APPROVED SEPTEMBER 2023

LAKESHORE ROAD SOUTH ASSOCIATION

DRAINAGE PLAN

Lakeshore Road South Association

DRAINAGE PLAN

The Lakeshore Road South Association (LRSA) has prepared the following **Drainage Plan to guide design and future investment priorities for an improved drainage system that will effectively convey surface water and protect the integrity of the Association's private road.**

This Drainage Plan was developed by volunteer members of our Association. While professionals were contacted and serious consideration was given to hiring expertise to prepare this plan, the Executive concluded that the needs of our Association would be best met by utilizing the volunteer expertise that already exists among our members.

Context

Water from snowmelt or hard rains can generate overland flow which runs downhill, in our case, from west to east toward Georgian Bay. For the LRSA, water from as far away as west of the 9th Line of Meaford can flow towards our members' properties and has to cross under (or over) our private road to reach Georgian Bay. Ineffective drainage can make the road vulnerable to damage from freeze/thaw cycles which will encourage potholes, crumble the road's hardtop, and weaken the base of the road itself creating an uneven surface and ultimately increasing maintenance costs. The LRSA's existing drainage system developed as need arose and was expanded as more homes were built. While effective for many years, peak run-off volumes have been increasing, periodically overwhelming the LRSA's existing drainage system and threatening the long-term integrity of our private road.

There is currently no comprehensive or standardized system of culverts, ditches or tiles within the LRSA. For the purposes of this Drainage Plan and for future work, we are defining the drainage system as including four elements:

1. Roadside ditches, tiles and culverts, including those under driveways (typically on the west side of the road).

2. Under-road culverts that convey water from the west to the east side of the road.

3. Ditches, swales or culverts that convey the water from the road east to Georgian Bay.

4. The shape of the road itself (profile) that should encourage drainage off of the road's surface.

This Drainage Plan provides recommendations to improve our drainage system and to best protect our investment in Lakeshore Road South. The LRSA's Drainage Plan will be limited to recommendations concerning these four elements only. Water conveyance from private properties to the roadside ditches or culverts or swales is the responsibility of each property owner and is not considered to be part of this Drainage Plan.

Current Drainage Problems/Concerns

The following list of drainage problems and concerns has been created based on past road inspections as well as input from LRSA Executive Members and was the motivation for creation of this Drainage Plan:

1. Water ponding on road in front of Kearns (#190) and Ingoldsby (#184) due to depressions in the road's profile. (Low priority as this can only be solved by road re-grading during next resurfacing project).

2. Increase in water volumes flowing from the west at Flanakin's (#194) has caused ditch erosion and some concern that the under-road culvert is under-sized. (Medium priority- Stone has been added to control erosion. Culvert sizing is to be monitored).

3. Roadside ditches filling with sediment and vegetation over time (e.g., along Shute's property). (Low priority- clean out completed in 2022).

4. Concern that the roadside ditch at Clement's (#232)/ Mills (#234), the culvert under Mills' driveway, and the under-road culvert are under-sized and poorly designed to convey high flows. There have been recent instances of runoff over-topping of the road and impacting Sauriol's property (#233). (High priority).

5. General concern that future development along our road as well as to the west toward the 9th Line will increase peak flows and require the LRSA to upsize existing ditches and culverts. Climate change and the reality of more intense summer storms will also tax our system's current capacity.

6. There are several places along the length of our private road where the road surface has depressions or a flat profile meaning water ponds on the road or along the road's edge. This allows for freeze/thaw cycles to damage the road surface and road bed. (Low priority at present as this can only be solved with road re-grading during next resurfacing project).

LRSA's Existing Drainage "System"

The following is an inventory of our existing drainage infrastructure and is presented in geographic order along the road's length from south to north.

1. Under-road culvert at Rogers (near mailboxes). (This area is under review as it is currently managed by the municipality and not formally part of the LRSA). (14" dia., poor condition, partially crushed on inlet side).

2. Buried roadside perforated tile (french drain) from Kearns (#190) north to Flanakin's (#194). (Recent installation, 6" dia.).

3. Under road culvert at north edge of Kearns property (#190) (recent installation, unknown dia., inlet side repaired with stone to minimize erosion).

4. Under driveway culvert at Flanakin's (#194) (12" dia, new construction).

5. Under road culvert north of Flanakin's driveway (#194) (16" dia. good condition, recent erosion repair with rock to reduce erosion).

6. Under driveway culvert at Flanakin's (#194) (12" dia, new construction)

7. Under driveway culvert at Shute's (12" dia.)

8. Road-side ditch along Shute's property (2' deep, 5' wide, recently cleaned out).

9. Under road culvert at Bester's (#211). (36" dia., good condition. Note this is a regulated watercourse and requires Conservation Authority approval for any work or modifications).

10. Buried roadside perforated tile (french drain) from Rhodes (#214) north to Wilcox's (#217). (Installed 2018, 6" dia.).

11. Under road culvert from Davies (empty lots) to Pugsley/ Dean (#225). (16" dia., recent installation, good condition).

12. Outlet swale between Cash (#231) and Pugsley/ Dean (#225). (maintained as cut grass, high capacity).

13. Road side ditch from Clement's (#232) to Mills (#234) (16" deep by 36" wide, under-sized and a problem site).

14. Under driveway culvert at Mills (#234). (12", older, under-sized).

15. Under road culvert between Mills (#234) and Wilson (#??) (18"dia., new, good condition).

16. Outlet swale between Sauriel (#233) and Solomon (#237) (unmaintained- shrubs, trees and grasses, high capacity).

17. Road side ditch in front of Wilson's (#??) (16" deep by 36" wide).

18. Under driveway culvert at Wilson's (#??) (12" dia.).

LRSA Standards for Future Drainage Works

In an effort to develop standards and guidance for future drainage system repairs and upgrades, our system sizing was compared to the ditch and culvert sizing on Lakeshore Road North, which has been designed to meet municipal standards. Drainage conditions are similar between the two areas justifying their drainage system as a model for our future works. However, it is noted that our private road and the size of our Association is much smaller with far less traffic, lighter vehicle use, fewer properties, and all investments and repairs are 100% paid for by our membership rather than municipal property taxes. As such, LRSA drainage system recommendations are scaled down slightly to reflect our smaller size and funding.

Drainage System Sizing Comparison - LRSA vs Lakeshore Road North:

Drainage Component	LRSA	Lakeshore Road North	Recommended LRSA Drainage System Sizing
Road Side Ditches	16″X36″ 24″X60″	42″X72″	Recommend all future road-side ditches be constructed to 24″ deep X 60″ wide as a minimum (i.e., as in front of Shute's. If a buried culvert is proposed instead of an open ditch, a minimum 16″ dia. culvert will be required.
Roadside Buried Tile	4″ French Drains	None	Lakeshore Road North uses open ditches exclusively. The LRSA will retain the option of buried roadside tiles (French Drains) but recommends a minimum tile size of 6″ diameter.
Under Driveway Culverts	12″	18″	Recommend all future under-driveway culverts be 16″ diameter minimum.

Drainage Component	LRSA	Lakeshore Road North	Recommended LRSA Drainage System Sizing
Under Road Culverts	14″ 16″ 18″ 36″ (defined watercourse)	24″	Recommend all future under-road culverts be 22″ diameter minimum.

Drainage Plan Recommendations for Future Works:

Action	Details	Financial Responsibility
1. Construct ditches or buried culverts/ tile continuously along western edge of road.	As need, opportunity and funding arises, construct, based on need, open ditches (minimum of 24" deep by 60" wide), buried culverts (minimum 16" dia.) or infiltration trenches with perforated tile (minimum 6" diameter) on all properties fronting along the western edge of the road. Under driveway culverts must be a minimum 16" diameter. All ditches, culverts and tiles along the western side of the road are to outlet to an under-road culvert. All ditches, culverts and tiles are to be maintained in good working order. Property owners are responsible for any cosmetic maintenance at their own cost (e.g., grass cutting , weed removal) while the LRSA will be responsible for periodic ditch clean-outs to maintain functionality (e.g., sediment removal with a back-hoe, shrub and tree removal if it is impairing water flow).	New construction and required maintenance or replacement will be paid 100% by LRSA from member's dues.
2. Upgrade Under-Road Culverts to standard (larger) sizing to accommodate higher flows.	As need , opportunity and funding arises, ensure under-road culverts are replaced with a minimum diameter of 22".	To be paid 100% by LRSA from member's dues.
3. Maintain Swale Outlets to Georgian Bay	Two swales exist as part of the LRSA's Drainage System: 1) between Cash (#231) and Pugsley/ Dean (#225), and 2) between Solomon (#237) and Sauriol (#233). The first is maintained as manicured grass, the second has a cover of trees and shrubs. If water flow in either swale outlet becomes restricted for any reason, the LRSA will coordinate and pay for work to ensure these outlets continue to work effectively.	Maintenance to be paid 100% by LRSA from member's dues.

Action	Details	Financial Responsibility
4. As part of the next road resurfacing, ensure the existing road is pulverized and regraded with an appropriate profile to encourage runoff, and that no on-road depressions exist.	Tender specifications must include regrading and drainage requirements. Consult the Municipality of Meaford at that time for appropriate wording for the tender document.	To be paid 100% by LRSA from member's dues.

Funding

All costs listed above, except where noted otherwise, will be borne 100% by the LRSA via annual member dues. This approach mirrors municipal practice and recognizes that while projects may be property specific, the benefits extend to many if not all members of the LRSA.

NOTE: It is the responsibility of the individual property owner (including all costs) to design and install systems to convey water from their property to the road side ditch or tile.

Implementation

It will be the responsibility of the LRSA Executive to implement this Drainage Plan through annual work plans that reflect need and funding availability.