

4.3-b CURB AND GUTTER

DESCRIPTION

Curb and gutters are concrete or asphalt structures used to collect surface runoff from paved streets, parking lots, or other impervious surfaces and convey it to a storm drain system or appropriate treatment and/or infiltration system. A typical curb and gutter system will concentrate runoff volumes, therefore curbs should only be installed when necessary to convey runoff to a suitable infiltration system or area, when such infiltration cannot be accommodated on-site. Hydrologic and pollutant source control BMPs shall be incorporated along with curb and gutter design and installation. Curb cuts should be incorporated into curb and gutter systems to break up concentrated runoff and discharge it to a surface infiltration and/or treatment system, such as a vegetated swale, rain garden, or tree planter box. Wherever possible, eliminate or minimize curb and gutter systems.

Curb and gutter alone have no water quality benefit and tend to increase directly connected impervious areas, creating higher runoff volumes and pollutant loading at discharge locations. However, in a developed watershed, they are often a necessary component of a drainage and treatment system that as a whole improves water quality.



This curb cut breaks up concentrated stormwater and discharges to a vegetated depression.

BMP DESIGN APPROACH

- Pollutant Source Control
- Hydrologic Source Control
- Stormwater Treatment

SCALE OF APPLICATION

All SFR and MFR < 1 acre

MFR 1-5 Acre and CICU < 5 acres

MFR and CICU > 5 acres and all WQIPs

TYPE OF APPLICATION

Temporary

Permanent

APPLICABILITY

- Curb and gutters are suitable for the collection and conveyance of runoff from paved surfaces.
- Runoff from impervious surfaces can be treated and infiltrated adjacent to roadways by implementing curb cuts into the curb and gutter system, delivering it to prepared spreading zones such as vegetated filter strips.

Advantages

- Prevents the discharge of stormwater runoff from impervious surfaces to unsuitable roadside shoulders and adjacent slopes and therefore preventing erosion of these surfaces.
- Controls vehicle parking and prevents vehicle access to unpaved areas (L-shaped curbs only).
- Protects erosion control structures.
- Incorporating curb cuts increases the time of concentration, thus reducing the peak rate of runoff.

Disadvantages

- Concentrates the volume of runoff and increases the erosive potential of runoff. This potential disadvantage can be mitigated by installing curb cuts.
- Limits potential infiltration, unless curb cuts are incorporated.
- Requires reliable periodic sweeping.
- L-shaped curbs are susceptible to damage from a snowplow.

DESIGN CONSIDERATIONS

- The following guidelines are water quality design considerations for culverts. Refer to applicable drainage design manuals within the responsible jurisdiction for requirements associated with structural integrity, drainage design, public safety, and other factors.
- Curb and gutters should be designed by a licensed professional civil engineer.
- Concrete curbs are preferred over asphalt curbs because they are less susceptible to damage from snowplows.
- Rolled curbs are less prone to damage from a snowplow but they are not a parking deterrent, so parking barriers will need to be installed adjacent to the curb to prevent vehicle access to unpaved areas.
- L-shaped curbs provide a better vehicle barrier, but are highly susceptible to snowplow damage. Additional parking barriers may still be required when there is an L-shaped curb, depending on the site.
- Incorporate low impact development into the design of a curb and gutter system by installing curb cuts where feasible. Runoff will exit through the curb cut into an adjacent surface-spreading system, such as a vegetated swale which will provide a reduction of flows and facilitate infiltration.



Curbs convey clean stormwater from a road, preventing it from discharging down the steep slope, potentially causing erosion.



*This rolled curb is conveying stormwater runoff from the parking lot but it **not** preventing vehicle encroachment to the unpaved shoulder.*

INSTALLATION CONSIDERATIONS

- Install a curb and gutter after the road and drainage infrastructure is in place.
- Install curb and gutters according to local, county, state, or federal specifications.
- Curb and gutters should be installed in short segments and installed in conjunction with a roadway slope stabilization BMPs to eliminate concentrated surface flows along the toe or over the top of slopes.
- If curb cuts are to be installed, install outlet protection/energy dissipaters at each cut (Refer to Section 4.3-d, Outlet Protection).

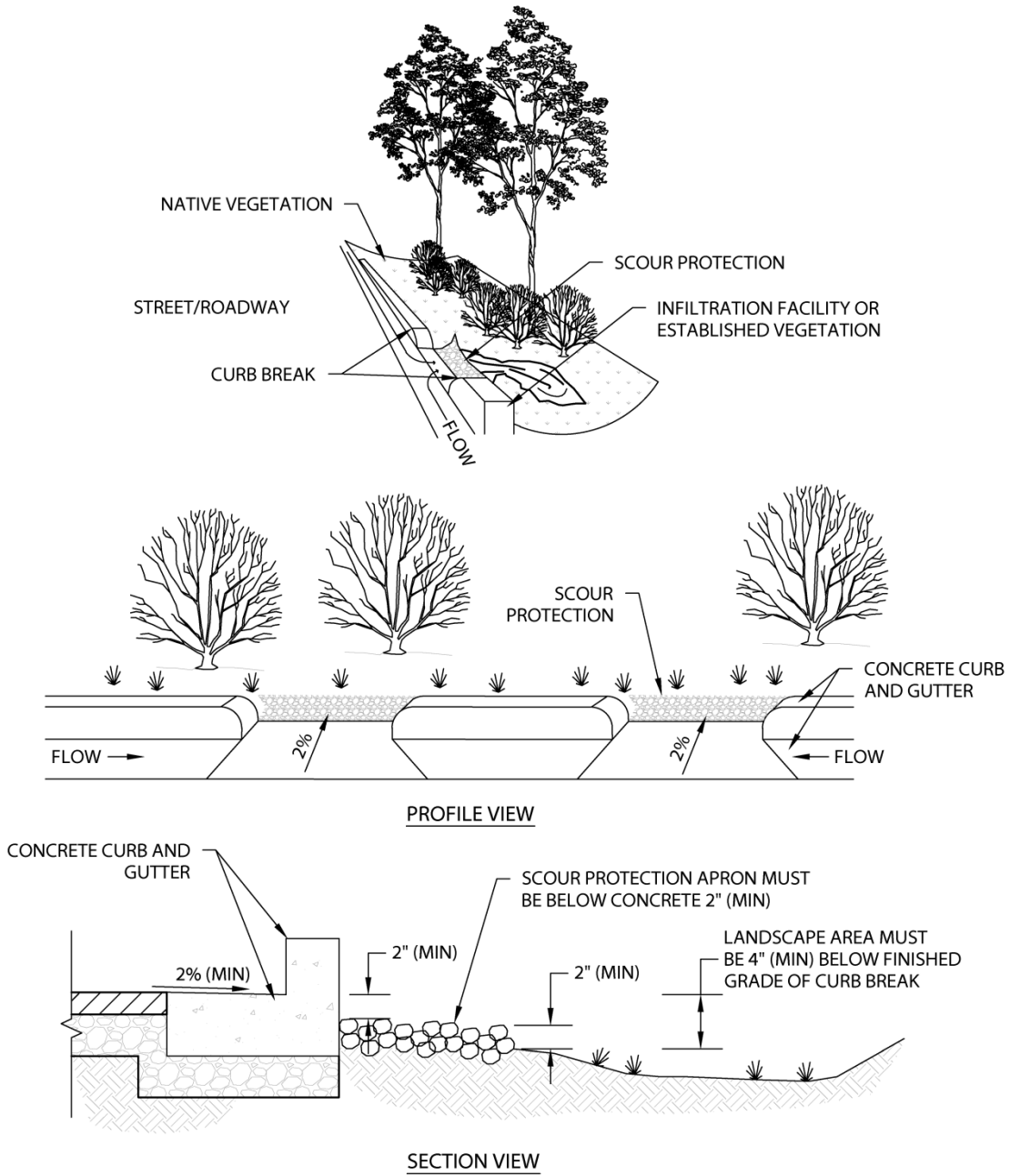
INSPECTION AND MAINTENANCE

- Curb and gutters should be inspected annually after spring snowmelt for accumulated litter, debris, and sediment, before the period of erosive summer thunderstorms.
- Remove pine needles, leaves, pinecones, sediment, and other large debris when visual inspection identifies the need. Also inspect systems for damage or signs of deterioration from weather, road maintenance equipment, and snowplow equipment. Repair or replace damaged sections as soon as possible.
- Employ a regular street sweeping program to keep the curb and gutter free of accumulated sediment.

EFFECTIVENESS CONSIDERATIONS

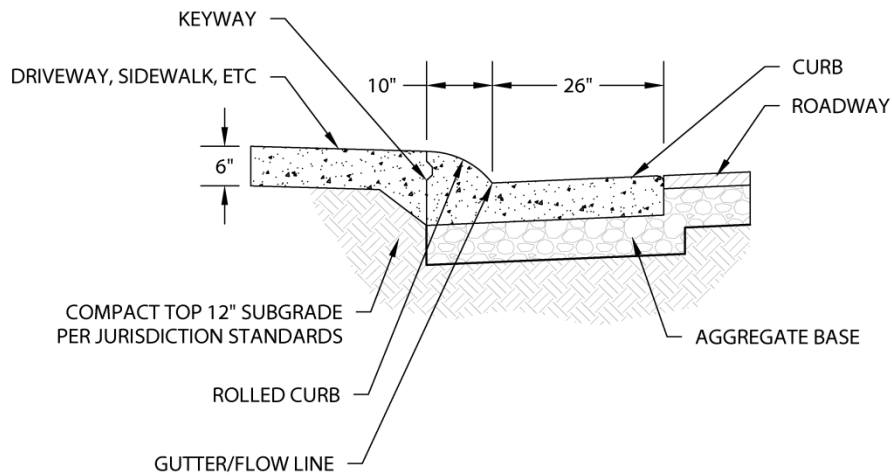
Curb and gutters are effective at conveyance if they are designed and installed properly. They lose effectiveness if damaged by snowplow or blocked by excess sediment and debris. A regular street sweeping program may assist in lowering pollutant loads in stormwater runoff from roads with curb and gutter. Curb and gutter systems create directly connected impervious areas and must be planned and installed in association with other hydrologic and source control BMPs.

Curb Break Figure



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Rolled Curb Figure



NOTES:

1. THE STRUCTURAL THICKNESSES AS REPRESENTED ARE MINIMUM REQUIREMENTS, LARGER DIMENSIONS MAY BE REQUIRED BASED ON ACTUAL SOIL CONDITIONS, OR PROJECT APPROVALS.
2. CONSULT WITH YOUR LOCAL JURISDICTION FOR STANDARD DETAILS.
3. ROLLED CURBS ARE MORE DURABLE WHERE SNOW PLOWING OCCURS. HOWEVER, VEHICLES CAN EASILY DRIVE OVER ROLLED CURBS.

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