

# CULVERT

## GUIDELINES

ing. Ordre  
des ingénieurs  
du Québec



## WHAT IS A CULVERT?

A culvert is a bridge-like structure made up of one or more cross-section ducts that are covered with granular material. It allows a path to cross an obstacle such as a stream or a ditch.

Various types of risks must be taken into account when designing or modifying this type of structure.

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## RISK FACTORS AND THEIR POTENTIAL IMPACTS

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- Hydraulic: deficient drainage, water accumulation, overflow, erosion, flooding, sediment deposition, obstruction of fish passage, increased flow velocity.
- Structural: failure, collapse, damage to infrastructure (pavement, roads, road systems) and hazardous traffic areas for users, obstruction of normal water flow, risk of obstruction by bedload, woody debris or beaver activity.
- Economic: reduced service life, financial impacts for owners due to damage or premature replacement.

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## GENERAL RULE

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Culverts are subject to the Engineers Act whenever they meet one of the following criteria:

- They are dependencies of road works, i.e. they have a functional dependency on the road and allow it to perform its role;
- OR**
- They are structures that require studies on the properties of their materials.

When culverts meet either of these two criteria, the plans and specifications used to build, modify or authorize them must be signed and sealed by an engineer.

The plans and specifications required for culverts located in a (public or private) forest may be prepared by forest engineers. Forest engineers may also monitor and inspect these types of culverts.

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## STUDIES ON THE PROPERTIES OF MATERIALS

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When designing a culvert, studies on the properties of its materials are required if its load bearing capacity or its effect on the flow of water come into question. Generally speaking, culverts that do not pose any potential risk to public safety will not be considered subject to the Engineers Act. It is worth noting, however, that even if a culvert is not subject to the Act, there may still be potential risks. The person responsible for its design must take all risk factors into account.

**EXAMPLE 1:** A culvert that crosses under a municipal road is considered a dependency of road works. Furthermore, load-bearing calculations based on an analysis of material properties are required when designing this type of culvert. In this case, both criteria of the General Rule stated above apply, and the culvert is therefore clearly subject to the Act.

**EXAMPLE 2:** Conversely, a culvert in a curb cut for a private residence does not pose any major risk or involve any load carrying capacity issue. Furthermore, a private driveway is not a road work. Unless its effect on the flow of water is a factor requiring engineering calculations, such a culvert will not be subject to the Act.

### KEEP IN MIND:

Multiple municipal, provincial, and federal regulatory provisions may apply to the installation and maintenance of culverts. Being exempt from one law or regulation does not mean other laws and regulations do not apply. If a project includes a culvert, it is important to ensure that all applicable provisions are followed.

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## EXCEPTIONS

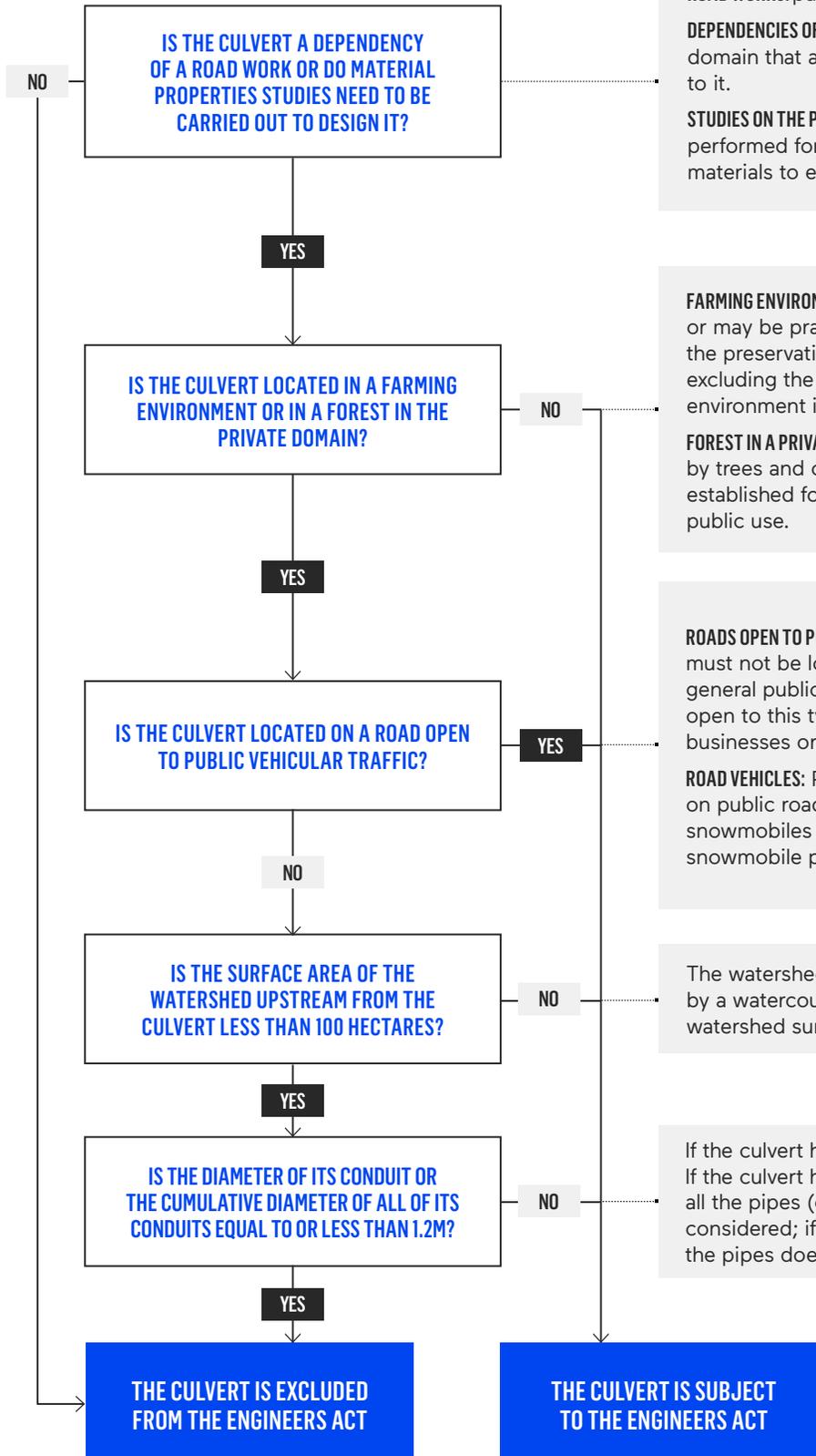
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- 1** Even if they meet one of the above mentioned criteria, certain culverts are excluded from the Engineers Act. In such cases, non-engineers may design the culverts, supervise related work, inspect them or carry out other related tasks. These exceptions are clarified in the diagram below.
- 2** An employee of a municipality may supervise repair work on a culvert that belongs to the municipality, provided no modifications are made to its original design.
- 3** Finally, the person responsible for enforcing municipal by-laws with respect to culverts may inspect the culvert and make recommendations to ensure compliance with these regulations within the scope of the powers granted to that person by the by-law in question.

# TO DETERMINE WHETHER A CULVERT IS SUBJECT TO THE ENGINEERS ACT, YOU NEED TO ASK THE FOLLOWING QUESTIONS:

## QUESTIONS:

## ADDITIONAL INFORMATION:



**ROAD WORKS:** public or private roads connected to the road network.  
**DEPENDENCIES OF ROAD WORK:** works located within the public road domain that are functionally dependent on the road or accessory to it.  
**STUDIES ON THE PROPERTIES OF MATERIALS:** yes, if calculations have to be performed for the sizing, load bearing capacity, and choice of materials to ensure a safe structural design.

**FARMING ENVIRONMENT:** any area where agricultural activities are or may be practised within the meaning of the Act respecting the preservation of agricultural land and agricultural activities, excluding the urbanization perimeter of a municipality. A farming environment is not limited to the lands owned by a farmer.  
**FOREST IN A PRIVATE DOMAIN:** any land that is covered extensively by trees and owned by a natural person or a legal person established for a private interest or that is not assigned to public use.

**ROADS OPEN TO PUBLIC VEHICULAR TRAFFIC:** To be excluded, the culvert must not be located on a (public or private) road on which the general public is allowed to travel, such as a street. Other lands open to this type of traffic include access roads to stores and businesses or the parking lots of shopping centres.  
**ROAD VEHICLES:** Road vehicles are vehicles authorized to travel on public roads. They do not include off-road vehicles such as snowmobiles or 4-wheelers. Therefore, a culvert located on a snowmobile path may be excluded.

The watershed upstream from the entire territory drained by a watercourse or a drainage ditch. The calculation of the watershed surface area is not an activity reserved for engineers.

If the culvert has just one pipe, use the diameter of the pipe. If the culvert has several pipes, use the cumulative width of all the pipes (only the diameter of the pipes needs to be considered; if the pipes are not adjoining, the space between the pipes does not count).

# WE THANK THE FOLLOWING ASSOCIATIONS FOR THEIR PARTICIPATION IN THE PREPARATION OF THIS DOCUMENT



**ADMQ** | Association des  
directeurs municipaux  
du Québec



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