb Types

Curb materials and shapes vary. In a review of curb requirements in central and eastern Massachusetts (see below), most municipalities recommend or require granite (vertical or sloped) and/or bituminous concrete (of various profiles) curbing.

The MassHighway *Construction Standard Details* (2017) document includes diagrams showing various curb profiles.

Granite curbs are illustrated in Figure 1 (vertical granite) and Figure 2 (sloped granite). Note that MassHighway refers to the former as “vertical curb” and the latter as “sloped edging.”

Bituminous concrete curbs are illustrated in Figure 3 (curbs other than low-profile) and Figure 4 (low profile, known as Type A in MassHighway documents, and frequently referred to as Cape Cod berm). While Figure 4 shows a berm with a slope of 1:12, this style of berm is quite often constructed with a significantly greater slope, and not always 24” wide. MassHighway has in recent years adopted the term “hot mix asphalt” for this material, though it is still very commonly referred to as “bituminous concrete.”

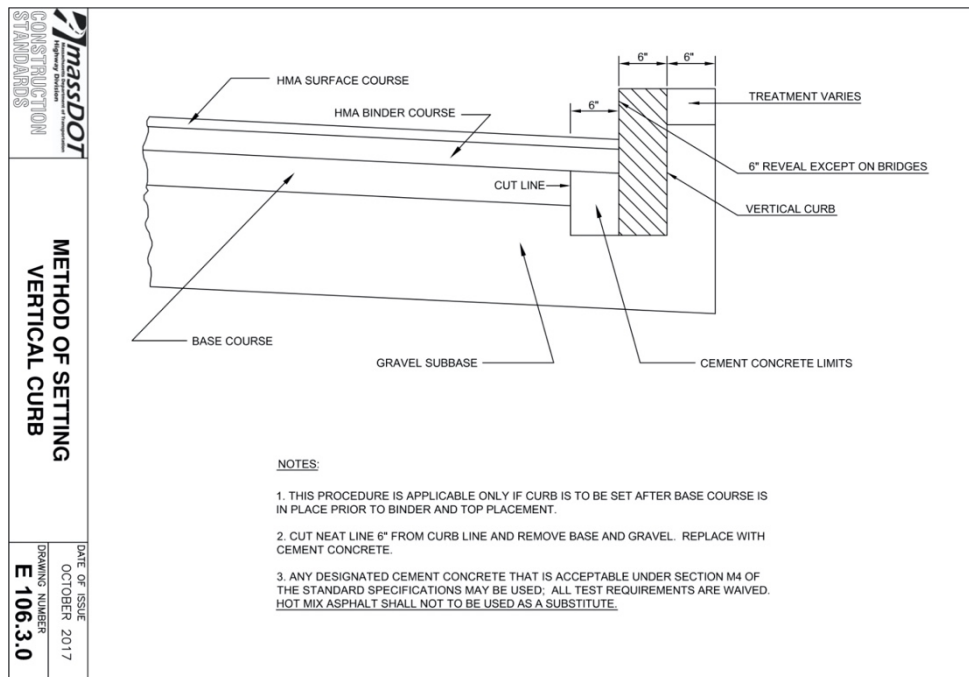


Figure 1

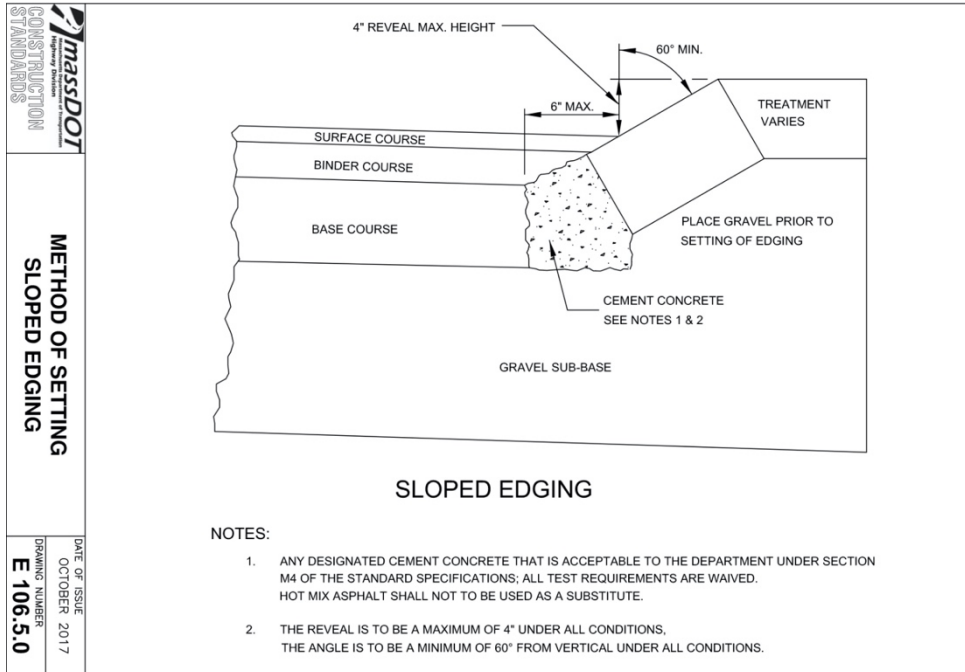


Figure 2

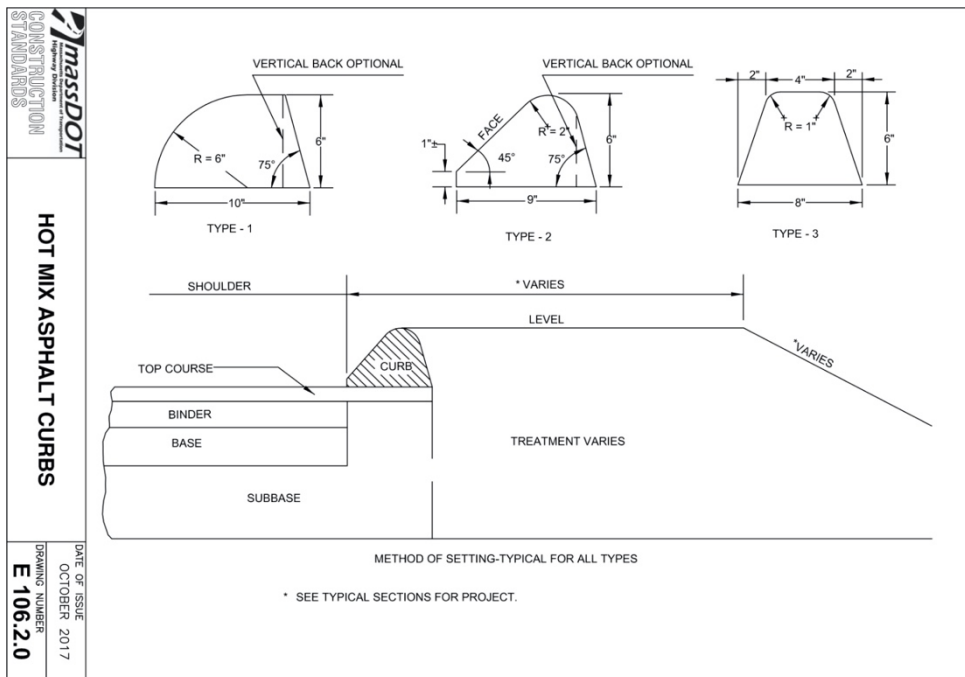


Figure 3

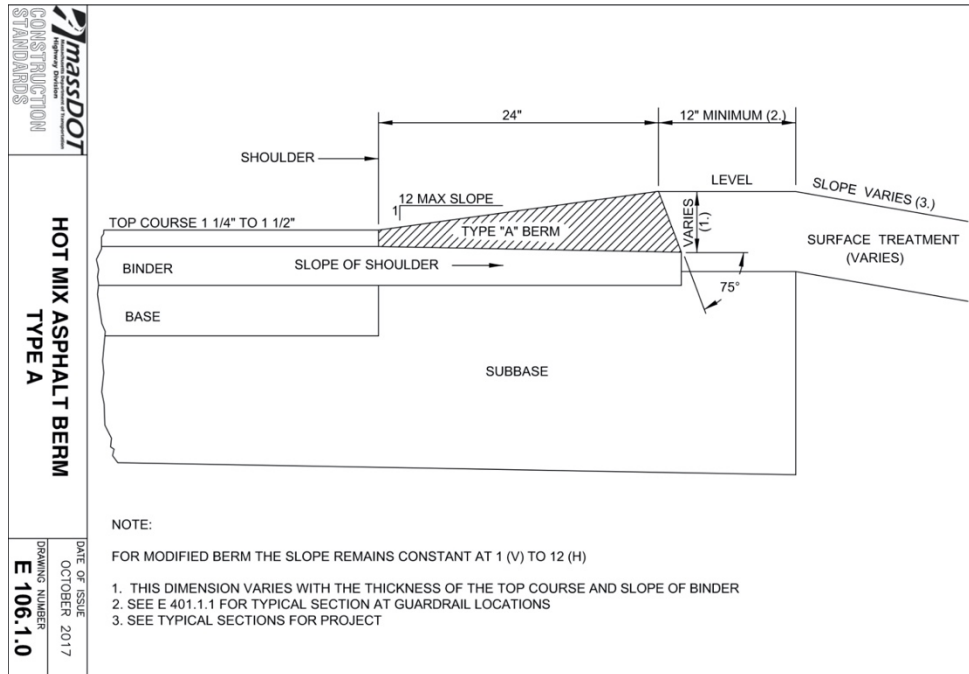


Figure 4

Curb Rules in Other Municipalities

An informative study, *Residential Land-Use Regulation in Eastern Massachusetts*, was published in 2005 by the Pioneer Institute for Public Policy Research and the Rappaport Institute for Greater Boston (<http://www.masshousingregulations.com>). Included in this study was a review of selected topics in subdivision regulations from 187 municipalities in central and eastern Massachusetts (highlighted in Figure 5).

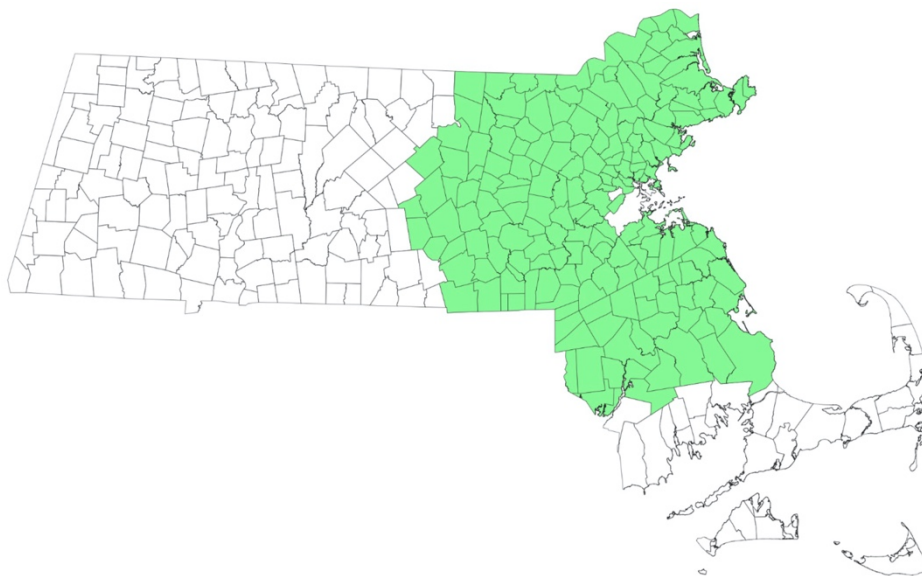


Figure 5 – Municipalities Included in Study

A review of the curb regulations cited in that study shows that Grafton's rules are generally similar to those in other municipalities, though there is substantial variation among municipalities in details of where curbing is required and the curb design and material. (The study's objective for curbs was limited to surveying the type of curb material used, and the regulations quoted did not always include all rules relating to curbs, so the observations here may be incomplete.)

Of the 187 municipalities, the study included curb requirements for 161 municipalities. The remainder either did not have any curb requirements or the study did not include any curb requirements they might have had.

As to where curbs are required, the study found:

- 109 require curbs on all subdivision roads
- 52 did not require curbs on all subdivision roads, though curbs were often required in specific situations (see below)

As to the materials required or accepted for curbs in general, the study found:

- 112 require or allow granite curbs
- 77 require granite curbs exclusively (no other curb material accepted)
- 10 require or allow precast concrete curbs
- 82 require or allow bituminous concrete curbs
- 49 require bituminous concrete curbs exclusively (no other curb material accepted)
- 25 allow both granite and bituminous concrete curbs

Granite curbing is in many cases specified without qualifying the term with the orientation (vertical or sloped). Of the 112 municipalities that specify granite curbs:

- 34 do not specify the orientation
- 42 specify vertical granite
- 21 specify sloped granite
- 15 specify both vertical and sloped granite

Bituminous concrete curbing is sometimes, but not always, specified to be "Cape Cod" or "modified Cape Cod" berm. Of the 82 municipalities that specify bituminous concrete curbs:

- 44 specify the material but not the profile
- 38 specify Cape Cod berm

In many municipalities, one or more of the following situations require curbing where otherwise curbing is not required, or have more stringent curbing requirements:

- 74 have curb requirements for intersection roundings
- 34 have curb requirements for roads whose grade exceeds a threshold
- 25 have curb requirements for curves whose radius is less than a threshold (this applies to curves generally, and is distinct from intersection roundings)

Of the 74 with curb requirements at intersections, the study found:

- 68 require granite curbs
- 41 of the 68 specifically require vertical granite curbs
- 12 of the 68 specifically require sloped granite curbs

- 34 require curbs only on the rounding's arc
- 40 require curbs to extend some distance in a straight line from each end of the arc; of those, the extension distance is 6' in 19 cases and 8' in 17 cases

Of the 34 with curb requirements on grades, the study found:

- 24 require granite curbs
- 18 of the 24 specifically require vertical granite curbs
- The threshold is 2%, 3%, or 4% for 9 of the 34, and 5% or more for 25 of the 34
- The most common thresholds are 5% (14 cases) and 6% (11 cases)

Of the 25 with curb requirements for curves whose radius is less than a threshold, the study found:

- 22 require granite curbs
- 15 of the 22 specifically require vertical granite curbs
- The most common threshold is 250' (10 cases); the next most common is 60' (7 cases)

Purpose of Curbs

In the *MassHighway Project Development & Design Guide*, and a few of the subdivision regulations reviewed for the aforementioned study, there is some discussion of the purpose of curbs. Curbs serve several purposes:

- Define and delineate the edge of pavement, and define points of access such as driveways.
- Control stormwater, channeling drainage and preventing erosion.
- Prevent damage by snow removal and other equipment; granite curbing seems to be preferred for this purpose.
- Confine vehicles to the pavement where necessary for safety reasons; vertical curbing is required for this purpose. A corollary is that sloped curbing or a Cape Cod berm is to be preferred if it is desired to allow vehicles to park at least partially off the pavement or otherwise be able to safely leave the pavement. (Although not generally relevant for subdivision roads, vertical curbs are to be avoided on roads with higher speeds, as it is preferable for vehicles to be able to go off pavement rather than bounce off a vertical curb into traffic.)

Except where noted above, all types of curbing are generally acceptable for the purpose.

Observations

Some possibly significant differences between Grafton's current subdivision regulations and those of other municipalities include:

- Grafton does not include sloped granite in the set of acceptable materials.
- While a majority of municipalities that require curbing at intersection roundings require vertical granite, sloped granite has been required or allowed by over a dozen municipalities.

- Relatively few municipalities require curbs when the grade exceeds a threshold, but of those that do, most set the threshold at 5% or 6%, while Grafton's threshold of 2% is the lowest used by any municipality.