Culvert Replacement Exemption Requirements

A culvert replaced in the same location is exempt from needing a DNR waterway permit if the project meets all of the requirements below. Many of these requirements follow best management practices to protect water quality. Statute and code references for this activity are ch. 30.123 (6) (b), Wis. Stats., and s. NR 320.04 (10), Wis. Adm. Code. If your project meets the requirements below, you do not need to contact DNR and you may proceed with your project, in accordance with all other necessary federal, state, and local permits or approvals.

Culvert Location and Design Requirements

1. ☐ The replacement culvert shall be placed in substantially the same location as the culvert being replaced and may not have a lesser cross-sectional area than the existing culvert.
2. ☐ The structure is NOT located in an area of special natural resource interest as defined in s. 30.01 (1am), Stats., or a public rights feature under s. NR 1.06.
3. ☐ Individual waterway crossings consisting of a multiple-culvert design are not eligible under this exemption unless a waiver to this standard has been obtained through a voluntary exemption determination request under s. NR 300.04 (4). To submit a request, submit the information listed below in a voluntary exemption review request to the DNR Waterways General Question inbox. The DNR will make a determination within 15 days of receiving a complete request.
    - A statement that describes the proposed activity.
    - The site location.
    - The construction timing and methods that will be used.
    - The project scope and design.
    - A demonstration that the proposed activity will not cause a material injury to the riparian rights of any riparian owners.
4. ☐ The replacement culvert shall be adequately sized to protect stream hydrologic

function and aquatic organism passage. Adequate culvert size may be determined through any of the following methods:

a. Using the culvert sizing methods below for culvert area calculated to be 20 square feet or less (see Appendix A for culvert sizing calculator instructions).
b. The placement of a single culvert sized to completely span bankfull width at a location that is representative of the stream width through the reach in question.
c. Duplicating the design or sizing of a downstream crossing that has been designed, constructed, or placed by the WI Department of Transportation or a municipality and that meets the performance objectives stated in subd. 4.

5. ☐ The replacement culvert shall be designed to mimic the natural streambed, stream channel, and stream gradient. The inverts of the replacement culvert shall be installed to sit below the natural streambed, which allows for deposition of natural materials. Water depths, widths, and velocities at the inlet and outlet shall match the natural stream channel under most flow conditions. Perched culverts are not in compliance with the conditions under this subdivision.

   Note: The Great Lakes stream crossing inventory may be used to identify locations of existing crossings that have been observed to cause ecological problems requiring attention at the time of replacement and can be viewed at https://dnr.wisconsin.gov/, keyword “Great Lakes stream crossing inventory.”

6. ☐ The replacement culvert shall not substantially disrupt aquatic species movements necessary to carry out life cycle functions. Perched culverts are not in compliance with the condition under this subdivision.
7. ☐ The replacement culvert shall be installed at least one foot beyond the road fill.

Culvert Installation Requirements

1. ☐ Any grading, excavation, and land disturbance shall be confined to the minimum area necessary for construction.
2. ☐ A one-time deposit of sand, gravel, or stone under may be associated with the placement of a structure provided the deposit is limited to the area immediately underneath or adjacent to the structure and is less than 2 cubic yards.
3. ☐ Dredging is allowable up to the amount necessary to place a structure or crossing.
4. ☐ Operating construction equipment on the bed of the stream or below the ordinary high-water mark is prohibited.
5. ☐ All fill material shall consist of clean suitable soil material, as defined under s. NR 500.03 (214), free from hazardous substances, as defined by s. 289.01 (11), Stats., and free from solid waste as defined under s. 289.01 (11) and (33), Stats.
6. ☐ Construction shall be accomplished in such a manner as to minimize erosion and siltation into surface waters and wetlands. All erosion control measures shall meet or exceed technical standards under subch. III of ch. NR 151, Wis. Adm. Code. Any area where topsoil is exposed during the project shall be immediately seeded and mulched to stabilize disturbed areas and prevent soils from being eroded and washed into the waterway.

   Note: Land disturbance and vegetation removal should be kept to the minimum area necessary to implement the project. Such disturbance may be regulated through local shoreland zoning regulations or under s. 30.19, Stats.

8. ☐ Vegetation, material, soil stockpiles, or equipment shall not be stored in wetlands unless authorized through applicable wetland exemptions or permits available under s. 281.36, Stats.
9. ☐ Unless the waterway is dry for the duration of the construction activities, coffer dams shall be installed upstream and downstream of the project area and in

conjunction with a method to maintain downstream flow.

10. ☐ Coffer dams and temporary diversion channels shall be constructed using non-erodible material and secured with rock or rock-bags at the bottom of the channel and top of the banks. Earthen coffer dams are not allowed.
11. ☐ Coffer dams shall be removed in such a way that minimizes the release of sediment and other downstream impacts, typically by removing the downstream coffer dam first then slowly removing the upstream coffer dam. Upon completion of culvert placement and stabilization, a bypass channel shall be restored to its original condition.
12. ☐ Pump intakes and discharges shall prevent impacts to fish and wildlife habitat and shall be placed to prevent the disturbance, removal, or scour of bed material.
13. ☐ Temporary bypass structures used to maintain streamflow, including diversion channels, pump bypass systems, or diverting to one culvert at a time, need to be adequately sized to prevent damage from upstream flooding and downstream siltation, wash-out, or scouring.
14. ☐ Clean fill material shall be firmly compacted around the culvert, including coverage around the top of the culvert to at least one-third of the culvert diameter, or to a depth of 12 inches, whichever is greater.
15. ☐ Geotextile fabric or a coarse-grained filter bedding shall be placed and covered with clean riprap 6 to 24 inches in diameter around the culvert inlet and outlet.
16. ☐ All project equipment shall be decontaminated for removal of invasive species prior to and after each use on the project site by following the most recent department approved washing and disinfection protocols per ch. NR 40.

    Note: Current protocols can be found on the department website at https://dnr.wisconsin.gov, keyword “invasives disinfection.”
17. ☐ Obstructions in the culvert such as accumulated brush, debris, or other obstructions shall be removed to prevent environmental impacts, such as

exacerbated flooding or culvert failure.

Note: A city, village, town, or county must keep records of culverts replaced pursuant to this exemption in accordance with s. 30.123 (9), Stats.

Timing Requirements

1. ☐ Construction activities below the ordinary high-water mark of a waterway shall be continuous to the greatest extent practicable until the work is completed, and the site is stabilized. If periods of inactivity are unavoidable, the site shall be temporarily stabilized until the work is resumed and completed.
2. ☐ Excepting emergencies which constitute a threat to life, safety, or property, construction shall not take place during periods of high water to avoid flooding the construction site.
3. ☐ To minimize adverse impacts on fish movement, fish spawning, and egg incubation periods, in-water work may not occur during any of the following time periods unless timing restrictions have been waived by the department:
    a. September 15th through May 15th for all trout streams identified on DNR published maps. (See DNR trout stream maps at https://dnr.wisconsin.gov, keyword “trout stream maps.”)
    b. September 15th through June 15th on all Great Lakes tributaries upstream to the first dam or barrier.
    c. November 1st through June 15th for Lake Michigan waters surrounding Door County, including Green Bay and all harbors and bays.
    d. September 15th through July 1st for Lake Superior waters surrounding Douglas County, including St. Louis River and all harbors and bays.
    e. March 1st through June 15th for all other waters.

    Note: To request a waiver for some or all of the fish timing restrictions submit the information listed below in a voluntary exemption review request to the DNR Waterways General Question inbox. The DNR will

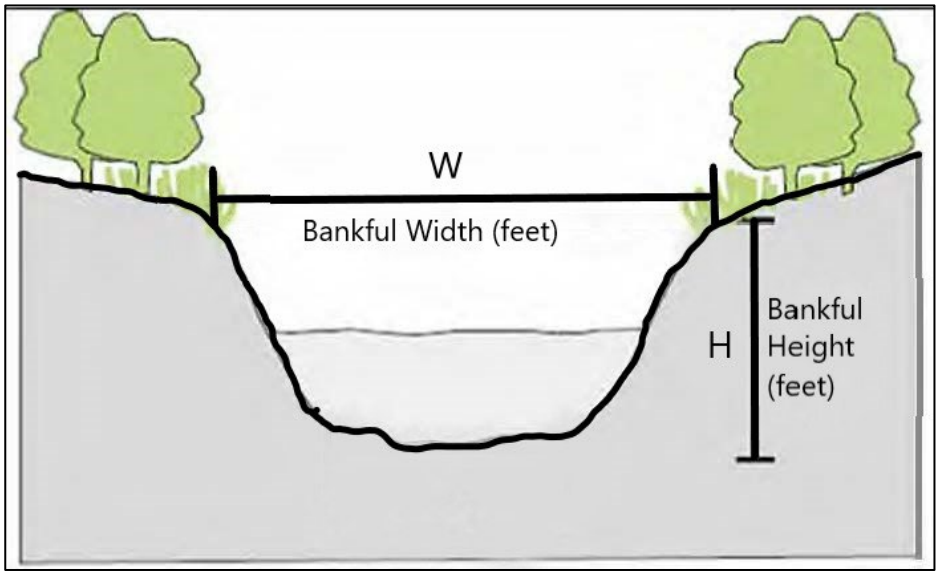
make a determination within 15 days.

- A statement that describes the proposed activity.
- The site location.
- The construction timing and methods that will be used.
- The project scope and design.
- A demonstration that the proposed activity will not cause a material injury to the riparian rights of any riparian owners.

Appendix A

Calculate Required Culvert Area

To be eligible for a general permit without a professionally engineered culvert design, the required culvert area may be up to 20 square feet. To be eligible for a general permit with a professionally engineered culvert design, the required culvert area may be up to 40 square feet.



To determine the required culvert area, measurements shall be made of the channel width of the stream in feet at the bankfull width (W), and the maximum bankfull height in feet above the stream bottom (H) (see diagram). These measurements shall be made at each of 3 locations or transects along the stream: the location of the newly proposed culvert crossing; 100 feet upstream from the crossing; and 100 feet downstream from the crossing. Where there is an existing crossing being replaced, measurements at the site of the crossing may not be representative due to impacts related to the existing crossing. In such instances two measurements shall be taken, upstream and downstream of the crossing location. Measurements shall be taken to ensure that the locations where measurements are made are representative of the stream overall. The individual measurements of W and H shall be averaged to derive the final W and H values. The required culvert area is then

calculated with the following equation:

Required Culvert area (square feet) = H x W

To find the area of any round culvert, use the following equation:

Round Culvert Area (square feet) = R x R x 3.14

R (radius in feet) = Culvert diameter (inches) / 24

*Example culvert area required for a stream with a culvert area calculation (H*W) of 8.5 square feet:

8.5 square feet = R x R x 3.14
2.7 square feet = R x R
1.6 feet = R
R = 19.7 inches
Culvert diameter =39.4 inches
Culvert size = 42 inches

Round culvert diameters and corresponding culvert area	
Culvert diameter (inches)	Culvert area (square feet)
18	1.80
24	3.10
30	4.90
36	7.10
42	9.60
48	12.60
54	15.90
60	19.60
66	23.80

Pipe arch culvert diameters and corresponding culvert area		
Pipe width or span (inches)	Pipe height or rise (inches)	Culvert area (square feet)
43	27	6.4
50	31	8.7
58	36	11.4
65	40	14.3
72	44	17.6
73	55	22.0
85	54	25.3
81	59	26
87	63	31
95	67	35
103	71	40

Calculate Required Culvert Length

To determine the length of any culvert, use the following equation:

Length of Culvert (L) = W + 4H + 2

W = Width of road top

H = Height of culvert + average depth of road fill

H is multiplied by 4 as a constant for the side slope angle (2 x 2:1)

2 is added as a constant for 1 foot of pipe extension beyond fill

Example culvert length calculation.

Length of culvert needed for 10’ road top, 24” (2”) diameter pipe, 1’ average road fill depth, 2:1 side slopes, 1’ pipe extension beyond fill:

L = 10’ road top + 4(2’ culvert + 1’ fill) + 2’ extension

L = 10 + 4(2+1) + 2

L = 10 + 4x2 + 4x1 + 2

L = 10 + 8 +4 + 2

L = 24 feet

