ARTIFICIAL GRASS MISSISSAUGA · RESEARCH SERIES

Stormwater & Backyards: Mississauga Drainage Resilience Review

Two 100-year storms in a single month put backyard drainage on the agenda — what an engineered turf base can, and cannot, do for Mississauga homes

REPORT	RR-2026-MIS-03 · August 2026
COVERAGE	City of Mississauga, Regional Municipality of Peel, Ontario
PREPARED BY	Artificial Grass Mississauga Research, Mississauga, Ontario
CONTACT	+1 289-536-8867 · artificialgrassmississauga.ca

Artificial Grass Mississauga Research publishes data-driven local studies on residential landscaping, water use and outdoor surfaces in Mississauga and the Greater Toronto Area. This report is provided free for information purposes.

ABSTRACT

This report reviews Mississauga's recent flood record — the July 8, 2013 flash flood and the two 100-year storms of July and August 2024 — alongside published descriptions of how water moves through an engineered artificial-turf system, and asks where a synthetic lawn honestly fits in a flood-resilient Mississauga backyard. Every input is drawn from published sources: City of Mississauga event documentation, Environment and Climate Change Canada records, Insurance Bureau of Canada releases and the City's stormwater charge pages. Derived figures are labelled with their inputs where they appear.

The findings are deliberately two-sided. The exposure is real: a typical 500 sq ft Mississauga yard received about **4.9 m³ of rain in four hours on July 16, 2024**, and about 6.0 m³ on August 17, 2024 — Toronto Pearson's rainiest day on record at **128.3 mm**. A well-built turf base gives that water a designed path instead of a compacted-clay lottery, and keeps the yard usable between storms. But turf is not a flood fix: basements are protected by grading, downspout management and plumbing, and Mississauga's rooftop-keyed stormwater charge — **$128.90 for a medium detached home in 2026** — does not change with the lawn.

KEY FINDINGS AT A GLANCE

128.3 mm	≈4.9 m³	22,528 m³	$128.90/yr
rain at Toronto Pearson on Aug 17, 2024 — the station's rainiest day on record	rain landing on a 500 sq ft yard in four hours, July 16, 2024 (depth × area)	detained by Cooksville Creek stormwater ponds during the July 16, 2024 event	2026 stormwater charge, medium detached home — keyed to rooftop, not lawn

Contents

1 Mississauga's flood story: three storms that reset the baseline

Mississauga's stormwater conversation is no longer hypothetical. On **July 8, 2013**, a TRCA gauge near Pearson Airport recorded **138 mm of rain in about ten hours**, with a peak one-hour rate of 79 mm; the city saw thousands of flooded basements, the Dixie Road underpass flooded, and roads and transit shut down. At roughly $932 million in damages it was, at that time, the costliest storm in Ontario's history [1].

Summer 2024 then delivered two benchmark events within one month. On **July 16, 2024**, approximately **106 mm fell between 8 a.m. and noon** — part of a two-day total near 133 mm — exceeding the 100-year design storm in parts of the city. Cooksville Creek peaked at 4.1 m; Mississauga Fire responded to more than 160 incidents, including water rescues and the evacuation of 113 seniors; roughly 1,000 residential flooding reports were logged, and municipal damage exceeded $3 million. The GTA-wide July 15–16 event caused over $940 million in insured damage [2][3]. On **August 17, 2024**, Toronto Pearson recorded **128.3 mm — the rainiest single day ever measured at that station**, surpassing the 2013 record — while some Mississauga gauges saw up to ~170 mm over August 17–18, with intensities up to 84 mm/h. Highways 401, 403 and 410 flooded, with boat rescues on Highway 410; Malton, Applewood, Cooksville, Lisgar and Streetsville were hit, and insured damage topped $100 million [4][5].

Together the two 2024 storms made Mississauga the epicentre of Ontario's costliest flood season, pushing provincial summer flood losses past $1 billion — the second-costliest summer for weather damage in the province's history [3][5]. The climate backdrop explains the pattern: Pearson's 1981–2010 normals show 785.9 mm of annual precipitation, well distributed through the year, with August the wettest month (~78.1 mm) — summer rain arriving in intense convective bursts, exactly as both 2024 storms behaved [6]. Table 1 summarizes the three events.

Table 1 — The three storms that define Mississauga's modern flood record. *Sources: [1][2][3][4][5].*

Event	Recorded rainfall	Recorded local impacts
July 8, 2013	138 mm in ~10 h (peak 79 mm/h near Pearson)	Thousands of flooded basements; ~$932M in damages — Ontario's costliest storm to that date
July 16, 2024	~106 mm in 4 h (8 a.m.–noon); ~133 mm over two days	Cooksville Creek at 4.1 m; 160+ fire incidents; ~1,000 residential flooding reports; GTA insured losses >$940M
Aug 17, 2024	128.3 mm at Pearson (station record); up to ~170 mm locally over 2 days	Highways 401/403/410 flooded; Malton, Applewood, Cooksville, Lisgar, Streetsville hit; insured losses >$100M

LOCAL CONTEXT — COOKSVILLE CREEK

Cooksville Creek is Mississauga's most flood-prone watercourse. After the 2024 storms, Council approved a Flood Mitigation Action Plan including a Cooksville Creek check valve and creek restoration projected at $7.8 million by 2032. The watershed's stormwater ponds detained **22,528 m³ — about nine Olympic swimming pools** — during the July 16, 2024 event alone [2].

2 How water moves through an engineered turf system

Hydrologically, an artificial lawn is a layered construction, not a carpet. Rain passes through the turf backing — perforated in most landscape products, while some specialty products use knitted backings marketed for full-surface drainage (ForeverLawn's K9Grass, a pet-turf product, advertises "100% edge-to-edge drainage" [11]) — then through the granular infill into an open-graded aggregate base. The base is the workhorse: its stone voids store and convey water while it infiltrates into the subgrade or moves laterally toward a drainage route. Published permeability claims vary by product and test method; none in our source set could be verified against a fetched specification, so this report quotes none.

The base matters most on Peel's soils. Heavy clay, common across the region, holds water and heaves in freeze-thaw cycles, so quotes in the Mississauga area routinely include deeper bases and drainage grading [12]. A well-built base turns a cloudburst into a queue: water enters stone at the surface instead of ponding on compacted soil, then releases at the rate the subgrade accepts.

What does a Mississauga storm actually deliver to one yard? Figure 1 applies the recorded rainfall depths to a typical 500 sq ft (46.45 m²) backyard (1 mm over 1 m² = 1 litre; uniform depth assumed). Across a normal year, roughly **36.5 m³ of precipitation** lands on that yard; the July 16, 2024 storm delivered about 4.9 m³ of it in four hours.

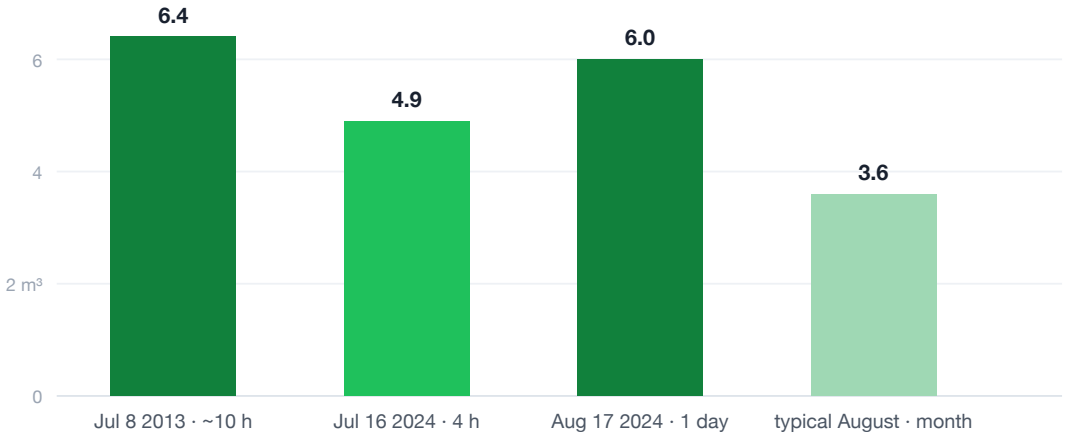

Figure 1 — Rain delivered to a typical 500 sq ft (46.45 m²) Mississauga backyard, per event, computed as recorded depth × area (1 mm over 1 m² = 1 L; uniform depth assumed). *Rainfall records: [1][2][4][6]; derivation in §M.*

Table 2 — Layers of an engineered residential turf system and what each does with stormwater. *Sources: published manufacturer and installer base-prep descriptions [11][12]; §M.*

Layer	Typical build	Drainage function
Turf carpet & backing	perforated, or knitted in drainage-first products [11]	admits rainfall across the whole surface
Infill	granular, product-dependent	holds the pile open so water reaches the backing
Engineered base	compacted open-graded aggregate; deeper on clay [12]	temporary storage and conveyance — the workhorse
Subgrade	native soil; heavy clay common across Peel [12]	final infiltration step; the slowest layer on clay

3 Turf vs natural lawn on infiltration: a balanced reading

Does swapping the lawn change how a lot takes water? The evidence cuts both ways, and this report presents both. **In turf's favour:** many Mississauga lawns sit on thin topsoil over subsoil compacted during construction, and a compacted, thatched lawn on clay can shed an intense burst nearly as fast as it lands. Replacing that profile with an open-graded engineered base substitutes a designed drainage path for an accidental one [12] — which is why well-built turf yards are typically puddle-free and back in use soon after a storm.

Against overclaiming: a healthy, deeply rooted natural lawn is itself a competent infiltration medium — living soil stores water, roots open channels, and evapotranspiration returns moisture to the air between storms. Artificial turf removes that living layer. And on Peel's clay subsoils, the final infiltration step is slow no matter what the surface is [12]. The honest summary: in a cloudburst, an engineered base can outperform a tired, compacted lawn; over a season, a thriving lawn's living soil does work that no aggregate can. **Neither surface prevents basement flooding** — that job belongs to the measures in Section 4.

One number settles a recurring sales claim. Mississauga's stormwater charge is billed on the Peel water bill in five rooftop-area tiers; a medium detached home pays **$128.90 in 2026**, with tiers spanning $64.45 to $219.13 [7]. Because the charge is keyed to the rooftop, not the lawn (Figure 2), converting to artificial turf does not reduce it — homeowners should treat any claim to the contrary with scepticism.

Figure 2 — Mississauga's 2026 stormwater charge: five rooftop-area tiers span $64.45–$219.13/yr (smallest, medium and largest shown). The charge keys to rooftop area, so lawn-surface choice does not change it. *Source: City of Mississauga stormwater charge page [7].*

LOCAL CONTEXT — WHO GETS STORMWATER RELIEF IN MISSISSAUGA

The City's stormwater credit program (up to 50%) is open only to non-residential and multi-residential properties. Homeowner incentives for rain barrels, rain gardens and permeable pavement were considered in 2012–2013 and rejected because administrative costs would outweigh the benefits, per the City's five-year review; the only residential relief is a stormwater-charge subsidy for low-income seniors and persons with disabilities [7][8].

4 What actually protects basements

Basements flood when water arrives at the foundation faster than it can be taken away, or when municipal sewers surcharge — both mechanisms were on display across Mississauga in 2024 [2]. The defences are unglamorous, and none of them is a lawn surface. Table 3 sets out the standard stack and where a turf project honestly fits within it.

Table 3 — The basement-protection stack, and where artificial turf fits. *Framing: §M; event context [2].*

Measure	What it does	Where turf fits
Lot grading	positive slope carries surface water away from the foundation	a turf base must preserve the same falls — not flatten them
Downspout management	extensions move roof water away from the house	turf edges and seams should never block discharge routes
Backwater valve & sump pump	block sewer surcharge; remove foundation seepage	unrelated to surface choice; essential in flood-prone areas
Window wells & sealing	keep below-grade openings drained and tight	unaffected by lawn surface
Permeable, puddle-free yard	limits ponding; keeps the yard usable between storms	**turf's real role** — liveability, not flood proofing

Where turf genuinely helps is liveability: a yard that drains through its base instead of ponding on compacted clay returns to use quickly after events like those of 2024, and the mud-and-rutting cycle disappears. But no homeowner should buy turf as flood protection — the protection budget belongs to grading, downspouts and plumbing.

5 Design notes for Mississauga lots

Mississauga's housing stock frames the design problem. The 2021 Census records 244,575 occupied private dwellings, 37.1% of them single-detached (90,660 homes) and 70.4% owner-occupied [9]. Typical detached lots run 30–50 ft wide by 100–130 ft deep; established premium neighbourhoods such as Lorne Park and Mineola often exceed 50 × 150 ft with mature tree canopy, while newer gentle-density subdivisions offer progressively smaller backyards [10].

- **Respect the clay.** Heavy Peel clay holds water and heaves in freeze-thaw cycles; budget for a deeper engineered base and drainage grading rather than a thin screed [12].
- **Keep an overflow route.** In a storm that exceeds the base's storage, water needs a defined surface path — to the street or swale — that respects property lines and stays clear of neighbouring lots.
- **Scale changes little.** Even a compact 300 sq ft (27.9 m²) newer-lot yard took on roughly **2.3 m³ in the peak hour of August 17, 2024** (84 mm/h × area) — small yards face the same intensities as large ones.
- **Sequence the work.** In the neighbourhoods named in the August 2024 flooding — Malton, Applewood, Cooksville, Lisgar, Streetsville [4] — surface choice is secondary: grading, downspouts and plumbing come first, then the surface.

M Methodology & data sources

This is a desk-research report. Published figures were collected in August 2026 from the sources listed under References: City of Mississauga council documentation of the July and August 2024 extreme rainfall events, Environment and Climate Change Canada's 2024 weather-stories review and 1981–2010 climate normals (Toronto Pearson Int'l A, located in Mississauga's Malton neighbourhood), Insurance Bureau of Canada releases, The Pointer's retrospective on the July 8, 2013 storm, the City's stormwater charge page and its Stormwater Charge Credit Program five-year review, the City's planning data hub (2021 Census), a brokerage neighbourhood guide, and published manufacturer and installer descriptions of turf construction.

Derived figures and stated assumptions. Yard water volumes are computed as recorded rainfall depth multiplied by yard area — 46.45 m² for a 500 sq ft yard, 27.9 m² for a 300 sq ft yard — using 1 mm over 1 m² = 1 litre and assuming uniform depth across the lot. That is an idealization: real lots have roofs, trees, slopes and flow paths, so figures such as "4.9 m³ in four hours" describe the rain that fell on the yard's footprint, not the water any surface actually held. Product-specific drainage claims are attributed to the specific product and manufacturer (e.g. K9Grass's knitted backing) and never generalized to a product category. No per-hour turf permeability rates are quoted, because none in the source set could be verified against a fetched specification; drainage performance is therefore presented qualitatively. The basement-protection framing in Section 4 is standard practice presented without invented statistics.

Limitations

This report is not a site assessment, an engineering study or drainage-design advice for any specific property. Rainfall records are point measurements — gauges varied across the city during the 2024 events (128.3 mm at Pearson versus ~170 mm at some Mississauga gauges on August 17–18). The 1981–2010 climate normals predate both 2024 storms. Infiltration on any specific lot depends on soil, compaction and maintenance history. Dollar figures are nominal event-wide totals, not per-property losses, and insured-damage figures exclude uninsured losses.

R References

1. The Pointer — Reflecting on the devastating 2013 storm: Mississauga takes lead in municipal flood resilience. https://thepointer.com/article/2023-07-30/reflecting-on-the-devastating-2013-storm-mississauga-takes-lead-in-municipal-flood-resilience (accessed August 2026).
2. City of Mississauga — July and August 2024 Extreme Rainfall Events Update. https://pub-mississauga.escribemeetings.com/filestream.ashx?DocumentId=60005 (accessed August 2026).
3. Insurance Bureau of Canada — July flash floods in Toronto and southern Ontario caused over $940 million in insured damage. https://www.ibc.ca/news-insights/news/july-flash-floods-in-toronto-and-southern-ontario-caused-over-940-million-in-insured-damage (accessed August 2026).
4. Environment and Climate Change Canada — Canada's 10 most impactful weather stories of 2024. https://www.canada.ca/en/environment-climate-change/services/ten-most-impactful-weather-stories/2024.html (accessed August 2026).
5. Insurance Bureau of Canada — August flooding in GTA and parts of southern Ontario caused over $100 million in insured damage. https://www.ibc.ca/news-insights/news/august-flooding-in-gta-and-parts-of-southern-ontario-caused-over-100-million-in-insured-damage (accessed August 2026).
6. Environment and Climate Change Canada — Canadian Climate Normals 1981–2010, Toronto Lester B. Pearson Int'l A. https://climate.weather.gc.ca/climate_normals/results_1981_2010_e.html?searchType=stnProx&txtRadius=25&optProxType=station&coordsStn=43.666667%7C-79.4%7CTORONTO&txtCentralLatMin=0&txtCentralLatSec=0&txtCentralLongMin=0&txtCentralLongSec=0&climate_id=6158733&dispBack=0&wbdisable=true (accessed August 2026).
7. City of Mississauga — Stormwater charge. https://www.mississauga.ca/services-and-programs/home-and-yard/stormwater/stormwater-charge/ (accessed August 2026).
8. City of Mississauga — Stormwater Charge Credit Program 5 Year Review. https://pub-mississauga.escribemeetings.com/filestream.ashx?DocumentId=6752 (accessed August 2026).
9. City of Mississauga Planning Data Hub — 2021 Census. https://city-planning-data-hub-1-mississauga.hub.arcgis.com/pages/census (accessed August 2026).
10. Sam McDadi Brokerage — Mississauga neighbourhood guide (typical lot dimensions). https://mcdadi.com/neighbourhoods/mississauga (accessed August 2026).
11. ForeverLawn — K9Grass product page (knitted backing, "100% edge-to-edge drainage"). https://k9grass.com/ (accessed August 2026).
12. Artificial Grass Brampton — 2026 pricing and base-preparation notes (heavy clay). https://artificialgrassbrampton.ca/blog/ (accessed August 2026).

CITE THIS REPORT

Artificial Grass Mississauga Research (2026). *Stormwater & Backyards: Mississauga Drainage Resilience Review*. AGM Research Series RR-2026-MIS-03, Mississauga, Ontario. https://artificialgrassmississauga.ca/research/turf-drainage-stormwater-resilience-mississauga/

Disclaimer. This report aggregates and analyzes publicly available data from the sources listed above. Figures marked as estimates or assumptions are derived from those published sources using the stated assumptions; they are not quotations, engineering measurements, or a substitute for a site-specific assessment. Artificial Grass Mississauga Research is the publications arm of Artificial Grass Mississauga, a residential artificial-grass installation company serving Mississauga and the GTA.