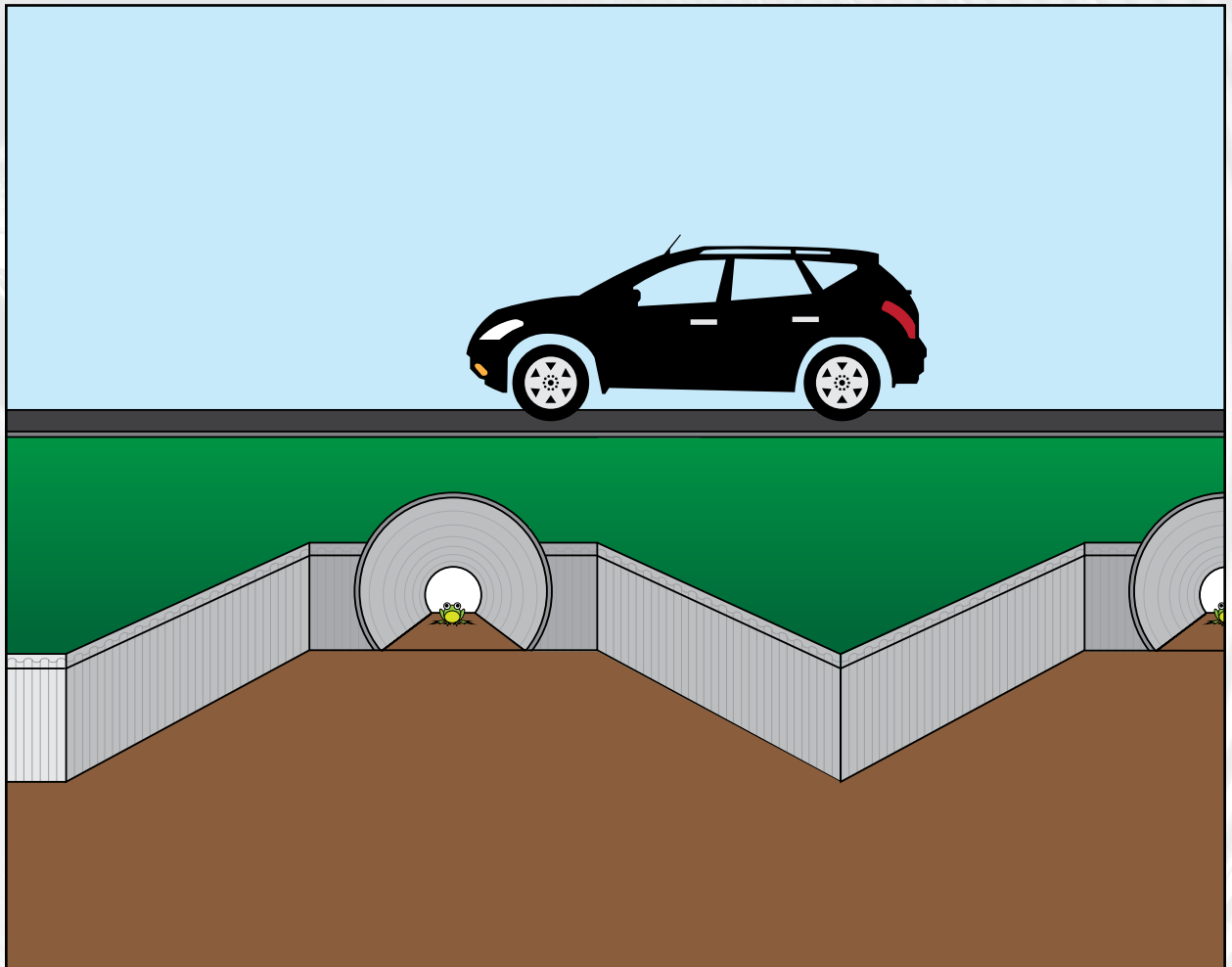


Taking Road Kill Out of the Cycle of Life Equation

The “Near Perfect Herpetofauna Eco-Passage”

Every year countless reptiles and amphibians (herps) fail to make it across the road to complete necessary phases in their cycle of life. Roads, railroads and pipelines can represent insurmountable barriers for them. An Eco-Passage that allows them to pass safely, with no knowledge of the barrier might be described as near perfect.

Corrugated Steel Pipe (CSP) culverts have a long history in crossing the road and although primarily constructed for economical highway drainage they naturally serve as eco-passages for a variety of species. Using a more focused design this function can be greatly enhanced. Features of a “Near Perfect Herpetofauna Eco-Passage” are described below.



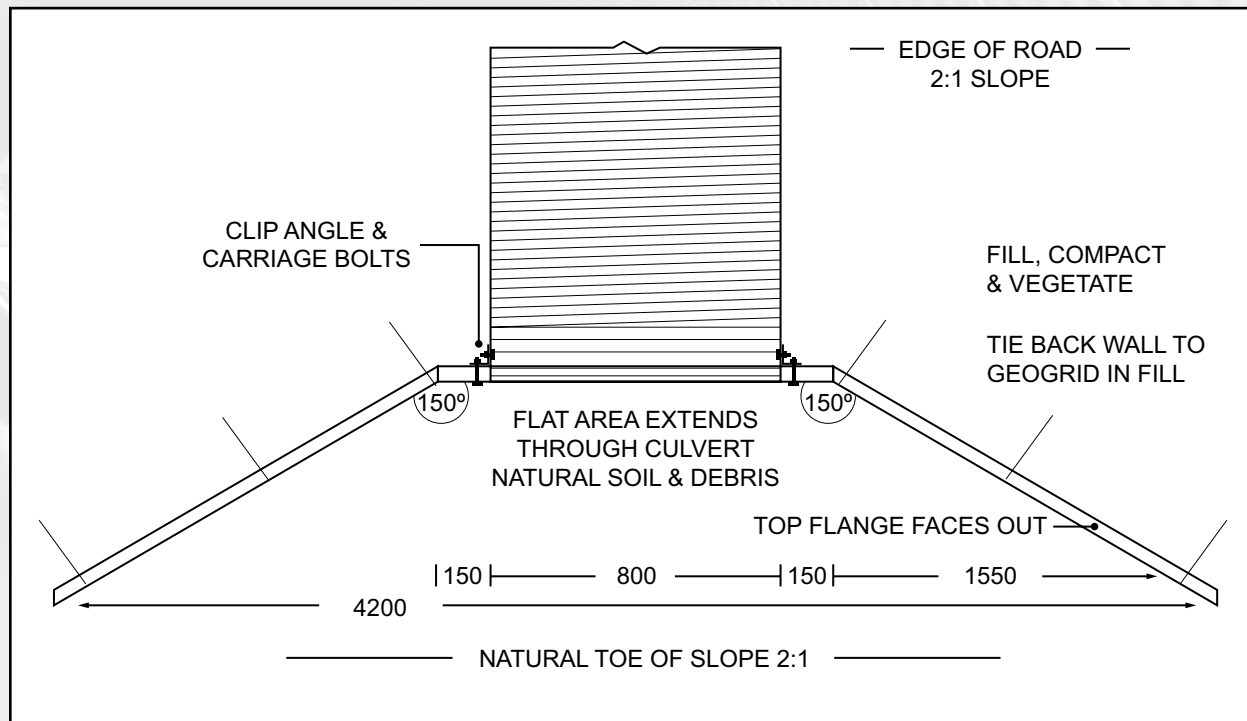
FROGWALL ECO-PASSAGE

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Sized at 800mm Diameter

CSP of this size, set a minimum of 300 mm below the road service is engineered to safely carry all highway and railway vehicle loading. It is an approved standard size that some highway departments set as a minimum for cross culverts as it allows for regular inspection and maintenance. At this size a 150mm deep x 600mm wide infill (herp crawlway) of natural soils and debris can be placed and maintained. Near vertical culvert sides have been identified as desirable in European studies and the 650mm roof height exceeds the maximum 500mm jump height of the pace setter, the Ranid or true frog. Integral vertical headwalls guide the herps and make it possible to shorten the crossing. This pipe size and shorter length allows for the entry of natural light, ventilation and temperature moderation inside the crossing.



PLAN VIEW FROGWALL ECO-PASSAGE

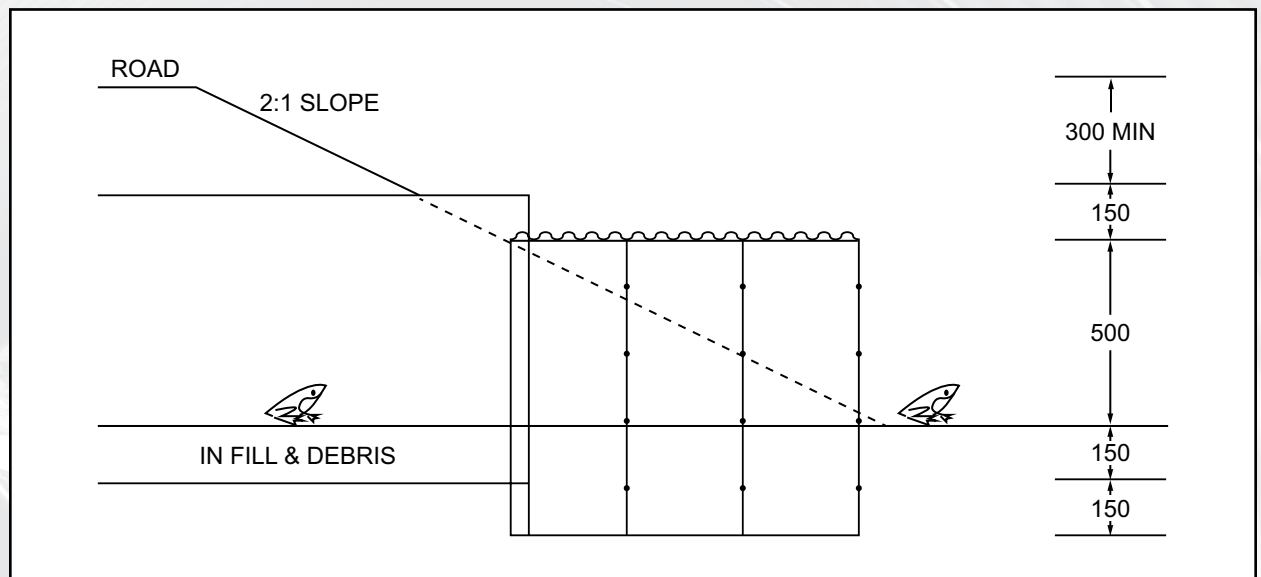
Headwall and Wing Walls

Constructed of standard steel sheets and fasteners for bolted CSP the headwall attaches to the CSP with bolted clip angles. Visible wall height is 500mm to match frog jump height with 300mm set below grade for wall stability and to prevent burrowing and hydraulic undercutting. Sides are pre-bent at 150 degrees with some flexibility for attachment of wing walls. Wing walls stay within the road right of way and flare to a standard capture width of 4200mm gently guiding the herps towards the CSP entrance. Multiple eco-passages can be joined with walls in a saw tooth pattern within the

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right of way or the walls can be extended as required and where allowed into adjoining properties. An outward projecting flange on the top of wall stops tree frogs and other climbers and stiffens the wall for tie back. Heavy wire tie backs connect the wall to a geo grid in the compacted soil behind the wall. Soil is graded and vegetated to top of wall for road safety and highway maintenance requirements.



ELEVATION FROGWALL ECO-PASSAGE

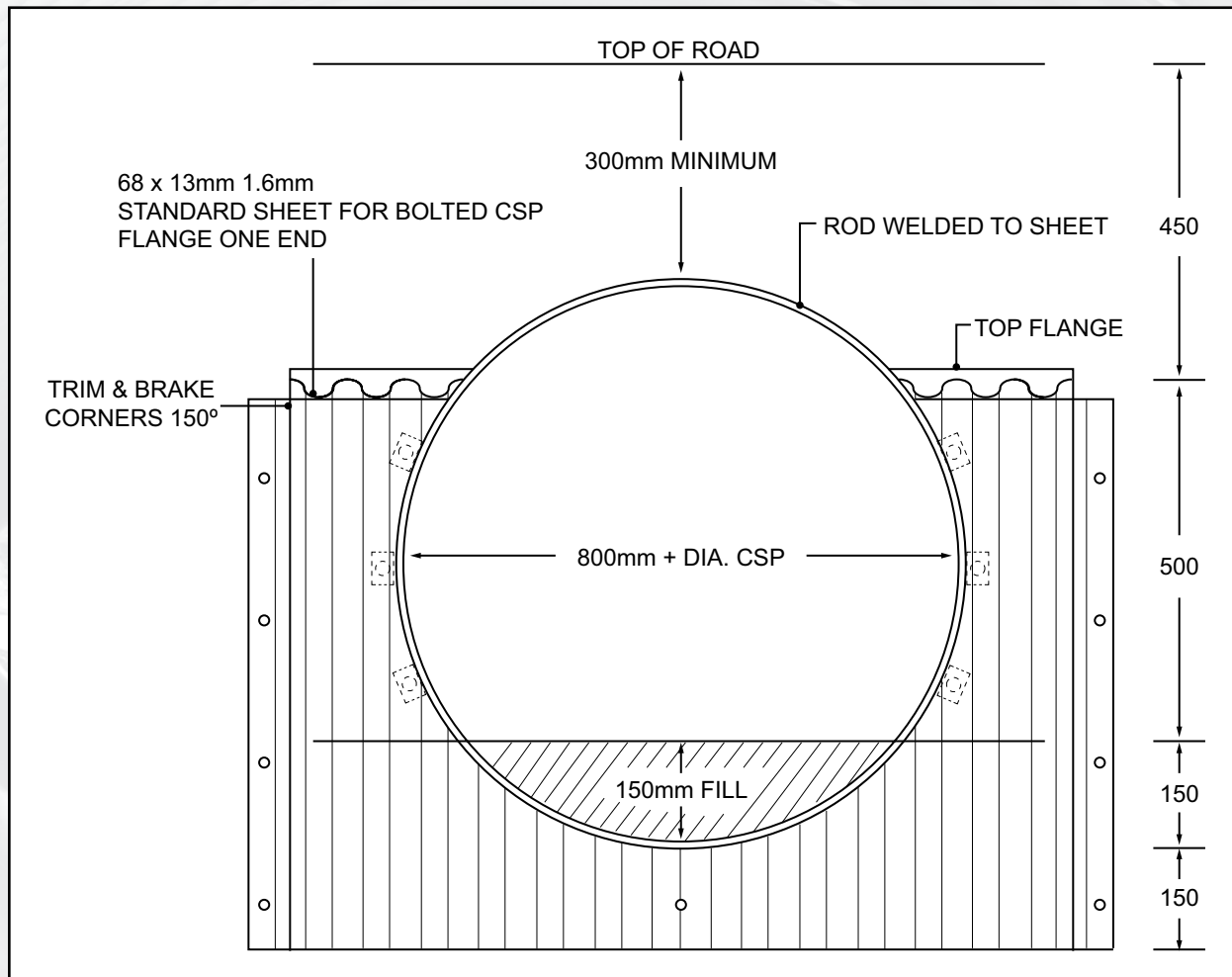
Material Selection

In many environments galvanized CSP will provide the most cost effective eco-passage. Its light coloured reflective surface will help to maximize natural lighting. Aluminized Type 2 CSP offers similar reflective qualities and performs well in the soft acidic water environments common to many herp communities. Polymer laminated CSP performs well in a variety of environments and is black in colour which contributes to a darker interior setting that some herp species are known to favour. (Ref: CSPI Performance Guidelines for material selection)

Availability and Constructability

The “Near Perfect Herpetofauna Eco-Passage” is manufactured with standard CSP materials that are available, economical, widely accepted, understood and approved for use across Canada. Open bottom steel box culverts and arches are available for eco-passages in every size required.

Taking Road Kill Out of the Cycle of Life Equation



END ELEVATION FROGWALL ECO-PASSAGE