

DEPARTMENT OF AGRICULTURE, CONSERVATION AND FORESTRY  
MAINE LAND USE PLANNING COMMISSION

CHAPTER 10, LAND USE DISTRICTS AND STANDARDS

**Adopted Rule Revisions: Roads and Water Crossings**

*May 8, 2019*

*The following revisions represent amendments to Chapter 10, Land Use Districts and Standards for Areas Within the Service Area of the Maine Land Use Planning Commission. This document only includes the relevant section of Chapter 10. The revisions repeal and replace the existing rule language for Section 10.27,D in its entirety. Therefore, the revisions are not shown in strikeout and underline format.*

*Where necessary, explanations of some changes have been included in [brackets]. These explanatory notes would not be included in the final rule.*

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## 10.27 ACTIVITY-SPECIFIC STANDARDS

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### D. ROADS AND WATER CROSSINGS

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Roads and water crossings not in conformance with the standards of Section 10.27,D may be allowed upon issuance of a permit from the Commission provided that such types of activities are allowed in the subdistrict involved. An applicant for such a permit shall show by a preponderance of the evidence that the proposed activity, which is not in conformance with the standards of Section 10.27,D, will be conducted in a manner that produces no undue adverse impact upon the resources and uses in the area.

The following standards apply to roads and water crossings for any purpose other than land management roads and water crossings on/for land management roads where those uses are regulated by the Maine Forest Service; repair and maintenance of legally existing road culverts or replacement of legally existing road culverts in accordance with 12 M.R.S. §685-B(1-A)(A); and driveways associated with residential structures and uses, except as provided in Section 10.27,H.

*[The Section 10.27,H standards require that water crossings for driveways meet Section 10.27,D,2, below]*

1. **Roads, Drainage Ditches, and Turnouts.** The following standards apply to construction and maintenance of roads, including the creation of drainage ditches and turnouts:
  - a. Sediment barriers, such as silt fences or erosion control mix berms, must be properly installed between areas of soil disturbance and downgradient non-tidal waterbodies and wetlands prior to construction. Sediment barriers must be maintained until the disturbed area is permanently stabilized, and removed within 30 days, or as soon as practicable, following final stabilization of the site;
  - b. Prior to any forecasted storm event and within 7 days following the completion of construction, all cut or fill slopes and areas of exposed mineral soil outside the road surface must be seeded and mulched, or otherwise stabilized to prevent unreasonable soil erosion and sedimentation of non-tidal water bodies or wetlands;
  - c. Road side slopes must have a slope no steeper than 2 horizontal to 1 vertical;
  - d. All drainage ditches created as part of the project must be properly stabilized upon completion to prevent unreasonable soil erosion;
  - e. Roads, drainage ditches, and turnouts must be located, constructed, and maintained to provide an undisturbed filter strip, of at least the width indicated below, between any exposed mineral soil and the normal high water mark of a non-tidal water body or upland edge of a wetland located in a P-WL1 subdistrict:

<b>Average Slope of Land Between Exposed Mineral Soil and Normal High Water Mark (Percent)</b>	<b>Width of Filter Strip Between Exposed Mineral Soil and Normal High Water Mark (Feet Along Surface of the Ground)</b>
0-10	25
11-20	45
21-30	65
31-40	85
41-50	105
51-60	125
61-70	145
71-100	165

Table 10.27,D-1. Filter strip width requirements for roads, drainage ditches, and turnouts.

These filter strip requirements do not apply to road surfaces for approaches to water crossings or wetlands.

- f. Drainage ditches may not extend to the resource being crossed. Drainage ditches for roads approaching a water crossing or wetland must be designed, constructed, and maintained to empty into an undisturbed filter strip, of at least the width indicated in the table set forth in Section 10.27,D,1,e above. Where such filter strip is impracticable, appropriate techniques must be used to avoid unreasonable sedimentation of non-tidal water bodies and wetlands. Such techniques may include the installation of plunge pools or settling basins, or the effective use of additional ditch relief culverts and ditch water turnouts placed so as to reasonably avoid sedimentation of the water body or wetland;
- g. Ditch relief (cross drainage) culverts, stone-lined drainage dips, water turnouts, and other best management practices must be installed, where necessary, to disperse the volume or velocity of water in drainage ditches into undisturbed filter strips to prevent ditch erosion.
  - (1) Stone-lined drainage dips may be used in place of ditch relief culverts only where the road grade has a sustained slope of 10% or less;
  - (2) On roads having sustained slopes greater than 10%, ditch relief culverts must be placed across the road at an angle of approximately thirty-degrees downslope from a line perpendicular to the center line of the road;
  - (3) Ditch relief culverts, stone-lined drainage dips, and water turnouts must direct drainage into undisturbed filter strips as required in Sections 10.27,D,1,e and f above;
  - (4) Ditch relief culverts must be sufficiently sized and properly installed to allow for effective functioning, and their inlet and outlet ends must be stabilized with appropriate materials; and
  - (5) Ditch relief culverts, stone-lined drainage dips, and water turnouts must be spaced along the road at intervals no greater than indicated in the following table:

Road Grade (Percent)	Spacing (Feet)
0-2	500-300
3-5	250-180
6-10	167-140
11-15	136-127
16-20	125-120
21+	100

Table 10.27,D-2. Spacing requirements for ditch relief culverts, drainage dips, and water turnouts.

- h. Ditches, culverts, bridges, dips, water turnouts and other water control installations associated with roads must be maintained on a regular basis to assure effective functioning.
- i. Maintenance of the above required water control installations must continue until the road is discontinued and put to bed by taking the following actions:
  - (1) All culverts, open-bottom arches, and bridges must be dismantled and removed in a fashion to reasonably avoid sedimentation of non-tidal water bodies and wetlands. Stream banks must be restored to original conditions to the fullest extent practicable, and disturbed soils must be stabilized to prevent soil erosion.

- (2) Water bars must:

- (a) Be constructed across the road at intervals established below:

Road Grade (Percent)	Distance Between Water Bars (Feet)
0-2	250
3-5	200-135
6-10	100-80
11-15	80-60
16-20	60-45
21+	40

Table 10.27,D-3. Spacing requirements for water bars.

- (b) Be constructed at an angle of approximately thirty-degrees downslope from the line perpendicular to the center line of the road;
  - (c) Be constructed so as to reasonably avoid surface water flowing over or under the water bar; and
  - (d) Extend sufficient distance beyond the traveled way so that water does not reenter the road surface.
- j. Extension, enlargement or resumption of use of presently existing roads, which are not in conformity with the provisions of Section 10.27,D, are subject to the provisions of Section 10.11.
2. **Water Crossings of Flowing Waters.** Except as provided in Section 10.27,D,2,d,(17) for trail crossings, the following standards apply to crossings of flowing waters:
- a. **All Crossings.** All crossings must be installed, and, in the case of temporary crossings, removed during low-flow conditions between July 15 and September 30 in any calendar

year, unless the notice submitted pursuant to Section 10.27,D,5 includes written approval from the Maine Department of Inland Fisheries and Wildlife for an alternative time period.

**b. Temporary Crossings.** Temporary crossings may be used for equipment access across flowing waters. Temporary crossings must:

- (1) Be removed within 180 days;
- (2) Not use soil materials for construction or stabilization;
- (3) Unless constructed in a way that spans the stream channel, with no disturbance to the streambed or banks, involve a culvert installation that meets all the following standards:
  - (a) Placed on geotextile fabric or other equally effective material where practicable to ensure restoration to the original grade,
  - (b) Covered with rock large enough in size to allow for easy removal without disturbing the streambed,
  - (c) Designed and maintained to withstand and pass high flows, such that water height is no higher than the top of the culvert's inlet, a minimum culvert diameter of 24 inches is required to pass debris, and
  - (d) Aligned to prevent bank erosion or streambed scour; and
- (4) Removed upon completion of the work. Impacts to the streambed or bank must be restored to original condition to the fullest extent practicable.

*[Consistent with Army Corps standards for temporary crossings.]*

**c. Permanent Crossings.**

- (1) To the greatest extent practicable, work in the stream must be minimized, and design and construction must allow the stream's natural structure and integrity to remain intact.
- (2) If a stream to be crossed is a perennial watercourse and has a sustained slope of more than 2%, a bridge or open-bottom arch must be used to maintain the natural streambed.
- (3) If a perennial stream to be crossed is used for navigation, the crossing must consist of a bridge span or open-bottom arch with at least 4 feet of clearance during normal high water for boat passage.
- (4) Except as provided in Section 10.27,D,2,d,(5) and Section 10.27,D,2,d,(8),(c), bridges, open-bottom arches, and culverts must be installed and maintained to provide an opening sufficient in size and structure to accommodate flow from a 25-year frequency storm event, or with a cross-sectional area at least equal to 3 times the cross-sectional area of the flowing water.
- (5) Bridges, open-bottom arches, and culverts located in special flood hazard areas must be designed and constructed to provide an opening sufficient in size and structure to accommodate flow from a 100-year frequency storm event.

- (6) Footings and abutments for bridges and open-bottom arches must be landward of 1.2 times the width of the channel at normal high water.
- (7) Culverts utilized in permanent crossings must:
  - (a) Not exceed 75 feet in length;
  - (b) Follow the alignment and grade of the existing stream channel where possible. On perennial streams, the culvert's gradient may not exceed 2%;
  - (c) Have the bottom of the entire culvert installed below the streambed elevation, as follows:
    - (i)  $\geq 2$  feet for box culverts and other culverts with smooth internal walls,
    - (ii)  $\geq 1$  foot for corrugated pipe arches, and
    - (iii)  $\geq 1$  foot and at least 25% of the culvert diameter for corrugated round pipe culverts;
  - (d) Have diameters that exceed 1.2 times the width of the channel at normal high water;
  - (e) Be seated on firm ground, or on geotextiles used to stabilize the ground;
  - (f) Have soil compacted up the side of the culvert;
  - (g) Be covered by soil to a minimum depth of 1 foot or according to the culvert manufacturer's specifications; and
  - (h) Have the inlet and outlet ends stabilized by rip-rap or other suitable means to reasonably avoid erosion of material around the culvert.
- (8) Provided they are properly applied and used for circumstances for which they are designed, methods including but not limited to the following are acceptable to the Commission as means of calculating 25-year and 100-year frequency storm events and thereby determining crossing sizes as required in Section 10.27,D,2:
  - (a) The USDA Natural Resources Conservation Service (NRCS) Method: "Urban Hydrology for Small Watersheds." (Technical Release #55). USDA Soil Conservation Service (June 1986).
  - (b) The USDA NRCS Method: "TR-20 – Computer Program for Project Formulation – Hydrology," Second Edition, U.S. Department of Agriculture, Soil Conservation Service (March 1986).
  - (c) Provided that the only design storm used for sizing the crossing is a 100-year frequency storm event, the Commission may also allow use of the United States Geological Survey (USGS) method: StreamStats, a Web-based Geographic Information Systems application (Geological Survey, U. S. (2019, April 19). *USGS*. Retrieved from StreamStats: <https://streamstats.usgs.gov/ss/>).
- (9) Except as provided in Section 10.27,D,2,d,(10), water crossings must have natural bottom substrate placed within the structure matching the characteristics of the substrate in the natural channel at the time of construction and over time as the

structure has had the opportunity to pass significant flood events. To allow terrestrial passage for wildlife and prevent undermining of footings, crossings must have a bank on both sides of the stream matching the horizontal profile of the natural stream banks.

- (10) Installation of substrate material in culverts with diameters (round pipes) or rises (pipe arches or box culverts) of less than 60 inches may not be safe or practicable. In those cases, natural deposition and bed development is allowed.
- (11) Wheeled or tracked equipment may not operate in the water. Equipment operating on shore may, where necessary, reach into the water with a bucket or similar extension. Equipment may cross streams on rock, gravel or ledge bottom.
- (12) If work is performed in a flowing water that is less than 3 feet deep at the time of the activity and at the location of the activity, the applicant must provide for temporary diversion of flow to the opposite side of the channel while work is in progress.
  - (a) Diversion may be accomplished by placing sandbags, timbers, sheet steel, concrete blocks, at least 6 mil polyethylene, or geotextiles from the bank to midstream on the upstream side of the activity. No more than two-thirds or 25 feet of stream width, whichever is less, may be diverted at one time.
  - (b) Any material used to divert water flow must be completely removed upon completion of the activity, and the stream substrate must be restored to its original condition.
  - (c) A pump may be operated where necessary, for a temporary diversion. The pump outlet must be located and operated such that erosion or the discharge of sediment to non-tidal waterbodies or wetlands is prevented.
- (13) All wheeled or tracked equipment that must travel or work in a vegetated wetland area must travel and work on mats or platforms in order to protect wetland vegetation.
- (14) All excavated material must be stockpiled either outside the wetland or on mats or platforms. Sediment control barriers must be used, where necessary, to prevent sedimentation.
- (15) The use of untreated lumber is preferred. Lumber pressure treated with chromated copper arsenate (CCA) may be used only if necessary, only if use is allowed under federal law and not prohibited from sale under 38 M.R.S.A. §1682, and provided it is cured on dry land in a way that exposes all surfaces to the air for a period of at least 21 days prior to construction. Wood treated with creosote or pentachlorophenol may not be used where it will contact water.
- (16) Water crossings must be maintained to facilitate passage of aquatic life. Culverts that develop “hanging” inlets or outlets, bed washout, or a stream channel that does not match the characteristics of the natural stream channel, such as substrate mobility and type, and channel slope, stability, and confinement must be repaired as necessary to provide for natural channel characteristics and ensure adequate passage of aquatic life.
- (17) Except that Section 10.27,D,4 below always applies, trail crossings of minor flowing waters are exempt from the standards of Section 10.27,D, provided such crossings

are constructed in a manner that causes no disturbance to the streambed, and no substantial disturbance to the banks or shoreland areas in the vicinity of the crossing, and provided such crossings do not impede the flow of water or the passage of fish. If properly undertaken, acceptable methods may include, but not be limited to the laying of logs from bank to bank, or placement of bed logs and stringers with decking. This exemption does not extend to the construction of abutments or piers.

Trail crossings not so exempted are subject to the water crossing standards of Section 10.27,D.

*[Most proposed revisions are consistent with DEP's PBR standards except standards relating to crossing width and natural substrate in the crossing, which are consistent with Army Corps standards for crossings.]*

3. **Wetland Crossings.** The design and construction of roads, other than those located in areas below the normal high-water mark of standing or flowing waters, must avoid wetlands unless there are no reasonable alternatives, and must maintain the existing hydrology of wetlands.

To maintain the existing hydrology of wetlands, road drainage designs must provide cross drainage of the water on the surface and in the top 12 inches of soil in wetlands during both flooded and low water conditions so as to neither create permanent changes in wetland water levels nor alter wetland drainage patterns. This must be accomplished through the incorporation of culverts or porous layers at appropriate levels in the road fill to pass water at its normal level through the road corridor. Where culverts or other cross-drainage structures are not used, all fills must consist of free draining granular material.

To accomplish the above, the following requirements apply:

- a. **Wetland crossings on mineral soils or those with surface organic layers up to 4 feet in thickness.**
- (1) Fill may be placed directly on the organic surface compressing or displacing the organic material until equilibrium is reached. With this method, culverts or other cross-drainage structures are used instead of porous layers to move surface and subsurface flows through the road fill material.
    - (a) For road construction on mineral soils or those with surface organic layers less than 16 inches in thickness, culverts or other cross-drainage structures must be appropriately sized and placed at each end of each wetland crossing and at the lowest elevation on the road centerline with additional culverts at intermediate low points as necessary to provide adequate cross drainage. Culverts or other cross-drainage structures must be placed at maximum intervals of 100 feet.
    - (b) For road construction on surface organic layers in excess of 16 inches but less than 4 feet in thickness, cross drainage must be provided by placing culverts at each end of each wetland crossing and at the lowest elevation on the road centerline with additional culverts at intermediate low points as necessary to provide adequate cross drainage. Culverts or other cross-drainage structures must be placed at maximum intervals of 100 feet. Culverts must be a minimum of 18 inches in diameter, or the functional equivalent, and have the bottom embedded at least 6 inches below the soil surface of the wetland.
    - (c) Where necessary to maintain existing water flows and levels in wetlands, ditches parallel to the road centerline must be constructed along the toe of the

fill to collect surface and subsurface water, carry it through the culvert(s) and redistribute it on the other side. Unditched breaks must be left midway between culverts to prevent channelization.

- (2) Alternatively, a porous layer may be created to move surface and subsurface flows through the road fill materials. If a porous layer is used, geotextile fabric must be placed above and below fill material to increase the bearing strength of the road and to preserve the bearing strength of fill material by preventing contamination with fine soil particles.

**b. Wetland crossings on soils with organic layers in excess of 4 feet in thickness.**

- (1) Such construction must only take place under frozen ground conditions.
- (2) Geotextile fabric must be placed directly on the soil surface. Road fill or log corduroy must then be placed on the geotextile fabric.
- (3) Cross drainage must be provided by either a continuous porous layer, or appropriate placement of culverts or other cross-drainage structures and ditching as specified below:
  - (a) A continuous porous layer or layers must be constructed by placement of one or more layers of wood corduroy, large stone, or chunkwood separated from adjacent fill layers by geotextile fabric placed above and below the porous layer(s) such that continuous cross drainage is provided in the top 12 inches of the organic layer; or
  - (b) Cross drainage culverts or other cross-drainage structures must be placed at points where they will receive the greatest support. Culverts or other cross-drainage structures must be a minimum of 18 inches in diameter, or the functional equivalent, and have the bottom embedded at least 6 inches below the soil surface of the wetland. Where necessary to maintain existing water flows and levels in wetlands, ditches parallel to the roadbed on both sides must be used to collect surface and subsurface water, carry it through the culvert(s), and redistribute it on the other side. Such ditches must be located three times the depth of the organic layer from the edge of the road fill. Unditched breaks must be left midway between culverts to prevent channelization.

**4. Erosion and Sedimentation Control.** In addition to the foregoing minimum requirements, provision must otherwise be made in the construction and maintenance of roads and water crossings in order to reasonably avoid sedimentation of non-tidal water bodies and wetlands.

**5. Written Notice Required.** Written notice of all road and water crossing construction activities, except level A road projects and exempt trail crossings as provided in Section 10.27,D,2,d,(17) above, must be given to the Commission prior to the commencement of such activities. Such notice must conform to the requirements of Section 10.16 and must state the manner in which the water crossing size requirements of Section 10.27,D will be satisfied.