

PHASE 1

(part of roadway reconstruction)



DESCRIPTION

BIO-RETENTION BASIN

- Vegetated basins composed of engineered soils to promote infiltration and nutrient uptake
- Pollutant removal mechanisms
 - » Adsorption to soil, plant uptake, microbial processes, exposure to sunlight, sedimentation, filtration, infiltration

Possible locations:

- On west side of Wilson Drive in the reclaimed green space between Alpine and Congress, at intervals similar to typical inlet spacing (~200 feet)
- On west side of Wilson Drive adjacent pedestrian pathways at Alpine & Kensington
- In Wilson Drive median

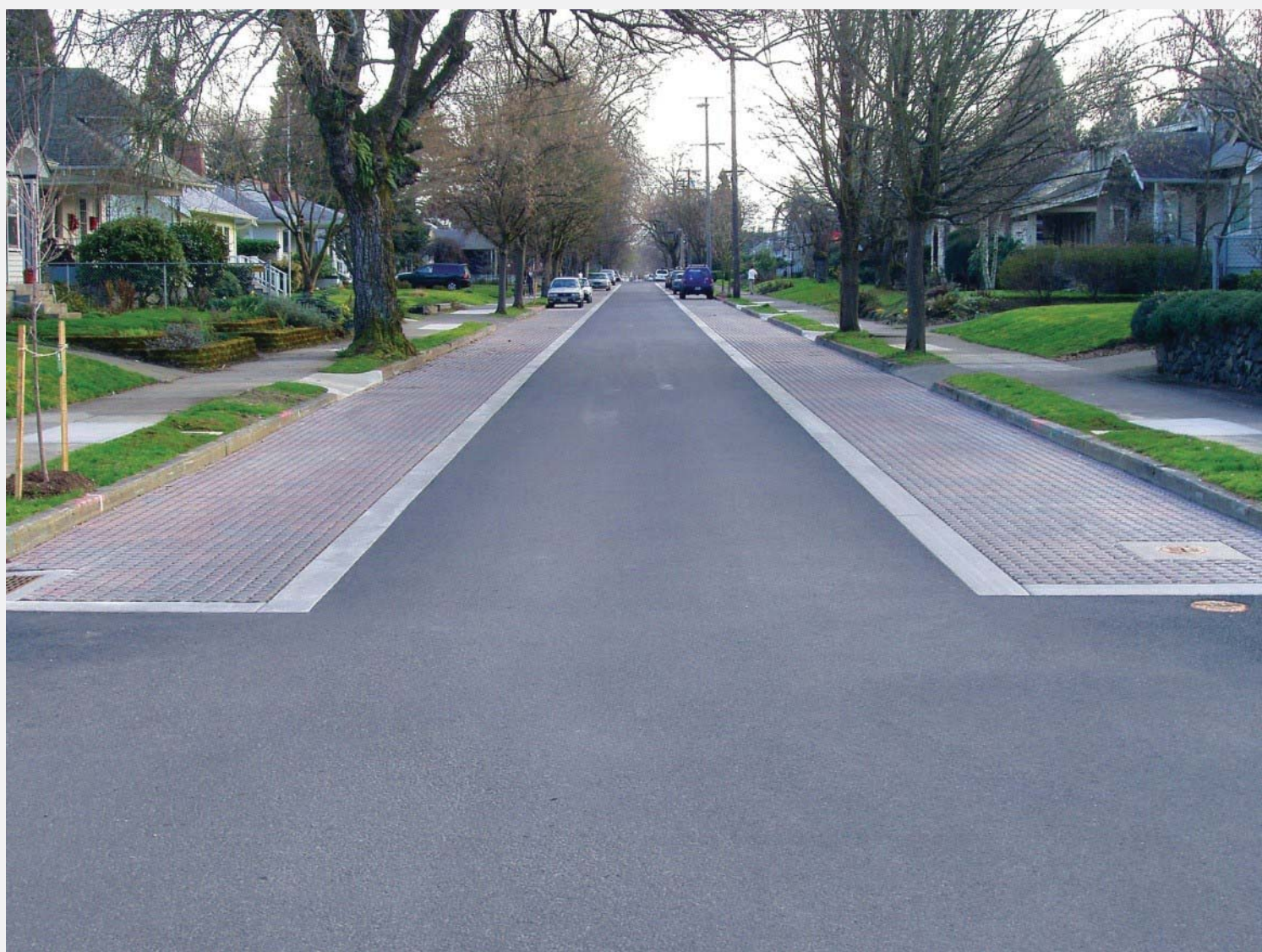
ADVANTAGES AND ISSUES

Advantages

- A maximum treatment credit of 80% total suspended solids (TSS) and 35% total phosphorous (TP) removal is achievable for flows exiting via the underdrain; effectiveness of the design is influenced by native soil infiltration rates.
- Aesthetically pleasing; can contribute towards neighborhood character when installed in series
- Low plantings don't interfere with sight-lines for road users (not an issue on the west side of Wilson Drive)

Issues

- Requires frequent maintenance in the form of weeding & litter removal, similar to existing installation at end of Olive St.
- Preferably these would be located to avoid interfering with snow storage, which occurs between Marlborough and the Village limits but is more concentrated north of Congress.



PERMEABLE PAVEMENT

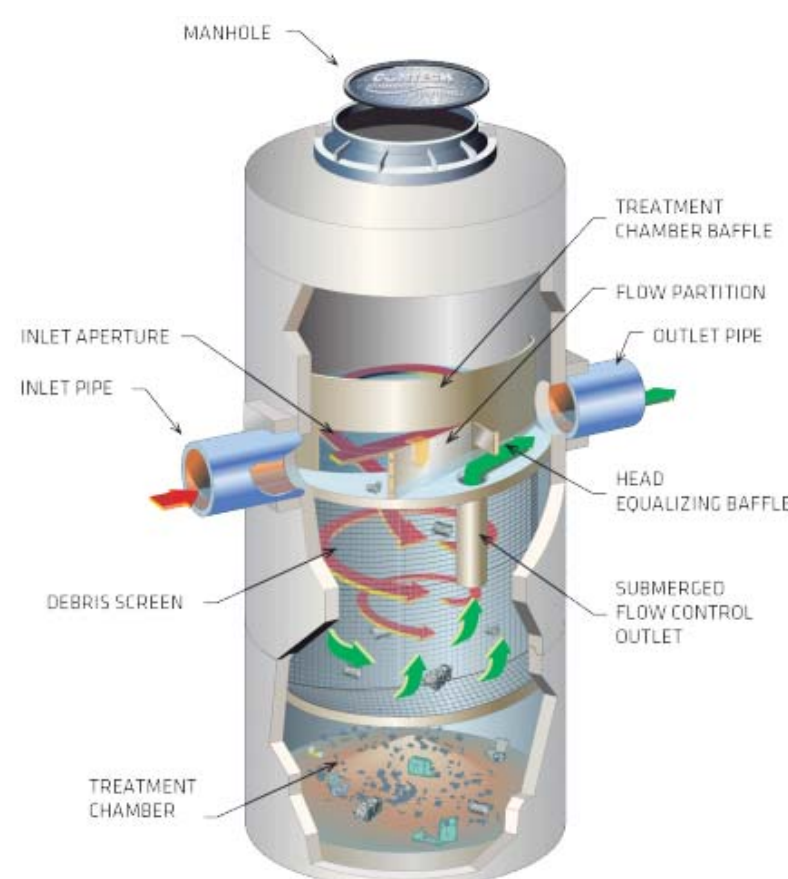
- The parking lane on the east side is 8 feet wide, with a width available for permeable pavement of 6 feet. The cumulative available length is approximately 3200 feet (in segments of up to 500 feet)
- Maximum run-on ratio is 3:1 (WDNR Conservation Practice Standard 1008), meaning up to 24 feet of road profile could drain towards an 8-foot wide strip. A conventional high-crown design would result in 16 feet of roadway draining to the 8ft strip i.e. a run-on ratio of 2:1 which is desirable and will reduce maintenance frequency.
- Can be placed flat with 0% cross slope, or at a cross slope matching the asphalt roadway, noting that asphalt contractors may require a minimum gradient of 1% to guarantee their work.
- Pollutant removal mechanisms:
 - » Adsorption, filtration, infiltration, reduces the need for salt application

Possible locations

- In the parking lane on the east side of Wilson Drive
- In the parking lanes of Wilson Drive south of Olive Street

Advantages

- A maximum treatment credit of 65% total suspended solids (TSS) removal and 35% total phosphorous (TP) removal is achievable for flows exiting via the underdrain; effectiveness of the design is influenced by native soil infiltration rates.
- Visually delineates the parking lane from the travel lanes, which can contribute to road safety and promotion of a lower speed environment.
- Aesthetically pleasing, can contribute to neighborhood character
- Maintenance regime can be minimal, typically undertaken with a vacuum truck. Some systems such as PaveDrain do not require backfilling of gaps between pavers with stone or sand, resulting in long intervals between maintenance.



GROSS POLLUTANT TRAP / HYDRODYNAMIC SEPARATOR

- Underground stormwater treatment devices which use hydrodynamic forces to separate and settle out sediment and other pollutants.
- Separates and traps trash, sediment and oil from stormwater runoff.
- Sediment settles into an isolated sump while floatables and neutrally buoyant pollutants are captured in the separation cylinder.

Possible locations

- Along the Wilson Drive corridor

Advantages

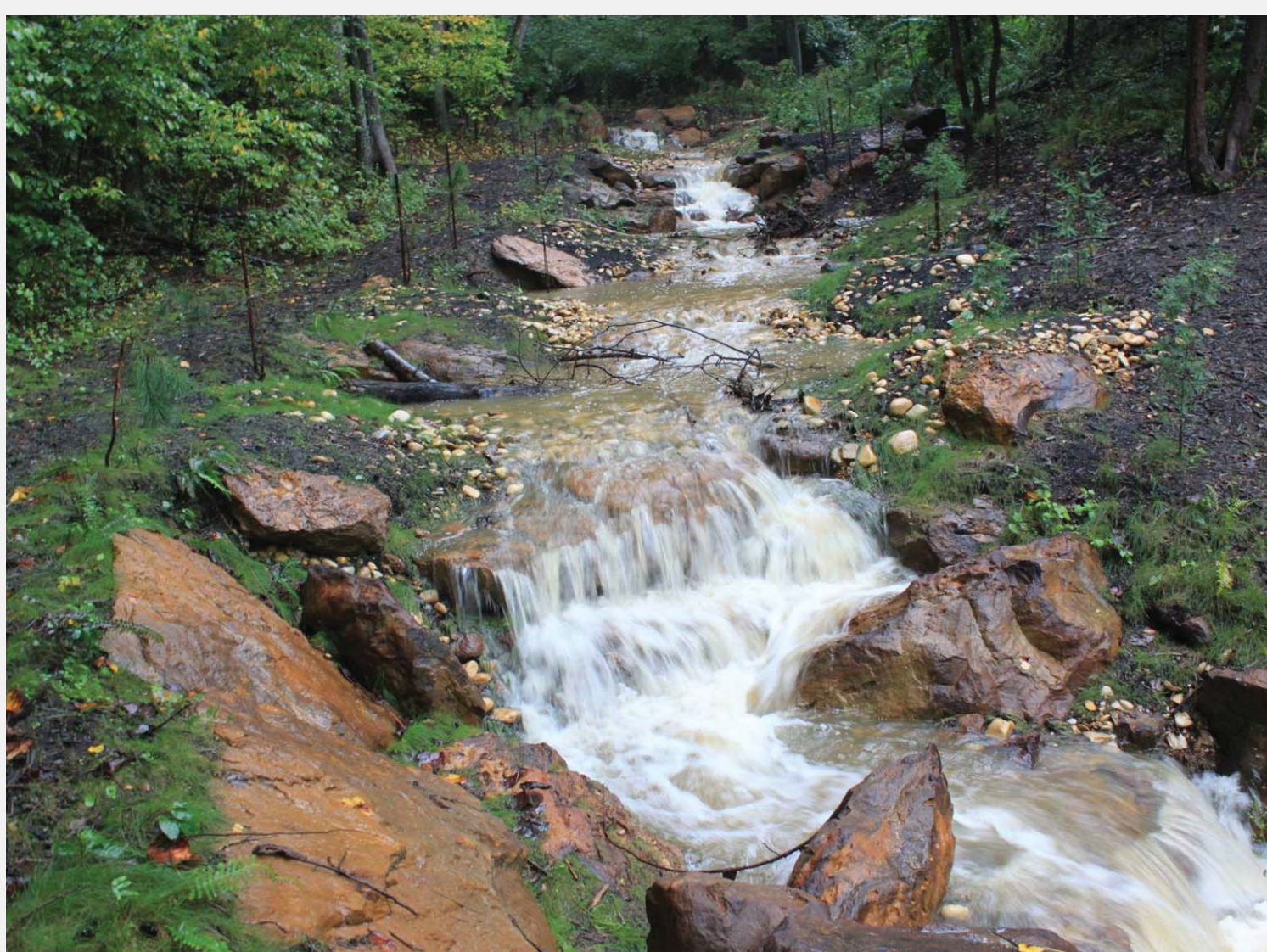
- Unobtrusive; would not detract from the appearance or function of greenway gardens.
- Isolated storage sump reduces or eliminates the re-suspension of accumulated sediment in a high-flow rainfall event.

Issues

- Regular maintenance is required with a vacuum truck.
- Generally, not designed to capture small particle sizes below 150 microns. Accordingly, regulatory credit for TSS removal may vary across proprietary products.

PHASE 2

(potential implementation post-roadway reconstruction)



REGENERATIVE STORMWATER CONVEYANCE (RSC)

- RSC is a series of pools and riffles which forces flows to the subsurface, promote infiltration and avoids erosion
- The channel bed is composed of carbon-rich material, including woodchips, to capture pollutants while promoting infiltration.
- Local example from North Point Lighthouse to Bradford Beach
- Pollutant removal mechanisms
 - » Adsorption to soil, plant uptake, microbial processes, exposure to sunlight, sedimentation, filtration, infiltration

Possible location

- From the intersection with Kensington, into nearby existing ravine in Estabrook Park

Advantages

- Can convey, manage and treat stormwater runoff
- The one known local example was funded in partnership with Milwaukee County Parks
- Aesthetically pleasing; can contribute towards park amenity

Issues

- Land not under the control of the Village of Shorewood; would need to partner with Milwaukee County Parks
- To obtain a high value, in terms of water-quality treatment, from the installation may require directing some storm sewer from the residential area sub-catchment to the upstream end.