

LID Techniques: Commercial Property

Rainwater Harvesting

Large scale rainwater harvesting works like rain barrel water collection on a residential property, only on a larger scale. Rather than using barrels to harvest rainwater that runs off of catchment areas (like your roof or parking areas), **Storage Tanks** or **Cisterns** are more suitable for large properties and can hold up to 40,000 litres of water. Cisterns can be installed both indoors and outdoors and the water can be used for irrigation on your property or even for flushing your toilets. Contact licensed professional services and obtain all approvals to install large cisterns.

Notes:

- Like their smaller cousins rainbarrels, large cisterns and storage tanks should have protection from frost and a safe overflow route.
- If a cistern is to be installed outdoors and underground, ensure that it is buried below the frost line to avoid freezing and cracking.
- It is crucial to consider Ontario's Building Codes, specifically Plumbing Codes, if harvested water is intended to be used for toilets.
- Design and maintenance of an outdoor cistern needs to include considerations to eliminate conditions ideal for mosquito breeding.
- Safety is a big concern for above ground cisterns stored indoors. They should be locked to prevent unauthorized access, especially children.
- For any project involving digging around your property, use the [Ontario One Call](#) system for utility locates before your dig.

Bio-retention Areas

Bio-retention areas are like large rain gardens for commercial properties. These structures collect, store and filter stormwater runoff. The main differences are that Bioretention areas are generally larger than rain gardens that would be built on a residential property and that a Bio-retention area may also have full or partial drains beneath it to assist drainage. If there is no drain beneath a Bio-retention area, and soil conditions allow it, collected stormwater is filtered into the ground.

Like rain gardens, Bioretention areas are depressions that are filled with permeable soil, flood tolerant plants, stone and wood chips. They can be built into a lawn area, and are also popular around parking lots, raised landscaping planters, extended tree beds and in islands surrounded by paved or concrete surfaces.

Notes:

- Bio-retention areas should be built in low traffic areas away from heavy vehicle traffic, road salting, vehicle maintenance or fuelling stations and areas

where hazardous materials are handled or stored to avoid potential groundwater and soil contamination.

- It is best to build a Bioretention area at least four metres from a building's foundation with a trench or piping to connect the downspouts or runoff to the garden to avoid potential flooding situations.
- Bio-retention areas need routine maintenance to remove litter, maintain plant size and be checked for clogging.
- For any project involving digging around your property, use the [Ontario One Call](#) system for utility locates before your dig.

Soakaway Pits, Infiltration Chambers and Trenches

Large underground soak-away pits on commercial properties work the same way that they do on residential properties. Infiltration Chambers and Trenches are like soak-away pits in that they create artificial void space underground to collect rainwater and allow it to soak slowly into the ground. Infiltration Chambers are large modular plastic, open-bottomed devices with perforated sides that are generally found beneath parking lots or other impervious areas. Their purpose is to temporarily store stormwater runoff from the site to filter into the ground beneath a sizeable impervious area like asphalt pavement.

Infiltration trenches are similar to infiltration chambers, with the main difference being that they are long and narrow. These are often installed alongside or beneath walkways, sidewalks and narrow patches of land between buildings where there is enough distance from the building foundation.

Notes:

- If the ground on your property has a lot of clay in the soil, Infiltration Chambers and Trenches may not be the best option for you. A lot of clay in the soil can make it difficult for water collected in the pit to escape and could result in overflow onto your property.
- Chambers and trenches should be built in low traffic areas away from heavy vehicle traffic, road salting, vehicle maintenance or fuelling stations and areas where hazardous materials are handled or stored to avoid potential groundwater and soil contamination.
- A long-term maintenance plan should be considered for chambers and trenches to keep them from backing up.
- Chambers and trenches should be built at least four metres from a building's foundation to avoid potential flooding situations.
- For any project involving digging around your property, use the [Ontario One Call](#) system for utility locates before your dig.

Permeable Surfaces

Permeable surfaces present an option when the looking to have an area that is both paved and stormwater penetrable. These pavers are specifically designed to allow water to filter through them (pervious concrete and porous asphalt) or are installed in a manner that allows water to penetrate between precast sections of the pavers (permeable interlocking concrete and plastic or concrete grid systems).

Like Bioretention areas, permeable surfaces can have different levels of filtration.

The first would be full infiltration, where all of the stormwater is intended to penetrate into the ground below the permeable surface.

Second is partial infiltration, which includes a drain in the ground below the permeable surface to carry overflow to a catchbasin while the remainder of the stormwater infiltrates the ground.

Third, there is a detention and filtration method that uses a pipe to carry stormwater to a catchbasin, most likely because the ground below the permeable surface is densely packed (clay), which does not allow much infiltration.