

DESIGN AND CONSTRUCTION GUIDELINES AND STANDARDS

DIVISION 7 • THERMAL & MOISTURE PROTECTION

07 45 00 • GUTTERS AND DOWNSPOUTS

SECTION INCLUDES

Gutters and Downspouts

RELATED SECTIONS

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07 20 00 Building Insulation and Moisture Protection
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DESIGN

When designing new 1-2 story buildings, architects should design ample roof overhangs, durable perimeter foundation and siding materials to minimize the need for gutters. Gutters have traditionally been a high maintenance item, even with gutter guards.

For existing buildings, where gutters are not installed, do not install gutters unless they will be maintained. In certain instances, gutters can be useful to mitigate basement flooding, however options such as site grading should be considered first. Gutters can also contribute to basement flooding and building siding damage if they are not properly designed and maintained.

For buildings designed with gutters: seamless aluminum gutters should be sized to adequately manage the rain water collected by the roof and to properly fit the scale of the building.

Attach gutters with brackets (where metal clad roof fascia is installed). Specify strap type hangers with screw fasteners; avoid spikes and ferules.

When replacing roof shingles in one-story buildings with adequate roof overhangs, consider alternatives to gutters such as shrubs planted around building, a 4'-6" layer of crushed stone at the perimeter of the building and durable siding materials to withstand roof run-off. Eliminating them, except where necessary, can reduce maintenance.

Gutter guards range in price, durability and required maintenance. Consider designing larger gutters and downspouts first, rather than installing gutter guards. If gutter guards are installed, expanded metal type are preferred.

Pay special attention to details to avoid water getting behind the gutters. Typically the front edge of the gutter should be at least ½" below the plane of the roof.

Locate downspouts so that water runs away from the buildings. Install downspout strap hangers using a minimum .032" thickness straps, screwed, (not nailed) into building sheathing at 24" o.c. for the lowest 8' of downspout and at 48" o.c. for the upper portions. Do not use cast aluminum spike type downspout hangers.

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Consider lawn and landscape maintenance and locate downspouts and splash blocks in locations least likely to impede the path of lawn mowers

Include precast concrete splash blocks on every gutter installation. Identify vandal-prone areas and specify heavier splash blocks to make it more difficult for them to be moved.

At buildings which have experienced basement flooding, downspouts with longer extensions and splash blocks should be carefully placed, such as within a border of shrubs. Avoid trip hazards and exposure to damage from activities occurring around the building.

Where possible, downspouts from upper roofs should not be placed to discharge directly onto lower roofs, but rather should carry water in downspouts all the way down to grade.

When re-using existing underground storm water drainage systems with new replacement gutters, verify that the underground system is functional before installing new downspouts into hubs. Where system is not functioning properly, install downspouts with splash blocks in lieu of the underground system

MATERIALS

Seamless aluminum gutters are available in a variety of profiles with 5" and 6" ogee profiles being most common. Clearly specify the necessary size and profile.

Size downspouts to match gutter size and to manage rainwater design load.

Specify .027" thick aluminum drip edges at all eaves and rakes.

Provide aluminum gutters in .032" thickness and aluminum downspouts in .024" thickness.

If vandalism is an issue that cannot be solved with additional downspout straps, consider using either galvanized steel or PVC schedule 40 or even schedule 80 PVC pipe as downspouts.

Specify pre-cast concrete splash blocks (large and heavy enough to prevent being accidentally displaced or stolen) at the base of downspouts unless there is an underground storm drain system.

Do not use wood gutters. If refurbishing wood gutters which are structurally sound and in a historic renovation, consider lining them with copper.

Do not use plastic gutters.

If steel gutters and downspouts are used, seamless gutters are not readily available. 20' lengths with seamed and sealed joints should be specified.

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EXECUTION

Follow manufacturer's recommendations and standard professional practice.

When installing gutters into underground storm drainage systems, include adequate cleanouts at the locations where the downspouts tie into the underground systems and at drywells. These locations should be designed to facilitate future maintenance and to eliminating obstructions at the connections where they are most likely to occur.

In high vandalism areas consider additional measures to insure the gutters and downspouts remain properly secured to the building.